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Wishing our authors and readers a peaceful and prosperous 2020

Koala receiving medical care, Wildlife Hospital, Brisbane, Australia

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This is the last issue this year and is rich with papers from the Region covering the main issues of concern in primary health care from prevention to treatment to screening. At the end of the year we wish to thank all our authors, readers and supporters and of course we cannot forget the publishing and production team working hard to meet deadlines.

A number of papers dealt with pregnancy issues. Al-Shareef O.K et al, carried a cross-sectional study on 410 from general population in Jeddah city. The aim was to assess the awareness about complications of SCD during pregnancy. The authors found that overall Knowledge about SCD and its complications during pregnancy was moderate. So, they recommend health education programs about all aspects of SCD should be designed, implemented and evaluated among general populations. Whereas Sharef A.A et al did a Retrospective Case control study was done in Azadi teaching Hospital in Iraq looking at Vitamin D3 deficiency and early pregnancy loss. The total sample show that 186 (79.2%) were covered lady, 182(85.8%) with vit D3 deficiency, 16(7.5%) with insufficiency, and 14(6.6%) had normal level of Vit D3. The authors concluded that Vitamin D deficiency was associated with early pregnancy loss. Sufficient vitamin D is important for healthy pregnancy

Al-Ahmadi M.T et al, describe the current state of abortion training at current active centers where there is Saudi board training program for Obstetrics and Gynecology in Jeddah, Saudi Arabia. The authors concluded that from the previous results that training of abortion is variable as there are some residents who had no training and others consider such training is optional and others consider it routine in addition most of the residents performed abortion (13-17weeks) more than 50 times. Wheras Alnemari B.A et al, a cross-sectional study was conducted at the post-natal clinics of maternity hospital of king Faisal medical complex to evaluate obstetric violence in Saudi maternal healthcare settings. The authors concluded that non-dignified care was experienced by women during pregnancy as invasive procedure and medication were unnecessary used, confidentiality was breached, faced physical violence to considerable extent and pregnant women need were neglected.

AL Blooshi et al did a cross-sectional study was conducted in 2017 using a questionnaire to measure breast cancer screening awareness. Six primary healthcare centers within 40 km of Abu Dhabi were included. Participants were 383 women aged 40–65 years. The authors concluded that primary care providers often have the first contact with women and should utilize this opportunity to spread awareness. Social media and public service campaigns can also be employed, and free mammograms could be offered to lower-income women.

A number of papers dealt with health education, Alhomood M.A et al, conducted a cross-sectional study among 385 parents of T1DM children attending the Diabetes Center in Abha City. The authors concluded that Parents' knowledge about DKA is suboptimal. They recommend that health education to T1DM patients and their guardians should be fulfilled. It must cover information related to independent management of diabetes and diabetic ketoacidosis and how to identify symptoms of DKA. Whereas Hetaimish B et al, attempted to determine the prevalence of tobacco smoking and assess the awareness of musculoskeletal effects of smoking among undergraduate medical and health science students at Makkah region, Kingdom of Saudi Arabia (KSA). The authors concluded that there is a crucial need to indorse multi-disciplinary health education events at different age groups to prevent adolescent students smoking, or support smoking cessation program.

The issue of fever and antibiotic was raised. El-Gamal F et al, looked at the causes and clinical aspects of fever in patients visiting primary healthcare. Analyses of data derived from clinical presentation of 24,816 outpatient visits revealed that 5,285 visits (21.3%) were for fever. The authors concluded that fever is a common presenting symptom among outpatient visits. Respiratory tract infections are the commonest cause of fever. Primary health care physicians should pay more effort to health educate the people about prevention and control of Fever. This information will help the MOH planners to develop programs of organized, whole-population anticipatory care. Whereas El-Gamal, F et al, attempted to explore clinical aspects and drug prescription of acute respiratory infection in primary health care. Analyses of data of 1200 outpatient visits revealed that 313 visits (26.08%) were for acute respiratory infection. Antibiotics were unnecessary prescribed to 32.8% of acute bronchitis, 32.6% of pharyngitis, and 18.2% of cases with common cold/influenza. The authors concluded that their study adds to evidence that misuse of antibiotics, characterized by antibiotic overuse is widespread in the treatment of outpatient ARIs.

A review paper from Pakistan looked at Non-Alcoholic Fatty Liver Disease Epidemic in Pakistan: Status, Challenges and way forward. The author stressed that fatty liver disease is present in the country in epidemic proportion. There is unfortunately, lack of awareness with regards to its high prevalence and serious adverse health related consequences, among patients as well as health care providers. Therefore the author stress that Unless concerted measures are taken now, we will be faced with an overwhelming disease burden that our health care delivery system with limited resources will be unable to control.

Mansour A.E et al tried to identify lifestyle diseases and associated risk behaviors among medical students, to find the association between the risk behaviors and gender of the student. Self-administered questioner was completed by all students. A total of 279 (56.0%) out of 507 medical students participated in the study of which 44.1% is male and 55.9% is female. The authors concluded that unhealthy lifestyle disease risk behavior is prevalent among medical students. There is will need to regular health education program to change in students' health behavior and students should be motivated to adapt healthy lifestyle practices.

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Knowledge, attitudes, and practices related to breast cancer screening among women visiting primary care centers in Abu Dhabi

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Abstract

Breast cancer is the most common type of cancer among women in the United Arab Emirates. Screening for breast cancer can reduce morbidity and mortality and improve women's survival rate. Low knowledge levels and poor practices related to breast cancer screening could be due to many factors; therefore, we assessed the knowledge, attitudes, and practices related to breast cancer screening of women visiting primary care centers in the Abu Dhabi region. A cross-sectional study was conducted in 2017 using a questionnaire to measure breast cancer screening awareness. Six primary healthcare centers within 40 km of Abu Dhabi were included. Participants were 383 women aged 40–65 years. Facilities that screen for breast cancer were underutilized by women. Although many women had a high knowledge of breast cancer (45.7%), they were not obtaining mammograms regularly (52.2%). Compared to their counterparts, women with higher education, employment, and a family history of breast cancer had significantly better knowledge (Ps < .001, .018, and .013, respectively), while women aged > 49 years followed better practice of obtaining mammograms (P < .001). Women who visited clinics inside Abu Dhabi island had better knowledge and practices than did those visiting clinics outside the island, while the opposite was true concerning attitudes. Education level, age, and region played a role in women's knowledge, attitudes, and practices related to breast cancer screening. Primary care providers often have the first contact with women and should utilize this opportunity to spread awareness. Social media and public service campaigns can also be employed, and free mammograms could be offered to lower-income women. Disseminating awareness about screening will also reduce the burden of breast cancer treatment on national healthcare systems. Research should be done on the degree of utilization of mammograms and the impact of screening on the healthcare system.

Key words: breast cancer, screening, knowledge, attitudes, practice, Abu Dhabi

Introduction

Breast cancer is a major health burden worldwide, impacting 2.1 million women annually, and is a leading cause of death among women. “In 2018, it was estimated that 627,000 women died from breast cancer; that is approximately 15% of all cancer deaths among women” [1]. According to the International Agency for Research on Cancer, “Among females, breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death, followed by colorectal and lung cancer (for incidence), and vice versa (for mortality); cervical cancer ranks fourth for both incidence and mortality” [2].

Globally, breast cancer incidence and mortality are expected to increase by 50% between 2002 and 2020. The highest incidence remains in the developed world; however, incidence rates are increasing in other areas of the world [3]. Incidence rates vary globally, ranging from 91.6 per 100,000 women in North America to 43 per 100,000 in the Middle East and Northern Africa [2].

Breast cancer remains a major public health threat among women in the Arab world, with the United Arab Emirates (UAE) ranking seventh in the increase in incidence rate [4]. Further, breast cancer is the most common cancer and the leading cause of death among women in the UAE, according to a 2014 report released by the Department of Health in Abu Dhabi [4]. Breast cancer is also the second leading cause of death among women in Abu Dhabi, comprising 20.3% of the five most common cancers in 2014 [5–7].

The impact of breast cancer can be reduced through various practices including performing breast self-examinations, undergoing clinical breast examinations, and obtaining mammograms. The UAE government has made great efforts in promoting early cancer detection through various health authorities. The Health Authority of Abu Dhabi established a breast cancer screening program in 2008. Despite this, screening rates have not yet reached ideal levels.

A recent study conducted in 2014 in Al Ain, UAE showed that a lack of knowledge about breast cancer is not the only reason for the delay in early presentation; other factors such as personal, social, and cultural issues also contribute to the delay [8]. Furthermore, a 2010 study conducted in Dubai, UAE revealed insufficient breast cancer screening practices among local women, in addition to a lack of awareness of the common risk factors and signs and symptoms of breast cancer [8].

No other studies have assessed the impact of breast cancer screening in Abu Dhabi. Therefore, we measured the knowledge level, attitudes, and practices related to breast cancer screening of women visiting primary healthcare centers in Abu Dhabi, UAE.

Materials and methods

Study design and participants

This cross-sectional study was conducted among women visiting six primary healthcare clinics in Abu Dhabi; Al Bateen, Zafaranah, Rowda, Maqta, Mohammed Bin Zayed, and Baniyas, between August 2016 and August 2017 using a self- administered questionnaire.

The target population was women aged 40–65 years who visited primary care centers within 40 km of Abu Dhabi, regardless of their nationality. Stratified random sampling was used to calculate the sample size for each clinic. We excluded women who were non-Abu Dhabi residents, non-English or non-Arabic speaking individuals, and women who had a personal history of breast cancer. Monthly income was subjectively reported by participants as being sufficient, sufficient and saving, or insufficient.

The estimated target population size was 168,286 women,aged 40–65 years,based on the 2015 statistical yearbook of Abu Dhabi [3]. The sample size (N = 383) was calculated using an online sample size calculator (Newcombe formula) using a 95% confidence interval and a 5% margin of error. At each clinic, questionnaires were distributed to women who met the inclusion and exclusion criteria, using a stratified random collection, until the required numbers were attained.

Study instrument and ethical approval

Arabic and English versions of the questionnaire were developed, which were adapted from a validated questionnaire used in a study similar to ours in Dubai City [9]. The questionnaire was revised to meet our objectives by modifying some of the questions (S1 Appendix). The self-administered questionnaire contained 102 questions and was divided into four parts that addressed participants’ sociodemographic characteristics (17 questions) breast cancer screening knowledge (28 questions), attitudes (5 questions), and practices (7 questions). A scale scoring system was used to categorize knowledge, attitudes, and practices as follows: knowledge = good (19–27 points), fair (9–18 points), or poor (0–8 points); attitudes = positive (4 points), neutral (2–3 points), or negative (0–1 points); and practices = good (2 points) or bad (0–1 points).

Questions intended to assess breast cancer screening knowledge included risk factors of breast cancer, age group with the highest risk for cancer, symptoms of breast cancer, different methods of screening, and how frequently the method needs to be repeated. Questions intended to assess attitudes toward mammogram screening and opinions about mammograms asked about their importance for early detection, increased anxiety, ease of performing, and whether they should be performed regularly. Questions intended to assess breast cancer screening practices asked about women’s practice and frequency of obtaining mammograms. Obtaining mammograms every 2 years was considered good practice.

Informed consent forms were attached to each questionnaire for the participants to read and sign if they were willing to participate. Questionnaires and consent forms were drafted in English and Arabic. A pilot study was conducted after ethical approval was granted from Ambulatory Healthcare Services Research Committee in Al Ain City to assess the comprehensibility of the questionnaire. Twenty questionnaires were distributed among women who visited primary care centers and met our criteria, and modifications were made to the questionnaire to meet our aim accordingly.

Data collection

Questionnaires were printed and then proportionally distributed to the six primary healthcare clinics in Abu Dhabi. The charge nurses at these health centers were briefed regarding the questionnaire and given training regarding participants' anonymity and informed consent. The charge nurse at each clinic was asked to distribute the questionnaires randomly to patients who matched the inclusion criteria. After completion, the nurses collected and sealed the questionnaires in envelopes to ensure participants' confidentiality. After the end of the study period, the charge nurse was asked to return the completed questionnaires to the authors.

Data analyses

After collection of the questionnaires, the obtained data were organized using Microsoft Excel, and coded and analyzed using SPSS version 18. Means and standard deviations were used for numerical data, and percentages for categorical data. First, chi-squared ($\chi 2$) tests were conducted to assess the effect of various factors on breast cancer screening knowledge, attitudes, and practices. Factors analyzed in this study included age, education, employment status, marital status, monthly income, menopause history, age of menopause, family history of breast cancer, age at first pregnancy, details of living children, and breastfeeding practice.

Results

Participants' demographic characteristics

A total of 383 questionnaires were distributed. Participants' demographics are displayed in Table 1.

Breast cancer screening knowledge

Table 2 shows the percentages of correctly answered questions regarding knowledge of breast cancer screening among the participating women. Overall, 45.7% had good knowledge about breast cancer screening, 48.8% had fair knowledge, and 5.5% had poor knowledge. Additional details are provided below.

Factors affecting breast cancer screening knowledge

Table 3 shows that, as women's education level increased, their level of knowledge regarding breast cancer significantly improved. Moreover, better breast cancer screening knowledge was found among women who were employed and those who had a family history of breast cancer, than did their counterparts. Women who had good or fair knowledge were found to have better attitudes and practices regarding breast cancer screening than those with poor knowledge.

Table 1: Participants' sociodemographic characteristics

	n	%
Age (years; n = 378)		
40–48	222	58.7
49–58	113	29.9
59–65	43	11.4
Nationality (n = 378)		
Local	205	54.2
Non-local	173	45.8
Education (n = 380)		
Primary or less	94	24.7
Secondary	115	30.3
University or above	171	45.0
Employment status (n = 371)		
Employed	167	45.0
Unemployed	204	55.0
Marital status (n = 371)		
Single	35	9.20
Married	287	75.5
Divorced/widowed	58	15.3
Monthly income (n = 357)		
Sufficient and saving	45	12.6
Sufficient	250	70
Insufficient	62	17.4

Table 2: Breast cancer screening knowledge of women visiting primary care centers in Abu Dhabi (N = 383)

	No. of correct answers	% of correct answers
Most common cancer among women	371	96.8
Risk factors of breast cancer		
Breast cancer is not related to age.	241	62.9
Breast cancer is not related to size of breast.	324	84.6
Having a first-degree relative with breast cancer increases one's risk.	304	79.4
Stress is not a risk factor.	208	54.3
Using Hormone Replacement Therapy increases the risk.	154	40.2
Breastfeeding reduces the risk.	351	91.6
Early menarche increases the risk.	38	9.90
Symptoms of breast cancer		
Bloody discharge from nipple	195	50.9
Painless mass	305	79.6
Pelvic pain is not a symptom.	328	85.6
Absence of period is not a symptom.	313	81.7
Nipple retraction	165	43.1
Breast cancer screening methods		
Breast self-examination	259	67.6
Clinical breast examination	195	50.9
Mammogram	289	75.5
Ultrasound is not a screening method.	268	70.0
Magnetic Resonance Imaging is not a screening method.	330	86.2
Computed Tomography is not a screening method.	327	85.4
Breast self-examinations should be done once a month.	161	42.0
Self-examinations should be done at the end of menses.	190	49.6
Mammograms can detect breast cancer early.	312	81.5
Mammograms should be done every two years.	155	40.5
Groups that must regularly obtain mammograms		
All women aged > 40 years	299	78.1
Women with a family history of breast cancer	219	57.2
Women with a personal history of breast cancer	124	32.4
Women aged ≥ 18 years should not obtain regular mammograms	314	82.0
Participants' overall knowledge		
Good	175	45.7
Fair	187	48.8
Poor	21	5.5
Participants' sources of information about breast cancer screening		
Television or radio	119	31.1
Magazine or brochure	119	31.1
Hospital doctor	104	27.2
Primary healthcare provider	157	41
Other	56	14.6

Table 3: Factors affecting breast cancer screening knowledge

Variable	Good	Fair	Poor	P
	n (%)	n (%)	n (%)	
Age (years; n = 378)				
40–48	109 (49.1)	102 (45.9)	11 (5.0)	.393
49–58	47 (41.6)	57 (50.4)	9 (8.0)	
59–65	18 (41.9)	24 (55.8)	1 (2.3)	
Education (n = 380)				
Primary or less	25 (26.6)	62 (66.0)	7 (7.4)	< .001
Secondary	48 (41.7)	59 (51.3)	8 (7.0)	
University or above	102 (59.5)	63 (36.8)	6 (3.7)	
Employment status (n = 371)				
Employed	90 (53.9)	67 (40.1)	10 (6.0)	.018
Unemployed	82 (40.2)	112 (54.9)	10 (4.9)	
Marital status (n = 380)				
Single	13 (37.2)	20 (57.1)	2 (5.7)	.367
Married	137 (47.7)	133 (46.4)	17 (5.9)	
Divorced or widowed	24 (41.4)	33 (56.9)	1 (1.7)	
Monthly income (n = 374)				
Sufficient and saving	23 (51.1.)	19 (42.2)	3 (6.7)	.925
Sufficient	114 (45.6)	123 (49.2)	30 (5.3)	
Insufficient	28 (45.2)	30 (48.4)	4 (6.4)	
Menopause history (n = 343)				
Yes	66 (45.5)	72 (49.7)	7 (4.8)	.929
No	86 (43.4)	102 (51.5)	10 (5.1)	
Age of menopause (years; n = 147)				
< 50	36 (46.8)	38 (49.4)	3 (3.8)	.007
50–55	23 (41.8)	31 (56.4)	1(1.8)	
> 55	5 (45.5)	3 (27.3)	7 (27.2)	
Family history of breast cancer (n = 379)				
Yes	25 (67.6)	12 (32.4)	0 (0.0)	.013
No	149 (43.6)	172 (50.3)	21 (6.1)	
Age at first pregnancy (years; n = 326)				
< 30	113 (44.1)	132 (51.6)	11 (4.3)	.191
≥ 30	37 (52.9)	28 (40.0)	5 (7.1)	
Have living children (n = 356)				
Yes	156 (46.7)	161 (48.1)	17 (5.2)	.530
No	8 (36.4)	12 (54.5)	2 (9.1)	
Breastfed children (n = 345)				
Yes	141 (45.6)	152 (49.2)	16 (5.20)	.609
No	14 (38.9)	19 (52.8)	3 (8.30)	
Attitudes toward breast cancer screening (n = 383)				
Positive	65 (63.1)	37 (35.9)	1 (1.00)	< .001
Neutral	90 (41.3)	118 (54.1)	10 (4.60)	
Negative	20 (32.3)	32 (51.6)	10 (16.1)	
Obtain mammograms regularly (n = 383)				.025
Good	94 (52.2)	80 (44.4)	6 (3.40)	
Bad	81 (39.9)	107 (52.7)	15 (7.40)	

Breast cancer screening attitudes

Table 4 shows participants' attitudes toward breast cancer screening. Approximately one-quarter held positive attitudes about breast cancer screening, while most held neutral attitudes.

Table 4: Breast cancer screening attitudes of women visiting primary care centers in Abu Dhabi (N = 383).

	n	%
Screening is important for early detection.	349	91.1
Screening is a painful procedure.	101	30.6
Screening should be done regularly.	302	78.9
Screening is easy to perform	234	74.1
Screening is associated with increased anxiety	144	37.6
Overall attitude		
Positive	103	26.9
Neutral	218	56.9
Negative	62	16.2

Factors affecting breast cancer screening attitudes

Table 5 shows that older women held better attitudes toward breast cancer screening than did their younger counterparts. Positive breast cancer screening attitudes were also found among women who were unemployed, had living children, and breastfed their children. Women who held positive and neutral attitudes were found to have better practices regarding breast cancer screening than those with negative attitudes.

Table 5: Factors affecting women's breast cancer screening attitudes

Variable	Positive	Neutral	Negative	P
	n (%)	n (%)	n (%)	
Age (years; n = 378)				
40–48	61 (27.5)	118 (53.2)	43 (19.3)	.016
49–58	24 (21.2)	75 (66.4)	14 (12.4)	
59–65	18 (41.9)	22 (51.1)	3 (7.0)	
Education (n = 380)				
Primary or less	28 (29.8)	56 (59.6)	10 (10.6)	.591
Secondary	30 (26.1)	64 (55.7)	21 (18.2)	
University or above	45 (26.3)	96 (56.1)	30 (17.6)	
Employment Status (n = 371)				
Employed	39 (23.4)	93 (55.6)	35 (21.0)	.017
Unemployed	63 (30.9)	119 (58.3)	22 (10.8)	
Marital Status (n = 344)				
Single	7 (20.0)	20 (57.1)	8 (22.9)	.540
Married	79 (27.5)	126 (56.4)	46 (16.1)	
Divorced/widowed	17 (29.3)	35 (60.3)	6 (10.4)	
Monthly income (n = 357)				
Sufficient and saving	13 (28.0)	26 (57.8)	6 (13.3)	.990
Sufficient	70 (28.0)	141 (56.4)	39 (15.6)	
Insufficient	16 (25.8)	36 (58.1)	10 (16.1)	
Underwent menopause (n = 343)				
Yes	35 (24.1)	91 (62.8)	19 (13.1)	.437
No	54 (27.3)	111 (56.1)	33 (16.6)	
Age of menopause (years; n = 145)				
< 50	19 (24.7)	48 (62.3)	10 (13.0)	.299
50–55	17 (30.9)	30 (54.5)	8 (14.6)	
> 55	0 (00.0)	9 (81.8)	2 (18.2)	
Family history of breast cancer (n = 379)				
Yes	12 (32.4)	23 (62.2)	2(5.40)	.180
No	91 (26.6)	193 (56.4)	58 (17.0)	
Age at first pregnancy (years; n = 326)				
< 30	80 (31.2)	139 (54.3)	37 (14.5)	.528
≥ 30	17 (24.3)	42 (60.0)	11 (15.7)	
Have living children (n = 356)				
Yes	98 (29.3)	185 (55.4)	51 (15.3)	.041
No	1 (4.5)	16 (72.7)	5 (22.8)	
Breastfed children (n = 345)				
Yes	93 (30.1)	169 (54.7)	47 (15.2)	.039
No	4 (11.1)	27 (75.0)	5 (13.9)	
Practices (n = 383)				
Good	63 (35.0)	99 (55.0)	18 (10.0)	< .001
Bad	40 (19.7)	119 (58.6)	44 (21.7)	

Breast cancer screening practices

Table 6 shows participants' breast cancer screening practices. Only about half had good practices and obtained mammograms. Additional details are provided in Table 6.

Table 6: Breast cancer screening practices of women visiting primary care centers in Abu Dhabi (N = 383)

	n	%
Practice breast self-examinations	222	59.7
Frequency of breast self-examinations		
Regularly	93	41.0
Monthly	56	24.7
Irregularly	78	34.4
Reasons for not practicing breast self-examinations		
Lack of knowledge	56	35.0
Fear of finding something abnormal	32	20.0
No risk	23	14.5
No time	25	15.6
Do not know	42	26.4
Other reasons	16	10.1
Practice clinical breast examinations	178	48.9
Frequency of clinical breast examinations		
Once a year	85	47.0
Once every 2–3 years	65	35.9
Once every > 5 years	31	17.1
Obtain mammograms	238	64.5
Mammogram frequency		
Once every 1–3 years	184	78.3
Once every 4–5 years	38	16.2
Once every ≥ 6 years	13	5.5.0
Overall practice of obtaining mammograms		
Good	180	47.0
Bad	203	53.0

Factors affecting breast cancer screening practices

Table 7 shows that older women had good practices regarding obtaining mammograms. Good breast cancer screening practices were also found among women who were married, post-menopausal, and had a family history of breast cancer.

Table 7: Factors affecting women's breast cancer screening practices

Variable	Good	Bad	P
	n (%)	n (%)	
Age (years; n = 378)			< .001
40–48	83 (37.4)	139 (62.6)	
49–58	71 (62.8)	42 (37.2)	
59–65	25 (58.1)	18 (41.9)	
Education (n = 380)			.728
Primary or less	47 (50.0)	47 (50.0)	
Secondary	55 (47.8)	60 (52.2)	
University or above	77 (45.0)	94 (55.0)	
Employment status (n = 371)			.377
Employed	75 (44.9)	92 (55.1)	
Unemployed	101 (49.5)	103 (50.5)	
Marital status (n = 380)			.006
Single	10 (28.6)	25 (71.4)	
Married	133 (46.3)	154 (53.7)	
Divorced/widowed	36 (62.1)	22 (37.9)	
Monthly income (n = 357)			.674
Sufficient and saving	22 (48.9)	23 (51.1)	
Sufficient	114 (45.6)	136 (54.4)	
Insufficient	32 (51.6)	30 (48.4)	
Menopause history (n = 343)			< .001
Yes	84 (57.9)	61 (42.1)	
No	77(38.9)	121 (61.1)	
Age of menopause (years; n = 143)			.292
< 50	43 (55.8)	34 (44.2)	
50–55	34 (61.8)	21 (38.2)	
> 55	4 (36.4)	7 (63.6)	
Family history of breast cancer (n = 379)			.024
Yes	24 (64.9)	13 (35.1)	
No	155 (45.3)	187 (54.7)	
Age at first pregnancy (years; n = 326)			.744
< 30	119 (46.5)	137 (53.5)	
≥ 30	31 (44.3)	39 (55.7)	
Have living children (n = 356)			.129
Yes	162 (48.5)	172 (51.5)	
No	7 (31.8)	15 (68.2)	
Breastfed children (n = 345)			.783
Yes	147 (47.6)	162 (52.4)	
No	18 (50.0)	18 (50.0)	

Knowledge, attitudes, and practices across primary care clinics in Abu Dhabi

When comparing clinics within and outside Abu Dhabi, the best knowledge level and breast cancer screening practices were found in Rowdah, followed by Zafrana and Al Bateen. However, the most positive attitudes were found in Baniyas, followed by Al Bateen and Maqta. These results were significant (Table 8).

Table 8: Knowledge, attitudes, and practices between primary care clinics in Abu Dhabi.

	Al Bateen	Rowdah	Zafrana	Maqta	MBZ[a]	Baniyas	P
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Overall knowledge							
Good	27 (47.3)	29 (63.0)	48 (50.5)	20 (37.0)	15 (28.3)	36 (46.2)	
Fair	29 (50.9)	16 (34.8)	38 (40.0)	34 (63.0)	30 (56.6)	40 (51.2)	< .001
Poor	1 (1.80)	1 (2.20)	9 (9.50)	0 (0.00)	8 (15.1)	2 (2.60)	
Overall attitudes							
Positive	20 (35.1)	10 (21.7)	16 (16.8)	14 (25.9)	5 (9.40)	38 (48.7)	
Neutral	28 (49.1)	30 (65.2)	58 (61.1)	30 (55.6)	34 (64.2)	38 (48.7)	< .001
Negative	9 (15.8)	6 (13.1)	21 (22.1)	10 (18.5)	14 (26.4)	2 (2.60)	
Overall practice of obtaining mammograms							
Good	29 (50.9)	30 (65.2)	52 (53.7)	26 (48.1)	17 (32.1)	27 (34.6)	003
Bad	28 (49.1)	16 (34.8)	44 (46.3)	28 (51.9)	36 (67.9)	51 (65.4)	

a. MBZ: Mohamed Ben Zayed

Recommendation

This study examined the knowledge, attitudes, and practices related to breast cancer screening among women in the Abu Dhabi region. We will compare our results with those of studies conducted in Ras Al Khaimah [10] and Al Ain, UAE [8] and Najran, Saudi Arabia [11].

The level of knowledge about breast cancer in our study was 45.7%, compared to 10.2% in Saudi Arabia and 5% in Al Ain. The higher percentage found in this study could be attributed to the fact that most women included were younger and had access to evidence-based medicine through the Internet. Another reason could be that women were influenced by social media or becoming more trusting of their primary care providers regarding health-related problems.

Surprisingly, we found a similar outcome as that of the Al Ain study regarding knowledge about risk factors of breast cancer. Our results showed that women knew that breast cancer is the most common cancer among women in the UAE and that breastfeeding is protective against breast cancer; however, they were not sure when mammograms should be obtained. Both our results and those of the Al Ain study showed that being younger and educated were associated with improved knowledge levels than were being older and less educated.

Our findings and those from Saudi Arabia showed that higher education level, being employed, and having a personal or family history of breast cancer had a significant impact on knowledge about breast cancer screening. The reason for this could be that primary care doctors are providing effective consultations. This is reflected in our findings, which showed that primary healthcare providers were the primary source of information for women in Abu Dhabi.

Social media also plays a role in spreading news about the importance of breast cancer screening. Findings from Saudi Arabia showed that most women get their information from social media (52.4%) and only 8.8% received it from a primary care doctor. Furthermore, in the Al Ain study, it was revealed that 38% women obtained their information from their healthcare provider. Moreover, public service campaigns in universities, schools, and communities can be employed to spread awareness of the importance of breast cancer screening.

On comparing those living on or around the island of Abu Dhabi, women living on the island were found to have the most knowledge. The reason for this could be that more campaigns about cancer occur on the island than in areas around it. Women who live around the island (rural places) are more likely to be homemakers and have less education.

This study showed that regardless of having access to free mammograms, there was a lack of knowledge and underutilization of the service. Similar results were found in the studies done in Al Ain and Saudi Arabia. In our study, 47% of the women were obtaining mammograms, as compared to 44.9% in the Al Ain study [8], 37.6% in the Ras Al Khaimah study [10], and 15% in the Saudi Arabia study [11]. The higher percentage than those of prior studies could be attributed to the awareness campaigns that are conducted by the UAE health authorities, and that free mammograms are offered from October to November (breast cancer awareness month) for women with insurance, which does not cover mammograms.

Although the current study revealed the highest rate of obtaining mammograms, overall, it was still considered to be poor. Reasons for this could include that some women do not feel comfortable being examined by doctors, and only seek medical advice when they discover something abnormal about their breasts, or are too busy.

Both our study and the one conducted in Al Ain showed that women aged 49 years or older were more likely to obtain mammograms than were their younger counterparts. Reasons for this could be that younger women think they are not the target for the screening program. Older women may also have chronic diseases that they seek medical advice for; consequently, their primary healthcare providers may offer mammograms more often simply because they see them more often.

When comparing between clinics, regions played an important role. Women located in Abu Dhabi had obtained mammograms more frequently than did those around Abu Dhabi. Perhaps women who live in the city tended to be more knowledgeable and aware of the importance of breast cancer screening than women around the city. Moreover, more campaigns are implemented in Abu Dhabi than around it.

Conclusion

In our study, we found that, despite having the modalities and services for breast cancer screening, women were still underutilizing these options. The participating women had a good knowledge about breast cancer but poor practice of obtaining mammograms. Education level, age, and region all played a key role in women's knowledge, attitudes, and practices related to breast cancer screening.

Primary care providers, who are often women's first point of contact, should help spread awareness concerning breast cancer screening. Strategies that can be implemented include utilizing social media, implementing more public service campaigns, and offering free mammograms to women who cannot afford to pay for them. Hopefully, these measures will also reduce the burden of breast cancer treatment on national healthcare systems.

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The safest upper limit of triglycerides in the plasma

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Abstract

Background: We tried to understand the safest upper limit of triglycerides in the plasma.

Methods: Patients with plasma triglycerides lower than 60 mg/dL were put into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL or greater into the fifth groups, respectively.

Results: The study included 875 cases (370 males). Although the mean age increased just up to plasma triglycerides value of 200 mg/dL, male ratio and smoking increased parallel to increased plasma triglycerides values, continuously. Interestingly, the most significant increase of smoking was seen just after plasma triglycerides value of 200 mg/dL, and there was no significant effect of aging or excess weight on this step. Mean body mass index was only normal in patients with plasma triglycerides values lower than 60 mg/dL. Although fasting plasma glucose (FPG), hypertension (HT), diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), and chronic renal disease (CRD) increased parallel to the increased plasma triglycerides continuously, low density lipoproteins (LDL), white coat hypertension (WCH), and coronary heart disease (CHD) increased just up to plasma triglycerides value of 200 mg/dL.

Conclusions: Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD were all deteriorated parallel to the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Interestingly, the greatest number of deteriorations were observed just above the plasma triglycerides value of 60 mg/dL.

Key words: Triglycerides, male gender, smoking, excess weight, early aging, premature death

Introduction

Chronic low-grade endothelial injury may be the most common type of vasculitis, and the leading cause of aging in human beings (1-4). Much higher blood pressure (BP) of the afferent vasculature may be the major underlying cause by inducing recurrent injuries on endothelium. Probably whole afferent vasculature including capillaries are mainly involved in the process. Thus the term of venosclerosis is not as famous as atherosclerosis in the literature. Secondary to the chronic low-grade endothelial injury, inflammation, edema, and fibrosis, vascular walls thicken, their lumens narrow, and they lose their elastic nature, all of which reduces blood supply to the end-organs, and increases systolic BP further. Some of the well-known underlying causes and indicators of the inflammatory process are physical inactivity, animal-rich diet, overweight, smoking, alcohol, hypertriglyceridemia, hyperbetalipoproteinemia, impaired fasting glucose, impaired glucose tolerance, white coat hypertension (WCH), cancers, prolonged infections such as tuberculosis, and chronic inflammations such as rheumatologic disorders (5, 6). Some of the irreversible consequences of the chronic low-grade inflammatory process include obesity, hypertension (HT), diabetes mellitus (DM), cirrhosis, peripheric artery disease (PAD), chronic obstructive pulmonary disease (COPD), chronic renal disease (CRD), coronary heart disease (CHD), mesenteric ischemia, osteoporosis, stroke, other end-organ insufficiencies, early aging, and premature death (7-9). Although early withdrawal of the underlying factors may delay terminal consequences, after development of cirrhosis, COPD, CRD, CHD, PAD, stroke, or early aging, endothelial destruction cannot be reversed effectively due to its fibrotic nature. The triggering etiologies and terminal consequences of the chronic low-grade inflammatory process are researched under the titles of metabolic syndrome, aging syndrome, or accelerated endothelial damage syndrome in the literature, extensively (10-13). Although its normal limits could not be determined clearly yet, high plasma triglycerides values may be significant indicators of the syndrome (14). Due to the significant association between high plasma triglycerides values and CHD, Adult Treatment Panel (ATP) III adopts lower cutpoints for triglycerides abnormalities than did ATP II (15, 16). Although ATP II determined the normal upper limit of triglycerides as 200 mg/dL in 1994, World Health Organisation in 1999 (17) and ATP III in 2001 reduced the normal upper limit as 150 mg/dL (16). Although these cutpoints are usually used to define borders of the metabolic syndrome, there are suspicions about the safest upper limit of the triglycerides in the plasma. We tried to understand the safest upper limit of plasma triglycerides according to some components of the metabolic syndrome in the present study.

Materials and Methods

The study was performed in the Internal Medicine Polyclinic of the Dumlupinar University between August 2005 and March 2007. Consecutive patients above the age of 15 years were studied. Their medical histories were learnt, and a routine check up procedure including fasting plasma glucose (FPG), serum creatinine, liver function tests, markers of hepatitis viruses A, B, C and human immunodeficiency virus, triglycerides, low density lipoproteins (LDL), high density lipoproteins (HDL), an electrocardiogram, and an abdominal ultrasonography were performed. A Doppler echocardiogram was performed just in required cases. Current daily smokers with six pack-months and cases with a history of three pack-years were accepted as smokers. Patients with devastating illnesses including type 1 DM, malignancies, hemodialysis, ascites, hyper- or hypothyroidism, and heart failure were excluded to avoid their possible effects on weight. Additionally, anti-hyperlipidemic drugs, metformin, and/or acarbose users were excluded to avoid their possible effects on blood lipid profiles or body weight (18, 19). Body mass index (BMI) of each case was calculated by the measurements of the same physician instead of verbal expressions. Weight in kilograms is divided by height in meters squared (16). Cases with an overnight FPG level of 126 mg/dL or greater on two occasions or already using antidiabetic medications were defined as diabetics (16). An oral glucose tolerance test with 75-gram glucose was performed in cases with a FPG level between 110 and 126 mg/dL, and diagnosis of cases with a 2-hour plasma glucose level of 200 mg/dL or greater is DM (16). CRD is diagnosed with a persistently elevated serum creatinine level of 1.3 mg/dL in males and 1.2 mg/dL in females. Additionally, office blood pressure (OBP) was checked after a 5-minute rest in seated position with a mercury sphygmomanometer on three visits, and no smoking was permitted during the previous 2 hour.s A 10-day twice daily measurement of blood pressure at home (HBP) was obtained in all cases after a 10 minute education session about proper BP measurement techniques (20). An additional 24 hour ambulatory blood pressure monitoring was not required due to its similar effectivity with the HBP measurements (3). Eventually, HT is defined as a mean BP of 135/85 mmHg or higher on HBP measurements, and WCH as an OBP of 140/90 mmHg or higher but a mean HBP measurement of lower than 135/85 mmHg (20). An exercise electrocardiogram was performed just in cases with an abnormal electrocardiogram and/or angina pectoris. Coronary angiography was taken just for the exercise electrocardiogram positive cases. So CHD is diagnosed either angiographically or with the Doppler echocardiographic findings as the already developed movement disorders in the cardiac walls. The spirometric pulmonary function tests were performed in required cases and the criterion for diagnosis of COPD is post-bronchodilator forced expiratory volume in one second/ forced vital capacity of less than 70% (21). Eventually, patients with plasma triglycerides values of lower than 60 mg/dL were put into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL or higher into the fifth groups, respectively. The mean age, male ratio, smoking, BMI, FPG, triglycerides, LDL, HDL, WCH, HT, DM, COPD, CHD, and CRD were detected in each group and compared in between. Mann-Whitney U test, Independent-Samples T test, and comparison of proportions were used as the methods of statistical analyses.

Results

The study included 875 patients (505 females and 370 males), totally. The mean values of plasma triglycerides were 51.0, 78.3, 122.2, 174.1, and 325.8 mg/dL in the five groups, respectively. The mean age increased just up to the plasma triglycerides value of 200 mg/dL, and there was an increase of triglycerides about 7.8 mg/dL for each year of aging. Whereas the male ratio increased parallel to the increased plasma triglycerides values, continuously (30.9% versus 51.2%, p<0.001). Beside that the mean BMI values were 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five groups, respectively. In other words, only the cases with the plasma triglycerides values lower than 60 mg/dL had a normal mean BMI value. Although FPG, HT, DM, COPD, and CRD increased parallel to the increased plasma triglycerides values continuously, LDL, WCH, and CHD increased just up to the plasma triglycerides value of 200 mg/dL. Interestingly, the mean HDL values were similar in all of the five groups (p>0.05 between all). Prevalence of smoking increased parallel to the increased plasma triglycerides values, continuously (16.6% versus 38.3%, p<0.001). Interestingly, the most significant increase of smoking was seen just after the plasma triglycerides value of 200 mg/dL, and there was no significant effect of aging or excess weight on this step. On the other hand, the greatest number of deteriorations (ten components, significantly) was observed during passage from the first into the second groups of the study cases. Whereas seven components deteriorated during passage from the second into the third groups, significantly. Although five components deteriorated during passage from the third into the fourth and from the fourth into the fifth groups, significantly, there was an additional improvement in the LDL values during the passage from the fourth into the fifth groups. Thus the number of deteriorations at this step was accepted as four (Table 1**).**

Discussion

Excess weight may be the most common cause of vasculitis worldwide, and the leading cause of major health problems in this century. It leads to structural and functional abnormalities in many organ systems of the body (22). Adipose tissue produces leptin, tumor necrosis factor-alpha, plasminogen activator inhibitor-1, and adiponectin-like cytokines, all of which behave as acute phase reactants in the plasma (23). Excess weight-induced chronic low-grade vascular endothelial inflammation may play a significant role in the pathophysiology of accelerated atherosclerotic process in the whole body (1, 2). On the other hand, excess weight may cause an increased blood volume as well as an increased cardiac output thought to be the result of an increased oxygen need of the excessive fat tissue. The prolonged increase in the blood volume may lead to myocardial hypertrophy, terminating with a decreased cardiac compliance. Beside that FPG and total cholesterol values increased parallel to the increased BMI (24). Combination of these cardiovascular risk factors will eventually terminate with an increase in left ventricular stroke work and higher risks of arrhythmias, cardiac failure, and sudden cardiac death. Similarly, the prevalence of CHD and stroke increased parallel to the increased BMI values in another study (25), and risk of death from all causes including cancers increased throughout the range of moderate to severe weight excess in all age groups (26). The relationships between excess weight, increased BP, and higher plasma triglycerides values are described in the metabolic syndrome, extensively (14), and clinical manifestations of the syndrome include obesity, hypertriglyceridemia, hyperbetalipoproteinemia, HT, insulin resistance, and proinflammatory and prothrombotic states (12). Similarly, prevalence of smoking (42.2% versus 28.4%, p<0.01), excess weight (83.6% versus 70.6%, p<0.01), DM (16.3% versus 10.3%, p<0.05), and HT (23.2% versus 11.2%, p<0.001) were all higher in the hypertriglyceridemia group in another study (27). On the other hand, the prevalence of hyperbetalipoproteinemia was similar both in the hypertriglyceridemia (200 mg/dL or greater) and control groups (18.9% versus 16.3%, p>0.05, respectively) in the above study (27). Similarly, plasma LDL values increased just up to the plasma triglycerides value of 200 mg/dL but no more in the present study. Beside that, the mean BMI values increased just up to the plasma triglycerides value of 150 mg/dL, significantly (p<0.05 for each step). In our opinion, although excess weight does not affect each individual with the same severity, overweight, obesity, severe obesity, and morbid obesity histories of years should be added into the calendar age with various degrees during calculation of physiological age of the individuals.

Smoking and alcohol may be the second and third most common causes of vasculitis, respectively. According to our experience, both of them should be included into the major components of the metabolic syndrome since they cause chronic inflammation on the vascular endothelium, terminating with an accelerated atherosclerotic process all over the body. Smoking's destructive effects are particularly prominent in the respiratory tract and lungs, probably due to the highest concentrations of toxic substances found in the cigarette smoke. The strong and irreversible atherosclerotic effects of smoking are most clearly detected in Buerger's disease. It is an obliterative vasculitis characterized by inflammatory changes in the small and medium-sized arteries and veins, and it has never been reported in the absence of smoking in the literature. Eventually, the atherosclerotic effects terminate with early aging, end-organ insufficiencies, and premature death. According to our clinical observations, although smoking does not affect each individual with the same severity, the smoking history of pack-years should be added into the calendar age during calculation of physiological age of the patients. Probably, alcohol gives harm to vascular endothelium in similar ways with smoking but alcohol's main targets are the gastrointestinal tract and liver due to the highest concentrations of alcohol and its products there. Thus the drinking history of drink-years should also be added into the calendar age during calculation of physiological age of the patients. Due to the very low prevalence of alcoholism in Turkey (28), we did not include regular alcohol intake

Table 1: Characteristics features of the study cases according to the plasma triglycerides values

Variable	Lower than 60 mg/dL	p-value	Lower than 100 mg/dL	p-value	Lower than 150 mg/dL	p-value	Lower than 200 mg/dL	p-value	200 mg/dL or greater
Number of cases	84		207		235		148		201
Age (year)	*35.6 ± 16.4 (17-79)*	*0.000*	*43.6 ± 17.5 (16-83)*	*0.009*	*47.7 ± 15.3 (16-82)*	*0.018*	*51.2 ± 12.6 (19-82)*	Ns*	49.8 ± 12.3 (19-88)
Male ratio	*30.9%*	*0.05>*	*39.1%*	Ns	*40.4%*	Ns	*43.9%*	*0.05>*	*51.2%*
Smoking	*16.6%*	Ns	*21.7%*	Ns	*26.3%*	Ns	23.6%	*0.001>*	*38.3%*
BMI† (kg/m²)	*24.6 ± 5.3 (16.7-45.9)*	*0.002*	*27.1 ± 5.9 (16.7-49.3)*	*0.000*	*29.4 ± 6.1 (18.4-51.0)*	Ns	*29.9 ± 4.8 (19.2-49.0)*	Ns	*30.0 ± 5.0 (21.0-51.1)*
FPG‡ (mg/dL)	*96.5 ± 35.3 (71-377)*	*0.016*	*106.6 ± 42.7 (56-490)*	Ns	*106.8 ± 35.1 (71-335)*	*0.006*	*117.3 ± 47.8 (68-386)*	Ns	*124.3 ± 55.3 (74-392)*
Triglycerides (mg/dL)	*51.0 ± 7.5 (27-59)*	*0.000*	*78.3 ± 10.8 (60-99)*	*0.000*	*122.2 ± 14.5 (100-149)*	*0.000*	*174.1 ± 14.2 (150-199)*	*0.000*	*325.8 ± 160.4 (200-1.350)*
LDL§ (mg/dL)	*98.6 ± 23.3 (56-161)*	*0.000*	*114.6 ± 33.0 (31-269)*	*0.000*	*131.1 ± 31.7 (56-228)*	*0.033*	*137.5 ± 32.4 (50-237)*	*0.020*	*129.0 ± 40.8 (10-239)*
HDL‖ (mg/dL)	44.9 ± 12.3 (24-77)	Ns	48.8 ± 11.6 (33-91)	Ns	46.4 ± 10.5 (27-80)	Ns	43.7 ± 9.0 (22-67)	Ns	43.1 ± 9.1 (25-70)
*WCH***	*17.8%*	*0.05>*	*24.1%*	*0.05>*	*31.0%*	Ns	*35.1%*	Ns	32.3%
*HT****	*8.3%*	*0.001>*	*15.9%*	*0.05>*	*21.2%*	Ns	*22.2%*	Ns	*26.3%*
*DM*****	*2.3%*	*0.001>*	*11.1%*	Ns	*13.6%*	Ns	*18.2%*	*0.05>*	*24.3%*
*COPD******	*4.7%*	*0.01>*	*9.1%*	*0.01>*	*14.0%*	Ns	12.8%	*0.05>*	*18.4%*
*CHD*******	*4.7%*	*0.001>*	*10.1%*	Ns	*11.4%*	Ns	*14.8%*	Ns	11.9%
*CRD********	0.0%	Ns	1.9%	Ns	*0.4%*	*0.01>*	*2.0%*	*0.01>*	*4.9%*
Numbers of deteriorations		*10*		*7*		*5*		*4*	

*Nonsignificant (p>0.05) †Body mass index ‡Fasting plasma glucose §Low density lipoproteins
‖High density lipoproteins **White coat hypertension ***Hypertension ****Diabetes mellitus
*****Chronic obstructive pulmonary disease ******Coronary heart disease *******Chronic renal disease

into the present study. On the other hand, although alcoholic drinks provide extra calories for body, smoking in humans and nicotine administration in animals may be associated with a decreased BMI (29). Evidence revealed an increased energy expenditure during smoking both on rest and light physical activity (30), and nicotine supplied by patch after smoking cessation decreased caloric intake in a dose-related manner (31). According to an animal study, nicotine may lengthen intermeal time, and simultaneously decrease amount of meal eaten (32). Additionally, BMI seems to be the highest in former and lowest in current smokers (33). Smoking may be associated with a postcessation weight gain (34). Similarly, although CHD was detected with similar prevalence in both genders in a previous study (35), prevalence of smoking and COPD was higher in males against the higher BMI, LDL, triglycerides, WCH, HT, and DM in females. This result may indicate both the strong atherosclerotic and weight decreasing roles of smoking (36). Similarly, the incidence of myocardial infarction is increased six-fold in women and three-fold in men who smoke 20 cigarettes per day (37). In another definition, smoking may be more dangerous for women probably due to the higher BMI and its consequences. Parallel to the above results, the proportion of smokers is consistently higher in men in the literature (19). So smoking is probably a powerful atherosclerotic risk factor with some suppressor effects on appetite. Smoking-induced appetite loss may be related with the smoking-induced severe vascular endothelial inflammation in whole body, since loss of appetite is one of the major symptoms of disseminated inflammation in the body. Physicians can even understand healing of patients by means of normalizing appetite. Several toxic substances found in the cigarette smoke get into the circulation by means of the respiratory tract and lungs, and cause a severe vascular endothelial inflammation in whole body until its clearance from the circulation. But due to the repeated smoking habit of the individuals, the clearance never terminates. So the patients become ill with loss of appetite, permanently. In another explanation, smoking-induced weight loss is an indicator of being ill instead of being healthy (31-33). After smoking cessation, appetite normalizes with a prominent weight gain but the returned weight is the patients' physiological weight, actually.

Although the obvious consequences of excess weight on health, nearly three-quarters of cases above the age of 30 years have excess weight (38). The prevalence of excess weight increases by decades, particularly after the third decade, up to the eighth decade of life (38). So 30th and 70th years of age may be the breaking points of life for weight, and aging may be the major determiner factor of excess weight. Probably, partially decreased physical and mental stresses after the age of 30 years, and debility and comorbid disorders-induced restrictions after the age of 70 years may be the major causes for the changes of BMI at these ages. Interestingly, the mean age and BMI increased just up to the plasma triglycerides values of 200 mg/dL and 150 mg/dL in the present study, respectively. So smoking remained as the major causative factor for the hypertriglyceridemia above the plasma triglycerides value of 200 mg/dL. Beside that, the mean BMI values were 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five study groups, respectively. In other words, only cases with the plasma triglycerides values lower than 60 mg/dL had a normal mean BMI. On the other hand, the mean age and triglycerides of the first group were 35.6 years and 51.0 mg/dL, respectively. They were 43.6 years and 78.3 mg/dL in the second, 47.7 years and 122.2 mg/dL in the third, and 51.2 years and 174.1 mg/dL in the fourth groups, respectively. In another definition, the triglycerides values increased about 7.8 mg/dL for each year of aging up to 200 mg/dL in the plasma. So aging alone may be another risk factor for chronic low-grade inflammation on vascular endothelium in the whole body.

Although ATP III reduced the normal upper limit of plasma triglycerides as 150 mg/dL in 2001 (16), whether or not much lower limits provide some additional benefits for the human body is unclear (39). Similar to a recent study (40), prevalence of smoking was the highest in the highest triglycerides having group in the present study and that may also indicate the inflammatory role of smoking in the metabolic syndrome, since triglycerides may behave as acute phase reactants in the plasma. FPG, BMI, HT, DM, COPD, and CRD increased parallel to the plasma triglycerides values from the first up to the fifth groups, continuously, in the present study. As one of our opinions, significantly increased mean age by the increased plasma triglycerides values may be secondary to aging-induced decreased physical and mental stresses, which eventually terminates with excess weight and its consequences. Interestingly, although the mean age increased from the lowest triglycerides having group up to the triglycerides value of 200 mg/dL, it then decreased. The similar trend was also seen with the mean LDL values. These trends may be due to the fact that although the borderline high triglycerides values (150-199 mg/dL) are seen together with physical inactivity and overweight, the high triglycerides (200-499 mg/dL) and very high triglycerides values (500 mg/dL or higher) may be secondary to genetic factors, smoking, and irreversible consequences of the metabolic syndrome including obesity, DM, HT, COPD, cirrhosis, CRD, PAD, CHD, and stroke (16). But although the underlying causes of the high and very high plasma triglycerides values may be a little bit different, probably risks of the terminal endpoints of the metabolic syndrome do not change in them. For example, prevalence of HT, DM, and COPD were the highest in the highest triglycerides having group in the present study. Eventually, although some authors reported that lipid assessment can be simplified by measurements of total cholesterol (41), the present study and most of the others indicated a causal relationship between higher triglycerides and irreversible end-points of the metabolic syndrome (42).

As a conclusion, plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis. There may be significant associations between male gender, smoking, aging, excess weight, and plasma triglycerides values. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD all deteriorated parallel to

the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Interestingly, the greatest number of deteriorations was observed just above the plasma triglycerides value of 60 mg/dL in the present study.

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(Editorial continued)

are aware of the harmful effects of some of the Traditional medicaments, there is a need to raise the knowledge and awareness regarding use of TEM and self medicaments for eye problems.

Thawabeh A.N et al, present a case of non-keratinizing undifferentiation nasopharyngeal cancer who had cisplatin chemotherapy. They presented a 56 years old male admitted to Al-Hada emergency department complaining of diffuse severe abdominal pain associated with nausea at the onset of the pain and constipation one day ago. In this study, thromboembolic events (TEEs) occurred within the first 100 days of starting cisplatin. TEE prophylaxis is advisable for patients receiving cisplatin-based chemotherapy.

Helvaci M.R et al tried to understand the safest upper limit of triglycerides in the plasma. The authors concluded that Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD were all deteriorated parallel to the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Interestingly, the greatest number of deteriorations was observed just above the plasma triglycerides value of 60 mg/dL.

Khan M et al, performed an observational cross-sectional study on 400 healthcare workers in health care facilities in Saudi Arabia. The aim of the study is do assessment of the knowledge and compliance of healthcare workers among safety precautions in health care facilities. The tool used in this study was self-administrated questionnaire divided into three sectors: (1) socio demographic, (2) knowledge about concept of standard precautions, its measures and when used, (3) Practice of standard precautions. The authors concluded that more than half of our participants had sufficient knowledge and practice regarding standard precautions.

Alkhayat, M.A et al, aimed to assess the satisfaction of patients who have undergone bariatric surgery in the city of Taif. The authors follow an online survey using a Post-Bariatric Satisfaction Questionnaire was used to collect responses from patients. The authors concluded that satisfaction from bariatric surgery was not only effective in a reduction in weight loss but also has found to affect in reducing co-morbidities which drastically improved the quality of life. Patients should be made aware of the benefits and the limitations of these types of surgeries in morbid obesity management.

Jajah, M.B et al, carried cross-sectional observational study on 347 type 2 diabetic patients who were using the drug 'metformin' for at least six months. The study aimed to assess the prevalence of vitamin B12 deficiency in patients with Type 2 diabetes mellitus (T2DM) on metformin. The prevalence of vitamin B12 deficiency among participants was 10.4%. Patients with borderline levels were about 20.2% and remaining 69.5% had normal vitamin B12 levels. The authors concluded that vitamin B12 supplementation should be prescribed for diabetic patients to prevent the occurrence of vitamin B12 deficiency complications.

Bossei A et al, conducted a cross-sectional survey to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals. Participant sample size was 354 students, selected through convenience sampling. The Finkelstein test showed positive results (67%, n=238) when done on students. The authors concluded that De-Quervain's tenosynovitis is a critical cause of hand dysfunction for health care providers. Further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under-documented cause of tendinopathy.

Murshid S.J et al, carried an an analytic cross-sectional study of 83 post-cardiac surgery Saudi patients looking at the quality of life. The authors concluded that post-cardiac surgery Saudi patients had an accepted HRQoL months after their surgery that could deteriorate later with their advancing age. They recommend

Causes and clinical aspects of fever in patients visiting primary healthcare

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Abstract

Objective: A better understanding of fever is important for effective management of illness in all ages. In this study, we explored the spectrum of causes and clinical aspects of fever in primary healthcare.

Results: Analyses of data derived from clinical presentations of 24,816 outpatient visits revealed that 5,285 visits (21.3%) were for fever. Half the patients with fever were children under 15 years old (50%), particularly among those under five (40.5%). Fever was more common among males (58.3%). The majority of patients presenting with fever (84.0%) were for respiratory tract disorders (upper = 62.4%, and lower=21.6%). Half of the patients with fever (50.0%) needed investigations to conclude the diagnosis. The majority of patients with fever were prescribed antimicrobial treatment (63%). Only 1.8% needed referral for further care, and counseling about the disease was almost neglected (.8%).

Thus the results revealed that fever is a common presenting symptom among outpatient visits. Respiratory tract infections are the commonest cause of fever. Primary health care physicians should pay more effort to educate the people about prevention and control of fever. This information will help the MOH planners to develop programs of organized, whole-population anticipatory care.

Key words: Fever, outpatient visits, respiratory tract infection

Introduction

People from all age groups are affected by fever. The age of the affected individual may also increase the intensity of manifestations associated with fever (1). Fever may be caused by any type of non-infectious or infectious etiologies, cancer, or even drug intake (2, 3). A high temperature and other clinical symptoms may indicate several serious illnesses or medical conditions. While the fever is a beneficial defense mechanism against infections, treating it does not worsen the outcome (4). Fever is the most common reason for consultations especially in the developing countries (5, 6). It is the cause of about 30% of healthcare visits by children and around 75% of adults with sickness (7). Approximately 5% of people who visit the emergency room have fever (8). Fever is common in intensive care, affecting around 70 % of the patients (9). Very few studies have been done on the epidemiology of fever in the health care centers (10 – 12). Thus the objective of this study was to assess the spectrum of causes of fever, and its clinical aspects in patients visiting outpatient clinics in primary healthcare.

Materials and methods

Design: A cross sectional study was undertaken
Setting: Outpatient clinics of two general hospitals; one in a relatively high socio-economic standard region, and the other in a relatively lower socio-economic standard region.

Sampling: The sampling technique was convenience type, and the total number of patients examined was 24,816 during a two year period (2017 – 2018).

Collection of data: Data were collected on the patients by specialists in the outpatient clinics, which included clinical history, anthropometric and vital signs assessments, clinical assessment (which included physical examination, diagnosis, investigations and management), and outcome of the visits.

Data analysis and statistical tests: Data were analyzed using the Statistical Package for Social Sciences (IBM SPSS, version 22, Armonk, NY: IBM Corp.). Chi square test of significance was employed. The level of significance for the study was 0.05.

Results

Out of the 24,816 outpatient clinic visits 5,285 visits (21.3%) presented with fever. Half the patients with fever were children under 15 years old (50%), with the highest frequency among children under 5 years of age (40.5%). Among 5285 patients with fever, males (58.3%: 3082/5285) were more common than females (41.7%: 2203/5285). Fever was significantly more common among patients from the Southern region compared to patients from the northern one (22.1 and 20.7% respectively). The majority of patients with fever (84.0%) visited outpatient clinics because of respiratory tract disorders (URTI= 62.4%, and LRTI=21.6%). Half of the patients with fever (50.0%) needed investigations to conclude the diagnosis. The majority of patients with fever needed antibiotics (63%), while one third needed symptomatic treatment (35%). Referral was done for very few cases (1.8%), while counseling about the diseases was almost neglected (.8%). A large proportion of patients presenting with fever to the outpatient clinics were encountered among those aged 1 – 5 years old (44%).These differences were statistically significant ($p < 0.05$). Among 5,285 oupatient visits, fever was significantly more encountered among females (23%: 2203/9742) compared to males (20%: 3092/15,074). Fever was more encountered among those residing in a LSE area (23%) compared to those living in a HSE area (21%). A large proportion of patients with fever didn't need investigation (27%); while 23% needed routine investigations and special investigations were ordered for 14% of the patients. The proportion of patients who presented with fever and who were admitted to hospital was 22.7% and those who were discharged (21.2%) were similar (Table 1) . Among all outpatient visits the majority of infectious diseases presented with fever (89.2%), followed by URTI (62.6%) and LRTI (30.3%). Table 2 shows the LRT disorders which presented with fever in the outpatient visits. The majority of cases with pertussis and croup (76% and 79% respectively) presented with fever. Almost half of the cases with bronchopneumonia and pneumonia (55.2% and 43% respectively) presented with fever. About one third of patients with Tuberculosis and bronchitis (35% and 33% respectively) presented with fever. These differences were statistically significant where $p < 0.000$. Table 3 displays the URT disorders that presented with fever. Influenza, tonsillitis and pharyngitis were the most common disorders that presented with fever (79%, 74% and 69% respectively). Common cold and OM were also commonly presented with fever to the PHC facilities (47% and 42% respectively). This difference was statistically significant where $p < 0.000$. Fever of unknown etiology accounted for 0.8%, dengue fever accounted for 0.59% and malaria accounted for 0.09%. Among all cases with fever, dengue fever accounted for 2.01%, while malaria accounted for 0.28%, while undiagnosed fever accounted for 3.8%.

Table 1: The Relationship between personal and environment characteristics and clinical aspects of all patients presenting with fever

Variables	Fever				Chi Square (p)
	Yes		No		
	Number	%	Number	%	
Age groups					
< 1 year	480	32.2%	1013	67.8%	
1 - 4 years	1177	44.0%	1501	56.0%	1780.979
> 5 to 14 years	994	33.5%	1971	66.5%	(< 0.000)
> 15 to 49 years	2363	16.9%	11628	83.1%	
> 50 years to 64 years	231	07.7%	2774	92.3%	
> 65 years	40	05.8%	644	94.2%	
Gender					
- Male	3082	20.4%	11992	79.6%	16.589
- Female	2203	22.6%	7539	77.4%	(< 0.000)
District					
- High socioeconomic status	3018	20.7%	11540	79.3%	6.728
- Low socioeconomic status	2267	22.1%	7991	77.9%	(< 0.009)
Investigation					
- No investigation	2646	27.0%	7148	73.0%	469.231
- Routine	1373	22.6%	4706	77.4%	(< 0.000)
- Specific	1266	14.2%	7677	85.8%	
Management					
-Symptomatic	6510	78.0%	1841	22.0%	176.9
-Therapeutic	11508	77.7%	3304	22.3%	(< 0.000)
-Counselling	469	92.0%	41	8.0%	
-Referral	1044	91.5%	97	8.5%	
Outcome					
- Discharged	4758	21.2%	17733	78.8%	2.872
- Admitted	527	22.7%	1798	77.3%	(< 0.090)

Table 2: Fever presentation among outpatient visits due to Lower respiratory disorders

Variables	Fever				Chi Square (p)
	Yes		NO		
	Number	%	Number	%	
- Acute respiratory failure	0	00.0%	2	100.0%	
- Asthma	154	14.6%	898	085.4%	
- Asphyxia	0	00.0%	1	100.0%	
- Bronchiectasis	0	00.0%	15	100.0%	
- Bronchiolitis	9	24.3%	28	075.7%	
- Bronchitis	586	32.8%	1199	067.2%	
- Broncho pneumonia	219	55.2%	178	044.8%	
- Cancer lung	0	00.0%	1	100.0%	
- COPD	3	12.5%	21	087.5%	
- Croup	58	79.5%	15	020.5%	
- DIPF	0	00.0%	1	100.0%	
- Hemothorax	0	00.0%	2	100.0%	
- Haemoptysis	0	00.0%	1	100.0%	407.870
- Pertussis	19	76.0%	6	024.0%	(< 0.00)
- Pleural effusion	0	00.0%	6	100.0%	
- Pleurisy	0	00.0%	26	100.0%	
- Pneumonia	84	42.9%	112	057.1%	
- Pneumothorax	0	00.0%	15	100.0%	
- Pulmonary oedema	1	06.3%	15	093.8%	
- Pulmonary embolism	0	00.0%	7	100.0%	
- Recurrent laryngeal nerve injury.	0	00.0%	1	100.0%	
- Respiratory distress syndrome	0	00.0%	4	100.0%	
- TB	7	35.0%	13	065.0%	

Table 3: Fever presentation among outpatient visits due to upper respiratory tract disorders

Variables	Fever				Chi Square (p)
	Yes		No		
	Number	%	Number	%	
-Allergic Rhinitis	32	18.8%	138	081.2%	
- Allergic sinusitis	11	18.3%	49	081.7%	
- Common cold	296	46.6%	339	053.4%	
- Epiglottitis	0	00.0%	14	100.0%	
- Epistaxis	1	16.7%	5	083.3%	
- Influenza	115	78.8%	31	021.2%	581.561
- OM	124	42.2%	170	057.8%	(< 0.00)
- Otitis externa	0	00.0%	22	100.0%	
- Pharyngitis	2153	69.5%	946	030.5%	
- Tonsillitis	564	74.0%	198	026.0%	
- Vertigo	3	05.1%	56	094.9%	

Discussion

Fever is the most common reason for visiting primary health care facilities in developing countries. However, still very few studies have been done to determine the epidemiology of fever in the health care centers (10, 11). To increase efficiencies and reduce costs, the government in KSA has actively explored private sector involvement in the development of the healthcare infrastructure in the Kingdom. About one third of the hospital-based services (33.05%) in KSA are conducted by the private sector. (12) Thus, the present study aimed at exploring the causes of fever and its clinical pattern among a large number of patients (24,816) visiting outpatient clinics of private hospitals in Jeddah, Saudi Arabia. In the present study the symptom of fever was encountered among 21.3% of all the visits. This is in line with previous studies which revealed that fever was the most common reason for consultations especially in the developing countries (5, 6, 13, 14). The symptom of fever in young children is one of the most common clinical signs managed by healthcare providers and is a frequent cause of parental concern. Fever in children may prove to be a diagnostic challenge as it is often difficult to identify the cause. In the present study 50% of the patients who showed fever were children under the age of 15; and those under 5 years old were most affected (40.5%). This is consistent with the findings reported by previous studies (13 – 16).

In the present study, fever was more common among males compared to females (58.3% and 41.7% respectively). This is in line with a study conducted by Salvi et al in India (13). On the other hand several previous studies revealed that a greater number of female patients visited the health care center with fever as a symptom compared to males (15, 17, 18). This has been attributed to social factors by other authors as males, in contrast to females, predominantly work outdoors and women are more likely to be covered due to the conservative Saudi dress code (19).

In the present study 84.0% of the patients with fever suffered from acute respiratory tract infection (ARTI). The upper respiratory tract infection accounted for 62.4% of the cases while LRTI accounted for 21.6%. This was in line with previous studies (10, 13, 15).

The present study revealed that among patients with fever 12.5% suffered from COPD. As these infections contribute considerably to the clinical course of the patient with COPD, they constitute a significant comorbidity in COPD. Recurrent acute infections by bacterial and/or viral pathogens are now clearly linked with the occurrence of exacerbations of COPD (20). Respiratory viral infections can have a significant influence on those patients with established asthma, where viral respiratory infections are found in association with asthma exacerbations in nearly 80% of these episodes (12). In the present study, 14.7% of the patients with fever had bronchial asthma.

The primary symptoms of croup are a “barking cough” and hoarseness and difficulty of breathing. Most children develop a fever, which may range from mild (38°C) to very high (40.5°C). In the present study fever was present in the majority of patients with croup (79.5%).

The incidence of pertussis has been greatly reduced by massive vaccination. Nevertheless, there is a significant increase in pertussis cases in older children, adolescents and adult people (22,23). In the present study fever was present in the majority of patients with pertussis (76%).

Pneumonia is the leading cause of death due to infection worldwide in children aged <5 years, and is responsible for approximately 16% of the 5.6 million deaths in a previous study (24). In the present study fever was encountered among 55.2% of children with bronchopneumonia and among 42.9% of cases with lobar pneumonia. An acute bronchitis patient presents with a productive cough, malaise, difficulty breathing, and wheezing. A low-grade fever may be present as well (25).

Moreover, in this study fever was present in only 32.8% of the patients with acute bronchitis. Thus, in the presence of fever the health care provider should examine the child or young adult carefully for the presence of pneumonia. Even in absence of fever, physicians should be suspicious about pneumonia and acute bronchitis when other symptoms like cough or difficulty of breathing present.

Dengue has been suggested to be the most important arthropod-borne viral infection of humans. It is endemic in Saudi Arabia; the presence of dengue in western coastal areas of Saudi Arabia and throughout the region of Makkah is clearly documented (2, 27). In the present study Dengue fever accounted for 0.9% of the total cases; fever was present in the majority of cases (74.1%). It was much higher than cases of malaria. The burden of malaria infection has been reduced over the past decades in many countries. In Saudi Arabia, malaria is confined to the southwestern parts of the country (28). Malaria was constrained mostly to foci in Aseer and Jazan regions (28). In the present study malaria accounted for 0.08% of the total cases; the majority of malaria cases presenting with fever (68.2 %).

Because of the recently developed advancement in diagnostic methods, true FUO is now much lower and uncommon in some developed countries. Fever of unknown etiology or origin (FUO) accounted for 0.8% of the total cases in the present study and constituted 3.8% of cases with fever, which is in line with other studies (29, 30). On the other hand, studies from France and India reported higher figures (17,18).

In the present study, the investigations were ordered for half of the patients with fever in order to fully conclude the diagnosis. This is in line with a previous study (17).

Excessive prescribing of antibiotics remains an important driver of antimicrobial resistance. The bulk of antibiotic prescribing occurs in primary care, with acute respiratory tract infections (ARTIs) representing the most common indication (31). In the present study, also, the majority of patients with fever (63%) received antibiotics. Although

ARTIs are often self-limiting and seldom require antibiotics for treatment, primary care clinicians have been found to overprescribe for a variety of clinical and, predominantly, non-clinical factors (32). The percentage of undiagnosed patients in this study was high which led to the low percentage of referrals (1.8%) and neglected counseling for the patients (0.8%). Thus, fever is a common presenting symptom among outpatient visits to private hospitals. It is particularly common among under 5 years old children particularly in low socioeconomic areas. Respiratory tract infections are the commonest cause of fever among outpatient visits in private hospitals. Patients visiting the primary health care facilities with fever may probably have respiratory infections, and the occurrence of respiratory infections may be much more common in the region of Saudi Arabia. Further studies are needed to determine the burden of respiratory infections in patients with fever in different regions of the kingdom. Primary health care physicians should pay more effort to educate the people about prevention and control of fever. This information will help the MOH planners to develop programs of organized, whole-population anticipatory care.

Limitations of this study

This study was based on a convenient sample so its generalizability is questioned. However, a large number of patients were studied, which makes this research a reliable exploratory study.

Ethical considerations

Ethical clearance was obtained from the institutional review board (IRB). Permission was obtained from the directors of the outpatient clinics for collecting data on the outpatient visits. In order to keep confidentiality of any information provided by study participants, the data collection procedure was anonymous.

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Lifestyle diseases and associated risk behaviours among medical students in Saudi Arabia

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Abstract

Background: Lifestyle-related risk factors contribute to more than two thirds of Non-Communicable Diseases. They are responsible for the development of various metabolic diseases such as hypertension, diabetes and obesity. Medical students are exposed to various lifestyle related disease risk factors.

Objectives: To identify lifestyle diseases and associated risk behaviors among medical students, to find the association between the risk behaviors and gender of the student.

Materials and Methods: A cross sectional study was conducted at Unaizah College of Medicine. All medical students were included in our study. A self-administered questionnaire was completed by all students. Written consent was obtained. The data were collected and analyzed using SPSS.

Results: A total of 279 (56.0%) out of 507 medical students participated in the study of which 44.1% were male and 55.9% female. 66.7 % of medical students were not doing daily exercise; 74.2% of them were watching TV and computer and 53.4 % were skipping breakfast. On the other hand, 24.7 % of students never eat fruits daily, 15.1% are smokers and 72.0% have stressors with no significant difference between males and females ($P < 0.05$). Only 8.2% of students eat fast food every day and 71% of them are sleeping less than 8 hours per day with more significance among males than females ($P<0.05$).

Conclusion: Unhealthy lifestyle disease risk behavior is prevalent among medical students. There is a need to undertake a regular health education program to change students' health behavior and students should be motivated to adopt healthy lifestyle practices.

Key words: lifestyle disease, Risk behavior, Nutrition, Physical activity, Habits.

Introduction

Lifestyle diseases especially overweight and obesity are among the most neglected diseases which are continually increasing in the world, and affect all ages, sexes, and ethnicities. Lifestyle disease is classified as the fifth leading cause of mortality all over the world (1,2). It causes potent risk factors for cardiovascular disease and type 2 diabetes and is considered as the major cause of premature deaths (3). Obesity is defined as abnormal or excessive fat accumulation that may impair health. The body mass index (BMI) is a simple index of weight for height and is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m2). A person with a BMI of 25 or more is considered by WHO to be overweight, while obesity is defined as having a BMI of 30 or more (4). In 2016 a study was conducted as a national survey to examine obesity and its associated factors in KSA; and in the process, interviewed 10,735 individuals aged 15 years and older. The research collected data regarding physical activities, diet, health-related behaviors and habits, socio-demographics characteristics, anthropometric measurements, use and access to healthcare, and chronic diseases of the respondents using computer assisted personal interviews. The results revealed that 28.7% of the total respondents were obese, with a BMI greater than 30 kg/m2, which was more prevalent among women (33.5%) than men (24.1%) (5).\5 Another study discussed current trends and future projections of adult obesity prevalence. The research forecasts that the overall obesity will increase to 41% in men and 78% in women by 2022 in Saudi Arabia (6).

Medical education is stressful throughout the course of studying and training. The amount of material to be absorbed, living far away from family, social isolation, pressure of examinations, all can be anticipated to bring psychological stress (7). However, stress will remain part and parcel of the life of every medical student, which cannot be modified at college level. Other modifiable factors such as increased fast food consumption, increased soft drinks, watching television and playing games on the computer and lack of outdoor games are more important from the prevention point of view 8 College can play a significant role in encouraging healthy behavior in students.

On the other hand, chronic stress may also trigger physiological processes which lead to weight loss, (9) in particular, among individuals for whom chronic work stress is associated with suppressed appetite and increased physical activity (10). Stress may contribute to changes in dietary behaviors that lead to weight change, with various effects related to sex, (11,12) baseline body mass index (13) or cortisol reactivity in response to stress (14,15). These factors may cause some people to gain more weight under stressful circumstances, while others may even lose weight when stressed (16, 17). All these factors do not contribute positively to the development of healthy lifestyles. Research related to these risk factors among medical students is essential, considering their role as future physicians and as a role model in public health intervention programs (18)

There are few studies on lifestyle diseases risk behavior among medical college students in Saudi Arabia. Therefore, this study was undertaken to identify lifestyle diseases and associated risk behaviors among students in Unaizah College of Medicine to find out the association between life style diseases and risk behaviors among students in a medical college. We also aimed to discover the association between the risk behaviors and gender of the students in medical college.

Material and methods

Study design:
Quantitative observational Cross sectional study was conducted through the academic year 2017-2018.

Sampling technique and size:
The Study was conducted in Unaizah College of Medicine campus at Qassim University. All medical students (male and female) from the first year Premed2 to the final year MD4 were included in our study as a representative sample of all medical students in the Kingdom of Saudi Arabia. We excluded any student who refused to participate in our study.

Methods of Data collection:
A self-administered questionnaire was completed by all students at Unaizah College of Medicine which included personal data of student, questions related to dietary behaviors, physical behaviors, smoking behaviors, stressors; then BMI was measured for all participants, and data entered and analyzed using computer program (SPSS version 24).

Statistical analysis:
The data was entered, organized, tabulated and analyzed using the standard computer program SPSS version 24.0. Qualitative data was expressed as frequency and percent. Chi square (x2) was used to assess the relationship between the qualitative variable and odd ratio was estimated for detection of risk factors with the significant level set at p-value < 0.05.

Results

A total of 279 (56.0 %) out of 507 medical students participated in the study of which 44.0% were male and 56.0% female. Table 1 shows that the majority of students were aged between 22 and 24 years. Most of them (79.6%) wer living with both father and mother. The majority of students were in the academic years MD1 and MD3. On the other hand most mothers were educated in upper secondary schools (60.2%) and fathers haduniversity education (45.2%). About (35.5%) of students had a family income more than 20000 SR.

Table 2 reveals that 66.3 % of medical students are not doing regular daily exercise, 74.2% of them watch TV and computers and 53.4 % are skipping breakfast. On the other hand 24.7 % of students are never eating fruits daily, 15.1 % are smokers and 72.0% of students have stressors. Only 8.2% of students are eating fast food every day and 18.6% are never eating vegetables daily and 71% of them are sleeping less than 8 hours per day.

Table 3 shows that there is no significant difference between male and female students regarding doing regular daily exercise, watching TV and computer and skipping breakfast, never eating fruits daily, smoking and having stressors ($p > 0.05$). There is a significant difference among males more than females regarding eating fast food every day, never eating vegetables daily and sleeping less than 8 hours per day

Figure 1 shows that the percentage of female students is higher than males (56%) and Figure 2 shows that the majority of students are eating vegetables and fruits daily (81.4 & 75.3 respectively) and most of them are sleeping less than 8 hours and have stressors (71.0% & 72.0% respectively) but the minority are eating fast foods (8.2%).

Table 1: Distribution of students regarding socio-demographic data

Socio-demographic data	No	Percent
Age per years		
- 18-<20	2	0.7
- 20-<22	127	45.5
- 22-<24	113	40.5
- >24	37	13.3
Academic year		
- Premed	43	15.4
- MD1	70	25.1
- MD2	61	21.9
- MD3	69	24.7
- MD4	36	12.9
Living with parents:		
- Both mother & father	222	79.6
- Father only	4	1.4
- Mother only	29	10.4
- Neither	24	8.6
Mother education:		
- No formal education	15	5.4
- Primary education	40	14.3
- Lower secondary education	44	15.8
- Upper secondary education	168	60.2
- University education	12	4.3
Father education:		
- No formal education	13	4.7
- Primary education	31	11.1
- Lower secondary education	25	9.0
- Upper secondary education	84	30.1
- University education	126	45.2
Family income per SR.		
- < 7000 SR	21	7.5
- 7000- 12000 SR	81	29.0
- 12500- 17000 SR	43	15.4
- 17500- 20000 SR	36	12.9
- >20000 SR	98	35.1
Total	279	100.0

Table 2: Frequency of behaviors among students

Behaviors		Frequency	Percent
Doing exercise	Yes	94	33.7
	No	185	66.3
Watching TV/Computer >2 hours daily	Yes	72	25.8
	No	207	74.2
Skipping breakfast	Yes	149	53.4
	No	130	46.6
Eating fruits daily	Yes	210	75.3
	No	69	24.7
Eating vegetables daily	Yes	227	81.4
	No	52	18.6
Eating fast foods	Yes	23	8.2
	No	256	91.8
Smoking	Yes	42	15.1
	No	137	84.9
Having stressors	Yes	201	72.0
	No	78	28.0
Sleeping <8 hours daily	Yes	198	71.0
	No	81	29.0
Total		279	100.0

Table 3: Association between sex and lifestyle disease risk behaviors

	Risk Behaviors	Males (%) N= 123	Females (%) N= 156	Chi square Value	P value
1	Inadequate exercise regularly	75(61.0)	110(70.5)	2.80	0.094
2	>2 hours watching TV / Computer	97(78.9)	110(70.5)	2.50	0.114
3	Skipping breakfast	70(56.9)	79(50.6)	1.09	0.29
4	Never eating fruits daily	37(30.1)	32(20.5)	3.38	0.07
5	Never eating vegetables daily	36(29.3)	16(10.3)	16.34	0.00*
6	Eating fast foods daily	16(13.0)	7(4.5)	6.60	0.01*
7	Smoking daily	21(17.1)	21(13.5)	0.702	0.40
8	Having stressors in your life	92(74.8)	109(69.9)	0.828	0.36
9	Sleeping < 8 hours daily	96(78.0)	102(65.4)	5.35	0.02*

Figure 1: Frequency of male and female students

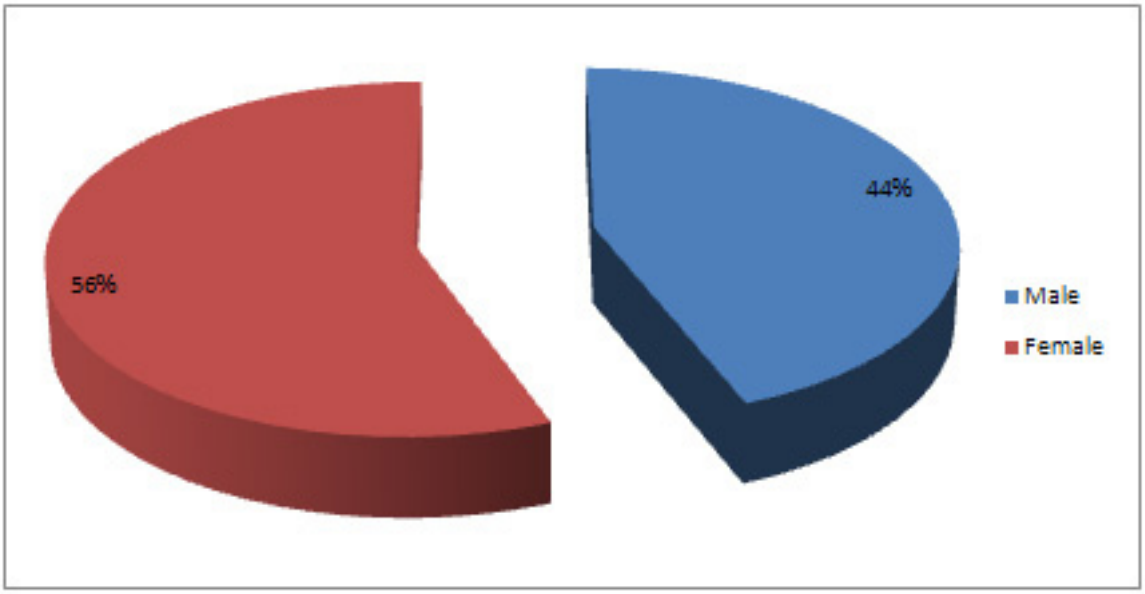
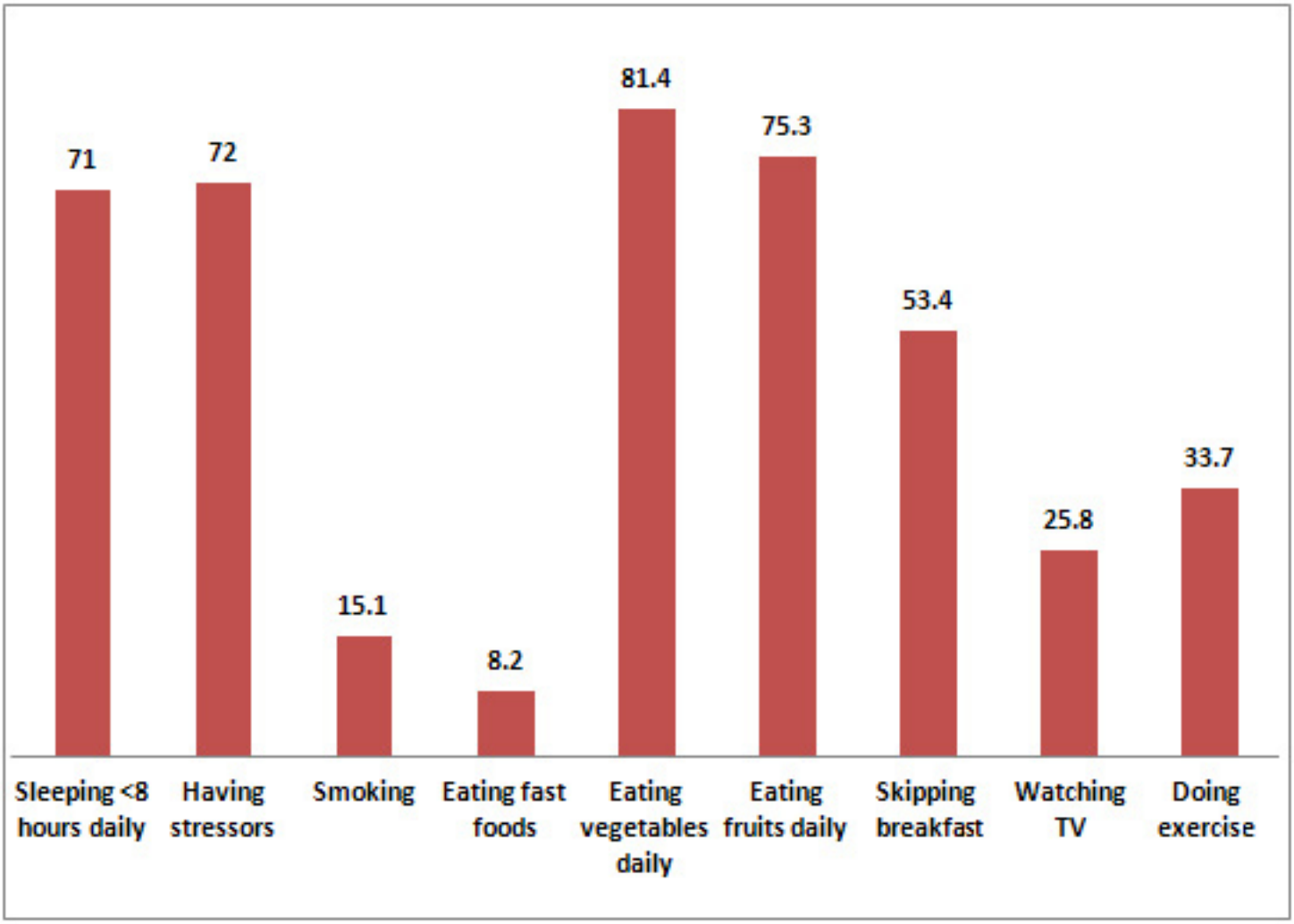


Figure 2: Frequency of behaviors among students



Discussion

This study was conducted to identify lifestyle diseases and associated risk behaviors among medical students, to find the association between the risk behaviors and gender of the student. A total of 279 (56.0 %) out of 507 medical students participated in the study of which 44.0% were male and 56.0% female. The majority of students are aged between 22 and 24 years. Most of them (79.6%) live with both father and mother. The majority of students are in the academic years MD1 and MD3. Most of their mothers are educated in upper secondary schools (60.2%) and fathers have university education (45.2%). Also about (35.5%) of students have a family income more than 20000 SR.

This study showed (in Table 1) that 66.7 % of medical students are not doing daily regular exercise, and this is due to the culture of our country where most people depends on cars for their daily activities and this result comes into line with other studies done in India (Meenal, 2016.) (20) and (Rustagi et al, 2011) (19) . Also the present study revealed that 74.2% of students are watching TV and computer and this is greater than the results in another study conducted in India (Meenal, 2016)(20). and (Paul B,et al 2015) (21). Their results showed less than our study and this may be due to our students having a more sedentary life. On the other hand our study showed that 53.4 % of the students are skipping breakfast and this comes in accordance with another study done India that showed that skipping breakfast is common. (Meenal, 2016) (20).

The present study revealed that 24.7 % of students are never eating fruits daily, and this is in concordance with another study conducted in Delhi which showed nearly the same results (Rustagi et al, 2011) (19) . Also our study showed that only 15.1 % of the students are smokers and this agrees with another study which reported the same results. The majority of the students 72.0% were having stressors with no significant difference between males and females ($p > 0.05$). Only 8.2% of students in our study are eating fast food every day and this is less than another study conducted by (Rustagi et al, 2011) (19) that reported a high prevalence of eating fast food.

The present study revealed that only 18.6% of students are never eating vegetables daily and this agrees with the study conducted by (Paul B, et al 2015) (21) which showed the same results. On the other hand this study showed that 71% of the students are sleeping less than 8 hours per day which is significant among males than females and this agrees with astudy conducted in Egypt which revealed the same results (Abdolfotoh MA, et alt ,2007) (22) and disagrees with the study conducted by (Meenal, 2016) (20_. which reported less results.

Limitation:
There were no limitations for this study

Conclusion

Unhealthy lifestyle disease risk behavior is prevalent among medical students. There is need for a regular health education program to change students' health behavior and students should be motivated to adapt healthy lifestyle practices. There was no significant difference between genders in most risk behaviors.

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There are no conflicts of interest

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Causes and management of acute respiratory infections in primary health care

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Abstract

Objective: To explore clinical aspects and drug prescription of acute respiratory infection in primary health care.

Results: Analyses of data of 1,200 outpatient visits revealed that 313 visits (26.08%) were for acute respiratory infection. Over half the patients with acute respiratory infections were children under 15 years old (56.5%), particularly among those under five (36.1%). It was more common in males (65.5%) compared to females (34.5%). Upper and lower respiratory infections were almost equal (50.8% and 49.2% respectively). Acute bronchitis (37.1%) and pharyngitis (28.4%) were the most common presenting diseases. Pneumonia (9.3%), acute tonsillitis (8.3%), common cold (7%), and otitis media (5.4%) were also reported. While pharyngitis was the most common disease in those under 15 years old, acute bronchitis was the most frequent respiratory disease in those older than 45 years old. Fever (63.9%) and cough (61.3%) were the most common presenting symptoms. Antibiotics (37.1%) and analgesics (26.2%) were the most common drugs prescribed to patients with acute respiratory infection. Antibiotics were unnecessarily prescribed to 32.8% of acute bronchitis, 32.6% of pharyngitis, and 18.2% of cases with common cold/influenza. Our study adds to evidence that misuse of antibiotics, characterized by antibiotic overuse is widespread in the treatment of outpatient ARIs.

Key words: Acute respiratory infection, primary health care, antibiotic over-use

Introduction

Lower respiratory tract infections, defined in the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) as pneumonia or bronchiolitis, are a leading cause of mortality and morbidity worldwide. Nearly 2•38 million deaths resulted from lower respiratory infections in 2016, making lower respiratory infections the sixth leading cause of mortality for all ages and the leading cause of death among children younger than 5 years.(1). Respiratory tract infections (RTIs) are a leading cause of death among adults and children, accounting for 12% of all deaths worldwide. In low- and middle-income countries, upper respiratory tract infections account for 11.3% and 5.4% of all deaths, respectively; in additionally, they are common causes of school and work absenteeism. (2). For patients, clinic visits are inconvenient, requiring time and costing money. (3). Respiratory tract diseases, particularly, ARIs are form one of the most common reasons for visits to the primary care physician and thus exerting enormous pressure on health services. (4). ARIs include common cold, otitis media, sinusitis, pharyngitis, acute bronchitis, influenza and pneumonia. Most ARIs are self-limitinged, do not require medical evaluation and can be managed with over-the-counter medications. (5, 6).

ARI visits also result in antibiotic prescriptions (7), many of which are inappropriate. (8). ARIs account for 50% of antibiotic prescriptions to adults and 75% of antibiotic prescriptions to children (9). Unnecessary antibiotics increase health care costs, expose patients to adverse drug reactions and increase the prevalence of antibiotic-resistant bacteria. (10, 11).

In Saudi Arabia, ARI was found to be the most common diagnostic label used in more than half of the prescriptions; antibiotics were prescribed for 53%, anti-cough for 43% and anti- histamine for 20% of patients with ARIs. (12). In this context, optimizing therapy for ARIs is an appropriate area for action. Health care providers in Saudi Arabia have become aware of the problem of prescribing for ARIs and to solve this problem among children, “the national protocol for diagnosis and treatment of acute respiratory infections among children in health care centers and small hospitals” has been developed. (13). However, studies in Makkah Al Mukarramah reported that many physicians were not following the WHO guidelines for Acute Respiratory Infection (14). Educational health programs should be conducted to sensitize the physicians as well as patients regarding the appropriate method of diagnosis and rational use of antibiotics (15). This study was conducted to explore causes of ARTIs in outpatient clinics and to study drug prescription for ARIs.

Subjects and methods

Design: A cross section study was conducted on outpatient visits to two general hospitals; one in a relatively high socioeconomic level (SEL) area, and the other in a relatively lower SEL one.

Sampling: The sampling technique was a convenient one; the total number of outpatient visits enrolled was 1,200 patients during the period September 2017- May 2018.

Collection of data: Patients were examined by the physicians in the outpatient clinics of both hospitals and they filled in predesigned check lists. It included information on place of the hospital, year of examination, complaints, assessment of vital signs, diagnosis, investigation and management as well as outcome of the visits.

Data analysis and statistical tests: Data was analyzed using the Statistical Package for Social Sciences (IBM SPSS, version 22, Armonk, NY: IBM Corp.). Chi square test of significance was employed. The level of significance for the study was 0.05.

Results

Out of the 1200 visits, respiratory tract disorders accounted for 26.12%. They ranked second to cardiovascular disorders (31.5%), and exceeded those due to gastro-intestinal disorders (14.8%). The frequency of lower respiratory tract infections (LRTIs) and upper respiratory tract infections (URTIs) was almost equal (49.2% and 50.8% respectively). Acute bronchitis (37.1%), and acute pharyngitis/ tonsillitis (36.7%) were most common respiratory diseases. Fever (63.9%) and cough (61.3%) were the most common presenting symptoms. Antibiotics (37.1%) and analgesics (26.2%) were the most common drugs prescribed to patients with acute respiratory infection.

Table 1 reveals that URTIs were more common in children under 15 years old, compared to adult patients; on the other hand LRTIs were more common in those older than 15 years, compared to under 15 years old children ($p < 0.001$). The symptoms, earache, headache, sore throat, runny nose, and fever were significantly more common among URTIs compared to LRTIs ($p < 0.05$). On the other hand, the symptoms cough, dyspnea and wheeze were more significantly encountered among LRTIs compared to URTIs ($p < 0.05$). A greater proportion of patients with LRTIs were ordered routine or specific investigations compared to patients with URTI ($p< 0.000$).

Acute bronchiolitis was exclusively encountered among under five children, while acute bronchitis was most common among those over 40 years old. Lobar pneumonia was more encountered among those aged 40 to 60 years, while bronchopneumonia was more encountered among school age children. Pharyngitis, tonsillitis and otitis media were more encountered among less than 15 years old children; all these differences were statistically significant where $X2$ was 78.7 and $p < 0.000$ (Table 2). Antibiotics were prescribed to 53% of school age children, and 36.3% of under five children; these were significantly higher than to other age groups ($p< 0.05$).
Antibiotics were prescribed mainly for cases with tonsillitis

Table 1: ARTI according to age, gender, presenting complaint and investigations ordered

Variable	Characteristics	ARTI		X2 (p)
		URTI (Number 159)	LRTI (Number 154)	
Age groups in years	< 5 years	43.4%	28.6%	18.3 (< 0.001)
	5 -	24.5%	16.2%	
	15 -	21.4%	31.2%	
	40 -	6.9%	16.2%	
	60 +	3.8%	7.8%	
Gender	Males	62.3%	68.8%	1.5 (<0.222)
	Females	37.7%	31.2%	
Earache	Present	10.1%	0.0%	16.3 (<0.000)
Headache	Present	6.3%	0.6%	7.3 (<0.007)
Sore throat	Present	46.5%	2.6%	80.7 (<0.000)
Runny nose	Present	34.0%	6.5%	36.3 (<0.000)
Cough	Present	35.2%	88.3%	92.9 (<0.000)
Dyspnea	Present	0.6%	34.4%	62.6 (<0.000)
Wheeze	Present	0.0%	2.6%	4.1 (<0.04)
Vomiting	Present	3.8%	5.2%	0.37 (<0.543)
Fever	Present	73.4%	53.6%	13.2 (<0.000)
Investigations	No	34.6%	13.7%	29.3 (<0.000)
	Routine	56.0%	57.5%	
	Specific	9.4%	28.8%	

Antibiotics were prescribed mainly for cases with tonsillitis (76.9%) and lobar pneumonia (62.5%). However it was also prescribed to patients with acute bronchitis (32.8%), pharyngitis (32.6%) and common cold/influenza (18.2%). These differences were statistically significant where p< 0.000 (Table 3). The highest frequency of prescribing drugs for the different diseases was as follows: nasal drops for sinusitis (40%), anti-histamine and bronchodilators for bronchopneumonia (23.1% and, 38.5% respectively), analgesic for pharyngitis (44.9%), and corticosteroids for acute bronchitis (23.1%). These differences were statistically significant where p values were < 0.05. Most commonly prescribed antibiotics were amoxicillin and other penicillin (64.7%), Macrolides (23.5%, ceftriaxone (11.7%) and ciprofloxacin (5.9%).

Table 2: ARTIs and drug prescribed for different age groups

Variables	Age groups in years (numbers = 313)					X2 (p)
	< 5 (113)	5- (64)	15– (82)	40– (36)	60+ (18)	
Acute bronchiolitis	7.1%	1.6%	0.0%	0.0%	0.0%	78.7 <0.000
Acute bronchitis	23.0%	26.6%	48.8%	61.1%	61.1%	
Lobar pneumonia	3.5%	3.1%	7.3%	8.3%	5.6%	
Bronchopneumonia	5.3%	7.8%	2.4%	0.0%	0.0%	
Common cold/influenza	8.8%	3.1%	9.8%	2.8%	5.6%	
Pharyngitis	31.9%	28.1%	26.8%	22.2%	27.8%	
Tonsillitis	11.5%	17.2%	2.4%	0.0%	0.0%	
Otitis Media	8.0%	12.5%	0.0%	0.0%	0.0%	
Acute Sinusitis	0.9%	0.0%	2.4%	5.6%	0.0%	
Antibiotic	36.3%	53.1%	32.9%	27.8%	22.2%	10.7 (<0.03)
Nasal drops	15.0%	9.4%	1.2%	0.0%	0.0%	18.2 (<0.001)
Anti-histaminic	10.6%	6.3%	11.0%	11.1%	0.0%	3.2 (<0.520)
Corticosteroids	1.8%	3.1%	1.2%	2.8%	0.0%	1.2 (<0.876)
Cough mixtures/Expectorants	9.7%	18.8%	12.2%	11.1%	11.1%	3.1 (<0.572)
Analgesic	30.1%	26.6%	24.4%	22.2%	16.7%	2.2 (<0.705)

Table 3: Drugs prescribed for different ARTIs

ARTIs	AB	ND	AH	BD	AG	CS
Acute bronchiolitis (number: 9)	22.2%	0.0%	0.0%	11.1%	11.1%	0.0%
Acute tonsillitis (Number: 26)	76.9%	7.7%	0.0%	0.0%	38.5%	0.0%
Acute bronchitis (Number: 116)	32.8%	0.0%	5.2%	24.1%	11.2%	23.1%
Bronchopneumonia (Number: 13)	30.8%	0.0%	23.1%	38.5%	23.1%	0.0%
Otitis Media (Number: 17)	41.2%	0.0%	5.9%	0.0%	23.5%	1.1%
Pharyngitis (Number: 89)	32.6%	14.6%	19.1%	3.4%	44.9%	0.0%
Pneumonia (Number: 16)	62.5%	0.0%	0.0%	0.0%	6.3%	0.0%
Sinusitis (Number: 5)	40.0%	40.0%	0.0%	0.0%	20.0%	0.0%
Common cold/ Influenza (Number: 22)	18.2%	31.8%	9.1%	9.1%	40.9%	0.0%
X2 (p)	28.4 (<0.000)	45.7 (<0.000)	21.5 (<0.006)	38.6 (<0.000)	38.7 (<0.000)	33.1 (<0.000)

AD Antibiotic; ND: Nasal drops; AH: Anti-histaminic; BD: Bronchodilator; AG: Analgesic; CS: corticosteroid.

Discussion

This study was conducted to explore causes of ARIs and reveal prescribing pattern of drugs for ARIs in primary health care facilities. Although, the study is based on convenient samples which could not accurately portray the pattern of ARI in the private health care sector in Jeddah city, however, the large number of studied patients (1,200 cases), may justify this study as an exploratory one, which may prompt the need for further studies, based on cluster samples, to assess the situation in the region.

Out of the 1200 visits, ARIs accounted for 26.12%. This is in line with previous studies which revealed that ARIs were among the leading causes for visiting primary health care (4 – 6). The majority of the visits with ARIs were for less than 15 year-old children (56.5%); this is in line with previous studies in Saudi Arabia (14, 17). This might reflect the composition of the Saudi population pyramid, as 50% of the population is under the age of 15 (18). In the present study, males were more affected by ARIs compared to females. This is in line with several other studies (19 – 21). This could be due to involvement of males in outdoor activities more often than females which render them more vulnerable to ARI. Unlike several previous studies, we found that URIs and LRIs were almost similar in frequency among the visits to outpatient clinics in hospitals (14,17,19 – 20). This might reflect the type of patients who prefer to visit the hospitals. Mild self-limited UTRIs, which are caused mainly by viruses, may make the patient reluctant to visit a doctor, particularly in outpatient clinics of hospitals; on the other hand LRTIs with prolonged cough may urge the patient to visit a physician in outpatient clinics of hospitals as they might get better care.

Fever was the most common symptom encountered among patients with ARIs (63.9%). This is in line with previous studies (14,17,19). Cough was encountered in 61.3% of cases with ARIs. Runny nose and sore throat were reported by 20.4% and 24.9% of the cases respectively.

These are in line with previous studies in Saudi Arabia (17,19). It was shown in some studies that a large proportion of patients with rhinovirus infections would continue to cough for more than 2 weeks (22). The present study revealed that acute bronchitis (37.1%), and acute pharyngitis (28.4%) were most common respiratory diseases. This is in line with previous studies (14, 17). Most of these illnesses are self-limiting which points out the importance of implementation of community based health education programs to prevent these illnesses and educate the public about self-management of these self-limiting diseases and when to use the health care facilities (5,6). Antibiotic was the drug most frequently prescribed for patients with ARIs (37.1%). This is in line with previous studies (5,8,14). Amoxicillin and other penicillin groups were the most frequently prescribed antibiotics (64.7%). This is consistent with other studies (8,13,14). In the present study antibiotics were prescribed mainly for cases with tonsillitis (76.9%) and lobar pneumonia (62.5%). However it was also prescribed to patients with acute bronchitis (32.8%), pharyngitis (32.6%) and common cold/influenza (18.2%). This is in line with Havers et al in 2018 who found that among 14/987 outpatients with acute respiratory infections, 41% were prescribed antibiotics, 41% of whom had diagnoses for which antibiotics are not indicated, primarily viral upper respiratory tract infections and bronchitis (24). Indiscriminate use of antibiotics should be discouraged. Antibiotics should be reserved for cases with group A beta hemolytic streptococcal pharyngitis and patients with bacterial complications such as otitis media, pneumonia and sinusitis (23,24). Antibiotics should be used when clinically indicated. This will help to slow the emergence of resistant bacteria (25). Concomitant with clinical therapies, prevention and other health promotion strategies should be carried out.

Conclusion

Our study adds to evidence that misuse of antibiotics, characterized by antibiotic overuse and inappropriate antibiotic selection, is widespread in the treatment of outpatient ARIs.

We must strengthen outpatient antibiotic stewardship efforts to eliminate antibiotic treatment for viral URIs and acute bronchitis, which our study indicates would make the largest contribution to decreasing unnecessary antibiotic prescriptions. Increased efforts are needed to support improved adherence to guidelines for antibiotic prescribing for common diagnoses, including more stringent adherence to group A Streptococcus (GAS) pharyngitis testing guidelines and clinical criteria for antibiotic treatment of sinusitis, as well as interventions focused on appropriate selection of first-line antibiotics for these conditions if treatment is indicated. The Centers for Disease Control and Prevention published “Core Elements of Outpatient Antibiotic Stewardship, (26) which provides guidance to clinicians and enable leadership to implement activities to improve antibiotic use.

Limitations of this study

This study is based on a convenient sample. It was a hospital based study.

List of abbreviations

SEL: Socio-economic level
KSA: Kingdom of Saudi Arabia
SPSS: Statistical package for Social Sciences
ARI: Respiratory tract infection
URTI: Upper respiratory tract infection
LRTI: Lower respiratory tract infection
OM: Otitis Media
Group A Streptococcus: GSA

Declarations

-Ethics approval and consent to participate

Ethical clearance was obtained from the institutional review board (Protocol identifier 006MP25082019; Application of human ethics committee approval -1-, 25/08/2019). Permission was obtained from the directors of the outpatient clinics for collecting data from the records. Data collection procedure was anonymous.

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Use of traditional eye medicine and self-medication among population of Taif City, Saudi Arabia: a cross sectional study

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Abstract

Background: The haphazard use of traditional eye medicines (TEM) has increased eye problems like corneal ulceration and infections. Lack of knowledge regarding the adverse side effects regarding these biological products is an important concern of public health. The widespread use of medicines for eye related problems, without a doctor's consultation or prescription, is common practice. The aim of this study is to assess the prevalence of self medication and attitude and practice regarding the use of TEM for eye related problems.

Materials and methods: We did a cross-sectional study using a pre-tested and validated questionnaire. The study was done in a private shopping mall in Taif city, Saudi Arabia during the month of October, 2018 after obtaining ethical clearance. We included responses of 431 participants for our analysis. The questionnaire included two parts, part 1 recorded the socio-demographic details and part 2 had questions related to knowledge, attitude and practice related to self medication and use of TEM. An independent statistician did the statistical analysis using SPSS ver. 23.

Results: The prevalence of self medication for eye problems in our study was found to be 35% who preferred using traditional eye medicaments over modern medicines. There was a very strong relationship between the education level of the participants and usage of medication without consulting a doctor ($p<0.001$). Redness of the eye due to usage of TEM was reported by 2.9% of the participants.

Conclusion: The use of TEM and self medications for eye problems in Saudi Arabia is not uncommon. Even though most of the participants are aware of the harmful effects of some of the Traditional medicaments, there is a need to raise the knowledge and awareness regarding use of TEM and self medicaments for eye problems.

Key words: eye problems, self medication, Saudi Arabia

Background

Eyes are one of the vital organs of human body and it is essential to take care of many things to keep them healthy and also avoid many things to protect them from harm. Some of the things people commonly do to maintain good eye health are wear sunglasses, stop smoking, eat healthy diet, routine eye examination especially above age of 40 years, protection of eyes during work or sports, use of contact lens etc. World Health Organization (WHO) and its partners have launched a global initiative titled 'The Right to sight' to reduce visual impairment and burden of eye illness (1). It is also important to consult a physician or ophthalmologist for any eye problem and take appropriate medicines and follow treatment instructions. There is a common practice of use of Traditional eye medicines (TEM) in much of the population especially in those from the Asian countries.

TEM refers to use of biologically related medicines, therapies or any practices that are applied to the eye or administered orally to resolve any eye related disorders (2).

In a study conducted in India about the use of traditional eye medicine (TEM) and self-medication in rural India, they found that 396 (18.2%) use ophthalmic medications without consulting an ophthalmologist. Also, (61.4%) of participants use kajal, (31.4%) honey, (11.7%) ghee and (9.1%) rose water as home remedies for the eye(3). Another study in Africa, reported that cases with acute corneal ulcers had a history of usage of traditional eye medication. The study also found that the medication used consisted of dried plant material as per the information from traditional healers in Malawi (4). In south-eastern Nigeria, the reported prevalence of TEM usage among new ophthalmic outpatients is low and only (5.9%) used TEM for their eye disease and belief in potency of TEM was the main reasons for using traditional eye medication (5).

A study conducted in Pakistan identified some of the most common home remedies used for each eye condition as follows: a) for burning, itching, watering and foreign bodies - splashes of cold water, b) for redness, pain, swelling and crusting of eye– alum was commonly used c) For minor trauma like finger nail trauma etc. - surma (a traditional ceremonial dye which keeps eye cooler) was used and d) For sharpening of the vision - surma with some other substances combination was used (surma, honey, black pepper and turmeric paste)(6).

A study done in the district of Harare, Zimbabwe reported the prevalence of TEM usage among new patients was 61.5% and they found that there is significant association between use of TEM and incidence of corneal ulceration, corneal vascularisation, endophthalmitis, evisceration, exenteration and legal blindness at presentation(7).

The use of TEM in the Kingdom of Saudi Arabia lacks proper evidence and there are no recent studies done regarding the same in spite of its usage in many regions in Saudi Arabia which could have a relationship with many eye complications. Hence, the main aim of this study was to assess the prevalence of use and attitude towards of self medication and TEM use among a cross sectional population of Saudi Arabia. Also, we will assess knowledge and practice about common eye disease and symptoms among the Taif city population.

Methodology

Study design and data collection:
The study was a cross sectional study. All the data required for the study was collected using a self-designed questionnaire containing demographic data and questions to assess knowledge, awareness and practice about traditional eye medication. The questionnaire was pre-tested using a pilot study done on 25 patients and it was checked for its validity and reliability.

Setting:
The study carried out in Taif city, Saudi Arabia through World sight day campaign was carried out at a Private shopping mall in the month of October 2018 (11th October).

Study population and sample:
Convenient sampling technique used according to the availability of the participants in the World sight day campaign. Participants were informed about the nature of the survey and were informed about the confidentiality and anonymity of the information they provided. A final sample of 431 participants from both genders was included. Participants who did not give consent for participation were excluded from the study.

Data Management and Statistical Analysis:
Data entry and analysis was done using SPSS Ver. 23 (IBM Corp. USA). Descriptive statistics used frequencies, percentage, mean and standard deviation for analysis quantitative and numerical variables. Students 't' test was used for inter-group comparisons and chi-square tests used to test relationship between categorical variables and use of self medication.

A p value of less than 0.05 was considered statistically significant at 95% Confidence interval with a β value (0.8)80%.

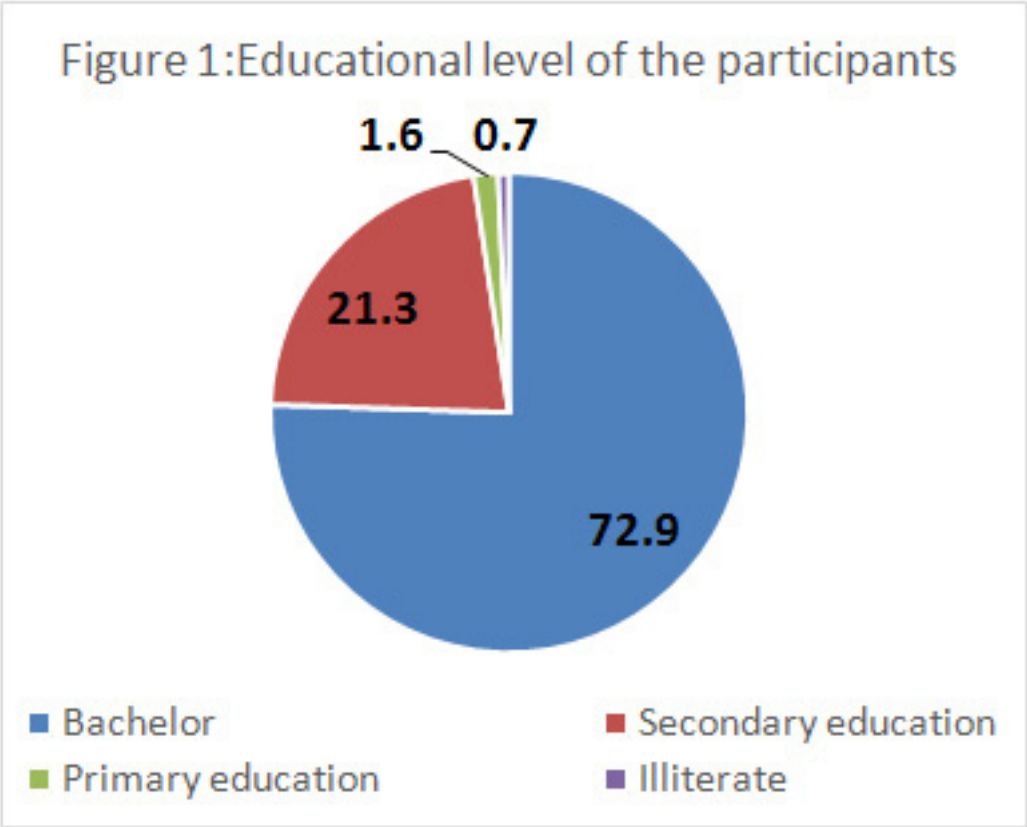
Ethical consideration:
The study was approved by the Ethical Committee of Taif University.

Results

This was a cross-sectional survey that included 431 participants of which 75.6 % were female and 24.4% were male. We had participants from almost all age groups and the maximum number of participants (43.9%) was seen from the age group of 20-29 years. The minimum number of participants was seen from the age group 10-19 years (4.6%). Table 1 shows the prevalence of self medication as analysed in our study population and was found to be 35%.

Table 1: Age wise distribution of participants		
Age groups	Frequency	Percentage
10-19 years	20	4.6 %
20-29 years	189	43.9%
30-39 years	104	24.1 %
40 years and above	118	27.4%

The education levels of the participants showed that 72.9% of them had Bachelors degree and 0.7% were illiterate (Figure 1).



From the participants who had an eye problem, 43.4 % of them preferred to go first to a private eye clinic, while 32.3 % chose to go first to ophthalmologist in a government hospital.

The most given reason for not going to ophthalmologist in case of eye problem was ''other concern'' in 56 persons (13.0 %), then ''it takes too much time to reach hospital'' in 16 persons (3.7 %), then ''satisfied with treatment available to them'' in 15 persons (3.5 %), then ''Financial problems'' in 7 persons (1.6 %), then ''Afraid of treatment'' in 3 persons (0.7%), the least given answer was ''Family problems'' in 2 persons (0.5%).

When we asked the participants if they are using eye medications without consulting a doctor, 151 participants (35%) said "YES" they used medication without consulting doctors; on the opposite side 280 participants (65%) said "NO" they actually consult doctors if they want to take any medication. Redness of the eye followed by itching then burning sensation were the most common reported eye problems that make participants use medication without a consultation.

There was a very strong relationship between the education level of the participants and usage of medication without consulting a doctor ($p<0.001$). Participants with Bachelor level of education who answered "Yes" were 112 (25.9%) and those who answered "NO" were 202 persons (46.8%); 29 (6.7%_ with Secondary Education answered "YES" and 63 (14.6%) answered "NO" , and 01 (0.2%) with Primary Education answered "YES" and 6 (1.39%) answered "NO" and of those who were in the Illiterate category were 1 person (0.2%) who answered "YES" and 2 persons (0.4%) who answered "NO".

We observed that there was a very strong relationship between the age and using medication without counseling ($p<0.001$). Participants in the age group of 10-19 years who answered "yes" were 9 (2.08%) and those who answered "no" were 11 persons (2.55%). Among participants belonging to 20 – 29 years 69 persons (16%) answered "yes" and 120 (27.8%) answered "no". Among those who were in 30–39 years 40 persons (9.28%) answered "yes" and 64 (14.8%) answered "no" and of those more than 40 years of age 33 (7.65%) answered "yes" were and 85 (19.7%) answered "no".

In our study we found that out of 431 participants, 74.7% of them used to 'check the expiry date of the eye medicine', while 21.3% reported that they 'don't check the expiry date of the eye medicine' and 3.9% said "there is no expiry date on the medicine". 55% of them reported that they 'don't use anything beyond the eye medicine', 6.0% used 'Kohl Ethmed', 5.6% used 'honey', 2.8% used 'water and salt', 0.9% used 'milk', 0.5% used 'lemon', 0.2% used 'Ghee' and 29% used other things for eyes. The majority of the participants (90.7%) reported that they prefer using modern medicines to traditional medication to treat eye problems and 9.3% prefer traditional medication. 78.0% of the participants reported that they 'don't think traditional eye medications are safe and effective'.

When participants were asked whether they suffered from any eye problems due to use of traditional medicaments, about 73% of the participants answered "No", 16.5% "other" and 10.4% "Yes". Table 2 shows the most common eye symptoms related to using traditional eye medications.

Table 2: Frequencies of eye problems due to usage TEM.

	Frequency	Percent
Redness of the eye	11	2.6
Watery eyes	4	0.9
Discharge from the eye	2	0.5
Burning sensation	8	1.9
Itching of the eye	4	0.9
Decrease in vision	6	1.4
Pain in the eye	1	0.2
Blurring of vision	4	0.9
Other	3	0.7
Didn't answer	388	90.02
Total	431	100.0

When the participants were asked 'what is the right time to consult a doctor in case of trauma to the eye?', 68.4% of them reported that it is necessary to consult the doctor "immediately", 13.5% think that they will consult the doctor "as needed", 6.0% said that they will consult the doctor "within 6 hours", 4.9% (within 7-24 hours), 3.5% chose "I do not know", 2.6% "within 1-7 days" and 1.2% "Anytime".

Two thirds of the participants had the belief that using lemon inside the eye causes injury to it, however half of the participants think using 'ethmed khol' inside the eye does not cause injury to it. The majority of the participants think that using chemical substances and fireworks in the eye causes injury to the eye (Table 3).

Table 3: Questions related to injury of eyes due to TEM usage

Questions	Answers	Frequency	Percent
Do you think that using honey inside the eye causes injury to it?	yes	169	39.2
	no	146	33.9
	I do not know	116	26.9
Do you think using lemon inside the eye causes injury to it?	yes	283	65.7
	no	76	17.6
	I do not know	72	16.7
Do you think using ethmed khol inside the eye causes injury to it?	yes	124	28.8
	no	216	50.1
	I do not know	91	21.1
Do you think fireworks in the eye causes injury to it?	yes	341	79.1
	no	63	14.6
	I do not know	27	6.3
Do you think using chemical substances inside the eye causes injury to it?	yes	342	79.4
	no	60	13.9
	I do not know	29	6.7

Discussion

This cross-sectional study was conducted to find out the prevalence of and attitude toward self medication and TEM use among Taif city population. In our study, 35% of participants reported that they used medication for eye problems without consulting a doctor. A study conducted in the city of Riyadh found that 35% of medications bought by patients from community pharmacies without a prescription were those that 'must be prescribed by a doctors only' medicines; however, in our study, after nearly three decades, we found a similar situation (8). This finding is in contrast to other studies done in different countries of the world (9-11,3). In our study, we found that only 9.3% of the surveyed population prefer traditional medicines over allopathy. The study findings show that the prevalence of use of TEM was lower compared to other studies conducted in the Indian population where 25.7% of patients were using TEM.(3)

A study done by Akeel MM et al in Saudi Arabia reported that use of traditional medicines for any problems is found to be three times higher among participants with high school degrees compared with those holding university degrees (12) . People with higher educational levels are more concerned and exposed to information, and are ready to accept new treatment ideas and facilities (13). This could also be related to the use of TEM for eye problems. Low educational level and income may push individuals towards finding ways to save on costs, and time on consultations by approaching pharmacists directly or indirectly obtaining them from relatives or friends (14).

When their opinion regarding the safety and effectiveness of TEM was asked only 22.0% of people responded yes to this. Another study done in the Kingdom reported that the majority of users believe that traditional or herbal medicines are effective and safe (15). Use of Complementary and Alternative Medicine (CAM) has gained wide popularity in Saudi Arabia and has also brought some concerns and fears over the professionalism of practitioners, quality, efficacy and safety of the 'natural' formulations available on the market. Adulteration, inappropriate formulation, drug interactions, misdetection of plants or herbs and or its usage has led to adverse reactions that are life-threatening or lethal to patients (16). Studies show people using self-medication, were not aware of the contents or expiry date of the ophthalmic preparations (17).

Use of traditional eye medicines and self-medication among the Saudi population is not well documented. 10.4% reported that they suffered from some eye problems related to the use of TEM. Among these common problems was redness of the eye. Chirambo and Benezra reported the prevalence of blindness was 25% among blind school pupils due to the use of TEM (18). The incidence of endophthalmitis was found to be higher (30%) following the use of TEM at the extremes of age in a study done by Chinda et al. (19). Studies reported that TEM was associated with the incidence of corneal ulceration, corneal vascularisation, endophthalmitis, evisceration, exenteration and legal blindness at presentation (20).
The use of these traditional medicines often leads to corneal infections and frequently result in a poor visual outcome. This infection is often due to contamination or wrong ingredients and also due to delay in antibiotic therapy (21).

68.4% reported that they would consult a doctor immediately for any trauma related to the eye. This gives us an indication that the participants are aware of the limitations of TEM in the case of an emergency. The participants believed that the use of honey (39.2%) and lemon (65.7%) causes injury to the eye.

We found out there is a very strong relationship between age and using the medication without consultation. This finding contrasts with other studies which reported that traditional eye practices are not dependent on the participant's age, gender, level of education, religion or marital status (11, 20).

The self-medication of antibiotics may cause significant adverse effects, such as treatment failure, drug toxicity and antibiotic resistance (21, 22). In order to reduce the frequency of self-medication, regulatory measures and public education regarding the side effects and dangers of self medications is very much needed. (23-24) Thus, the current situation can be further improved in Saudi Arabia by enforcing strict laws and regulations for TEM and aelf medications and also by increasing the public's awareness about the dangers of excessive consumption of antibiotics.

Conclusion

Our study demonstrates a higher prevalence of self medications for eye problems even though there are strict laws in the kingdom compared to other developing countries. Improper use of TEM has produced some injuries as reported by our patients and still it is common in the country. The government of Saudi Arabia needs to monitor and control the practice of self medications and also increase the awareness among the public regarding the adverse effects of these practices.

Conflict of interests: The authors declare no conflict of interests.

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Stone-free rate after extracorporeal shockwave lithotripsy in the management of renal stones in relation to different sizes and locations of the stone

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Abstract

Background: Extracorporeal shockwave lithotripsy is one of the outpatient procedures that are used to fragment a kidney or ureteric stone into small pieces to help them to pass through the urinary tract without blocking the ureter.

Aim of the work: Assessment of extracorporeal shockwave lithotripsy (ESWL) in the management of renal stones in relation to different sizes and locations of the stone.

Objectives: To identify the success rate of ESWL in treatment of renal stones according to stone size and location and compare it with untreated ureteric stones.

Method: Retrospective cohort study between 2014 and 2018 carried out by obtaining data from electronic health records and patients' files for all patients who had ESWL in King Abdulaziz Medical City, Jeddah. Analysis was done for multivariables such as stone size, complications, number of sessions used and the need for other procedures. The collected data were analyzed by computer using Statistical Package for Social Science (version 20, SPSS Inc., Chicago, IL).

Results: This study included 88 patients, 64.7% were males and 35.3% were females who complained of having stones. These patients had 124 stones (79 kidney stones and 45 ureteric stones) out of them 67 (54.03%) subjects who went for 1 session, 31 (25%) subjects who went for 2 sessions and 26 (20.97%) subjects who went for 3 sessions. The overall success rate of ESWL was 41.13%, out of 45 subjects who had ureteric stones; 18 (35.29%) subjects had a successful ESWL.

Conclusion:
Future researchers should consider investigating the impact of other factors dually such as success rate, and the following parameters: BMI with age, BMI with gender, BMI with size of the stone, age with gender, age with size of the stone, gender with size of the stone.

Key words: extracorporeal, lithotripsy, stone, location

Introduction

Urolithiasis ranks as the third most common disease that affects the urinary tract system. It depends on many factors such as gender, family history, climate, diet, ethnicity among other genetic factors (1). Its prevalence is estimated to be from 2-3% of the general population (2), and is found to increase in areas with hot climate rather than cold climate (3).

The majority of stones are localized in the kidney and ureter and it represents nearly 97% of all stones, mostly in the ureter and the localization of the stones is affected by many factors such as demographic characteristics (4).

Urolithiasis can be managed either conservatively, by either major or minimally invasive procedures (2). Extracorporeal shockwave lithotripsy (ESWL) is an alternative, non-invasive method that uses shockwaves to disintegrate urinary tract stones (5). Since it was introduced during the 1980s, ESWL quickly became the standard treatment of the majority of urinary tract stones (6).

The study aims to identify the success rate of ESWL in the treatment of renal stones according to their size and location. This will, accord-ingly, guide physicians within the institution to direct patients to the optimal choice of treatment. It will also open a door for further investigations in case the success rate is different than the universal rate. Errors might be due to lack of experience or technical errors.

Patients and methods

Type and site of the study:
This is a retrospective cohort study carried out by obtaining data from electronic health records and patients files (BESTCare system) for all patients who had ESWL in a four year duration from January 2014 to June 2018 in King Abdulaziz Medical City, Jeddah.

Study population:
All adult patients with renal or ureteric stones measuring from 5 to 20 millimeters who underwent ESWL were included in the study while those with undocumented stone size and site were excluded.

Out of 121 patients who had ESWL, the calculated sample size was 88 considering a power of 80% and alpha level of 0.05 with success rate of 79 in kidney stone of vs. 45 in ureteric stones [9].

Study procedure:
The type of ESWL used in King Abdulaziz Medical City is the SIEMENS Lithoscope electromagnetic lithotripter. The lithotripter generates shock waves which can be focused on the stone to result in disintegration of the stone. This process requires generation of shock waves by the lithotripter and coupling mechanism of the lithotripter to the skin of the patient as near as possible to the kidney. These shock waves should be focused on the stones by the help of fluoroscopy. Targeting of stones for SWL is done with the assistance of X-ray.

After the stone is located the lithotripter is directed to it, and it generates shock waves that disintegrate the stone. The maximum number of shock waves delivered in a session is 3,000 to 3,500 shock waves.

Data management:
The collected data were coded, entered, presented, and analyzed by computer using a database software program, Statistical Package for Social Science (version 20, SPSS Inc., Chicago, IL). Chi square test using SPSS version 23 was used for comparing qualitative data in patients who had renal with those with ureteric stone. Subgroup analysis was done based on stone size (5-10 mm vs. 10.1-20 mm). Independent t-sample test was used to find if there is a significant difference in the success rate based on BMI.

Ethical considerations:
Ethical approval for the study was obtained from the ethical review committee of the King Abdulaziz Medical City, Jeddah. Confidentiality of data was ensured and data was only accessed by the researcher.

Results

This study is a retrospective cohort study during the period 2014 to 2018, that included 88 patients; 64.7% were males and 35.3% were females, who complained of having stones. These patients had 124 stones (79 kidney stones and 45 ureteric stones) out of which 67 (54.03%) subjects went for 1 session, 31(25%) subjects went for 2 sessions and 26 (20.97%) subjects went for 3 sessions (Table 1).

Regarding the success rate, the analyzed results showed that the overall success rate of ESWL was 41.13%, out of 45 subjects who had ureteric stones, 18 (35.29%) subjects who had a successful ESWL, while 27 (64.71%) failed. Regarding the renal stones there were 79 subjects, out of whom only 33 (64.71%) subjects had success, while 46(35.29%) failed with no significant difference between them (P value= 0.847) (Table 2).

Regarding the success rate related to size, out of 74 subjects who had stones size between 5 to 10 mm, 28 subjects (54.9%) had success and in 46 subjects (45.1%) had failure. The total number of subjects who had stones between 10.1 to 20 mm was 50 subjects and the success rate was seen in 23 (45.1%) while the failures were seen in 27 (54.9%) with no significant difference between them (P value =0.365) (Table 3).

Table 1: Basic characteristics of the studied participants (n=88)

	Stones		P-value
	Renal stones	Ureteric stones	
Age mean±SD	48.77 ± 14.04	49.04 ± 13.28	NS
Gender			
Male	36	21	NS
Female	18	13	
Total	**54**	**34**	
BMI **mean±SD**	30.46 ± 6.12	30.70 ± 5.98	NS
Size			
5-10mm	46 37.1%	28 22.58%	NS
10-20mm	33 26.6%	17 13.71%	
Total	**79 63.7%**	**45 36.3%**	
Number of sessions			
One	39 31.45%	28 22.58%	
Two	23 18.55%	8 6.45%	NS
Three	17 13.71%	9 7.26%	
Total	**79 63.7%**	**45 36.3%**	
Other intervention			
No	48	21	
PCNL	2	0	
URS	7	9	
Stent	15	7	
PCNL+Stent	1	0	
URS+Stent	6	8	
Total	**79**	**45**	

Table 2: Outcome of ESWL regarding site and size of the stones

	Outcome		P-value
	Success	Failure	
Site			
Ureteric stones	18 (35.29%)	27 (64.71%)	
Renal stones	33 (64.71%)	46 (35.29%)	NS
Size			
5-10mm	28 (54.9%)	46 (45.1%)	NS
10.1-20mm	23 (45.1%)	27 (54.9%)	

Table 3: Outcome of ESWL regarding site and size of the stones

Site	Size		P-value
	5-10mm	10.1-20mm	
Ureteric Stones	14 (27.45%)	4 (7.84%)	0.02*
Renal Stones	14 (27.4%)	19 (37.25%)	0.016*

Discussion

This study is retrospective cohort study that included 88 patients who complained of stones at different sites (kidney and ureteric) and of different sizes, who underwent ESWL.

The study reported that the overall success rate of ESWL was 41.13%.

The success rate among subjects with ureteric stones was (35.29%) while the success rate of those with the renal stones was (64.71%) with no significant difference between them (P value= 0.847). Regarding the success rate related to size, stones (5 to 10 mm), it was (54.9%) while that of stones between 10.1 to 20 mm was (45.1%) with no significant difference between them (P value =0.365). About (54.03%) of subjects needed 1 session, (25%) of them went for 2 sessions while (20.97%) of subjects needed 3 sessions.

Many studies have been conducted and revealed different success rates at different sites and stone sizes. A study conducted on 117 patients who underwent ESWL with their mean age was 38.2 ± 14.1 and where the majority of them (75.2%) were males revealed that the overall frequency of stone clearance after ESWL for renal stones was 70.9%. Regarding number of ESWL sessions, most cases (65.8%) needed 3 ESWL sessions while only (4.3%) of cases needed only one session. About 29.9% needed 2 sessions (7).

A higher success rate was revealed with a study conducted in Jeddah, Saudi Arabia which reported that ESWL for ureteric calculi had a success rate of (88.7%) with only (5.65%) of patients having some residual stone (8).

Another study conducted in Iran included about 138 subjects and reported that the overall success rate of ESWL was 71.7%. The success rates were different at different sizes as (8-10 mm, 11-15 mm, and 16-20 mm) stones success rates were (23.7, 55.7, and 20.6%) respectively. In addition, the success rate of ESWL was measured based on stone location where 68.3% of the renal stones and 81.1% were ureteral stones, with no significant differences in the success rate of lithotripsy between these two locations (9) .

In a study conducted in India in 2017 the results of the efficacy of ESWL in lower ureteric calculus showed that the stone-free rate in stones ≤10 mm was (88%) while it was only in (56.5%) in stones >10 mm 10.

Another study that included 76 patients with mean size of the stone was 1.08 ±0.59 cm reported that the post- ESWL stone-free-rates were different even in different locations in the kidney as it was 47% in lower pole kidney stones, 70.58% in upper and mid pole stones and 68% in renal pelvis stones (11). This may be attributed to the feasibility of the waves to reach the stones and their nature.

A cohort study that was conducted in Sudan including patients with kidney (72.5%) and ureter (27.5%) stones managed by ESWL revealed that the stone free rate was correlated with the number and site of the stones. The overall stone success rate was very high (96.6%). But the rate of complete resolution was not affected by the site of stone impaction (p=0.8) (12).

On the other hand, other studies reported that the success for stone fragmentation and clearance varied greatly regarding stone size, site and composition (13, 14).

It can be reported that ESWL is an effective intervention for managing kidney and ureter stones and it works optimally for kidney stones (4 mm to 2 cm) and stones up to 1 cm in the ureter (15).

Conclusion

Future researchers should consider investigating the impact of the other factors: success rate, and the following parameters: BMI with age, BMI with gender, BMI with size of the stone, age with gender, age with size of the stone, gender with size of the stone.

Also, we recommend for future researchers a prospective study as there were many missing valuable data that we excluded due to poor documentation and vague information.

Many patients did not follow up after the procedure which in our opinion was either because they became symptom free or because they changed the health care facility.

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Prevalence of vitamin B12 deficiency in type 2 diabetes patient treated with metformin

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Abstract

Background: Metformin-induced vitamin B12 deficiency was shown by several studies with a prevalence estimate ranging from 5.8% to 52%.

Objectives: This study aimed to assess the prevalence of vitamin B12 deficiency in patients with Type 2 diabetes mellitus (T2DM) on metformin.

Methods: A cross-sectional observational study was done on 347 type 2 diabetic patients who were using the drug 'metformin' for at least six months and who attended a specialty diabetic clinic at Taif city of Saudi Arabia. Information on patients age, gender, type of metformin, assay results for Vitamin B12, and medical history were obtained. Vitamin B12 levels in serum were tested.

Results: The mean age of the patients was found to be 58.10 ± 14.31, and the mean Vitamin B12 level was found to be (464.99 ± 419). The prevalence of vitamin B12 deficiency among participants was 10.4%. Patients with borderline levels were approximately 20.2% and the remaining 69.5% had normal vitamin B12 levels. No statistically significant difference was found between different age groups according to the mean level of Vitamin B12. Those who were on Metformin 1 mg and Metformin 750 mg had a statistically significant higher percentage of those who had deficient Vitamin B12 (<200) than those on Metformin 500 mg.

Conclusions: Vitamin B12 supplementation should be prescribed for diabetic patients to prevent the occurrence of vitamin B12 deficiency complications.

Key words: Prevalence, vitamin, B12, deficiency, diabetes, metformin

Introduction

Diabetes mellitus is a metabolic disorder in which there is a higher blood glucose level than normal, which produces symptoms like polyuria, polydipsia and polyphagia and may produce complications like kidney problems, heart attack, blindness, nerve problems, loss of limbs, and sexual dysfunction (1). Metformin (a biguanide derivative), is the most commonly prescribed anti-diabetic drug and is associated with certain adverse effects, mainly lactic acidosis (2). Metformin reduces these complications by controlling blood glucose levels and restores the body's response to insulin (3).

Vitamin B12 plays a fundamental role in biological activities including DNA synthesis, haemopoesis and neurological functions. Hence its deficiency may cause haematological and neuro-cognitive dysfunctions (4). Many research studies have suggested an association between Metformin use and vitamin B12 deficiency (5,6,7).

The first evidence of vitamin B12 malabsorption in patients who were under Metformin was reported by Berchtold et al in 1969 (8). Although the association between long-term metformin use and low vitamin B12 levels has been shown, studies show that there are considerable variations in the prevalence estimates of metformin-induced vitamin B12 deficiency which ranges from 5.8% to 52% (9-13). These wide variations could be due to the differences in the associated factors such as patient's age, study settings, metformin dosage and duration of use etc. The exact mechanism of how metformin induces vitamin B12 deficiency is not clear, but currently the accepted explanation is interference of calcium dependent membrane at the terminal ileum, which is responsible for Vitamin B12 –intrinsic factor absorption. (14-15). This effect could be reversed with calcium supplementation (16).

In the Kingdom of Saudi Arabia, the effect of metformin in Vitamin B12 metabolism is poorly studied and there is lack of data regarding its deficiency. Hence this study aimed to assess the prevalence of vitamin B12 deficiency in patients with Type 2 diabetes mellitus (T2DM) on metformin and if the presence of vitamin B12 deficiency has a relationship with dose of metformin consumed.

Subjects and Methods

Study design and time frame: This study was a cross-sectional observational study done between March and May 2019.

Study setting: The study was done on patients attending a specialty diabetic clinic in Taif city of Saudi Arabia.

Sampling methodology: The study participants included Type 2 diabetic patients who were using the drug 'metformin' for at least six months. All ages and both genders were included. Patients who have or had previous history of pernicious anemia, alcoholism, gastrectomy, gastric bypass surgery, pancreatic insufficiency, malabsorption syndromes, and surgery involving small intestine or HIV infection were not included in our study. Patients who were on Vitamin B12 supplementation in any form for the last 6 weeks were also excluded from our analysis.

Study instrument: Information on patient's age, gender, type of metformin, assay results for Vitamin B12, medical history were obtained. Vitamin B12 levels in serum were tested after explaining the nature of the study and those who agreed to have the assay was performed in the laboratory of the study setting (clinics) after the concerned doctors requesting the same. Vitamin B12 levels were categorized into normal (>300 mg/dl), borderline (200-300 mg/dl) and deficient (<200 mg/dl) as suggested by Berg RL and Shaw GR (17).

Ethical considerations: Ethical clearance for the study was obtained from the Research Ethics Committee of Medical Services Department for Armed Forces Scientific Research Center and from Taif University. Patients were informed about the nature of study and consent was taken from all participants.

Statistical analysis: Data were analyzed using the SPSS statistical program version 23. (IBM Corp. USA). Categorical variables were expressed as number and frequencies and Chi-square test was used to assess the relationship between variables. Quantitative variables were presented as mean and standard deviation, and independent sample t- test and ANOVA test were used to assess the relationship between variables. A p-value of less than 0.05 was considered significant.

Results

Our cross-sectional study included a total of 347 patients who were on metformin for Type 2 diabetes mellitus (T2DM). We had 211 females and 136 male patients spread across different age groups (Figure 1, Figure 2). The mean age of the patients was found to be 58.10 ± 14.31, where females had a mean age of 56.27 ±13.9 and males mean age was 60.9 ± 14.4 (Table 1). The mean Vitamin B12 level was found to be 464.99 ± 419.00 where females had a mean level of 473.2 ±502.45 and males had a mean level of 452.13 ±238.70 (Table 2).

When the mean level of Vitamin B12 across different age groups was compared we didn't find any statistically significant differences (p>0.05). The mean level was found to be more in the age group of 61-89 years followed by 41-60 years (Table 3).

The vitamin levels were categorized into 'Normal (>300), Borderline (200-300) and Deficient (<200). When we assessed the relationship of the levels of Vitamin B12 with type of the dosage of Metformin used, we found that the 'Deficient levels (<200) were more in Metformin 1 mg and Metformin 750 mg than Metformin 500 mg and this had a statistically significant association (p<0.05) (Table 4).

When we compared levels of Vitamin B12 across different types of metformin consumed, it was found that the type metformin 1 gm had comparatively low levels of Vitamin B12 than other types and this was statistically significant ($p<0.05$). The mean level of Vitamin B12 in patients who are on Metformin 750 mg was about 430.6 ± 250.9 and in those who were on Metformin 500 mg was 520.8 ± 538.27.

Figure 1: Gender distribution of the participants

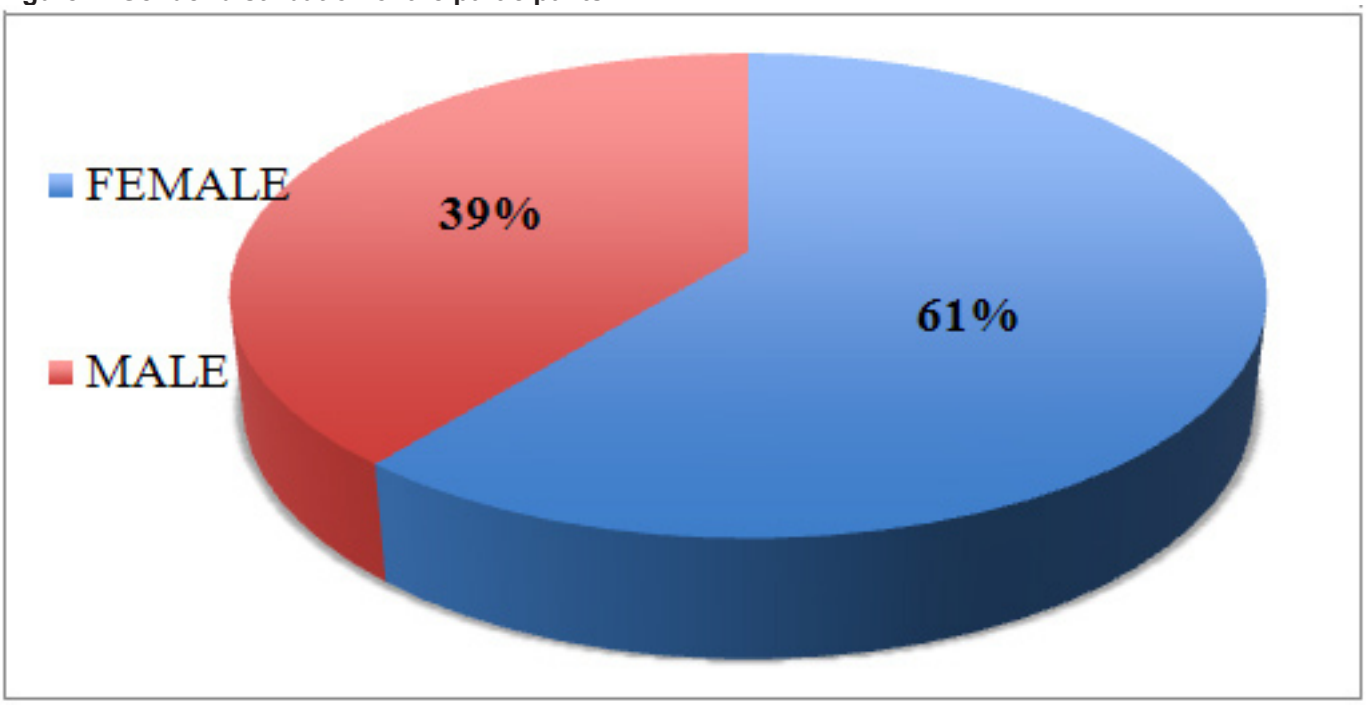

Figure 2: Age distribution of the participants

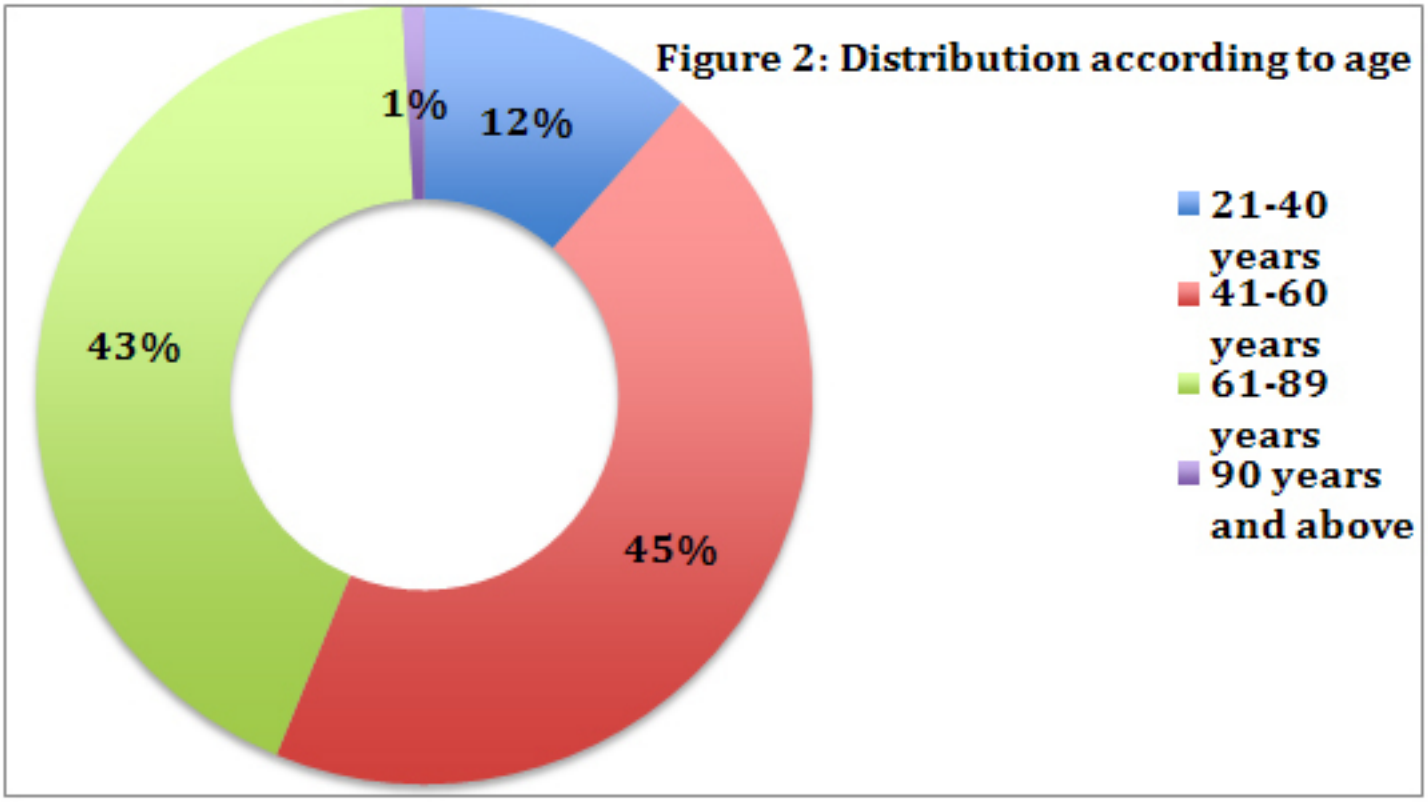

Table 1: Mean age of the participants

Gender	N	Mean	Std. Deviation	Minimum	Maximum
Female	211	56.27	13.929	21	103
Male	136	60.96	14.493	29	96
Total	347	58.10	14.317	21	103

Table 2: Mean vitamin B12 levels based on gender

Gender	N	Mean	Std. Deviation	Minimum	Maximum	Independent 't' test	
						t	p-value
Female	211	473.28	502.45	105	6001	0.459	0.647
Male	136	452.13	238.70	157	1683		
Total	347	464.99	419.00	105	6001		

Table 3: Comparison of vitamin B12 levels in different age groups

Age	N	Mean	Std. Deviation	Minimum	Maximum	ANOVA test	p-value
21-40	40	374.6	128.9	117.00	835.0	0.735	0.532
41-60	155	474.5	512.9	158.00	6001.0		
61-89	149	480.5	356.8	105.00	2778.0		
≥90	3	403.0	418.2	135.00	885.0		

Table 4: Relationship of drug used and vitamin B12 levels

Variable		Drug type			Total	Chi-square test	p value
		Metformin 500 MG Tablets	Metformin 750 MG XR Tablets	Metformin 1 GM Tablets			
Vitamin B12 Levels	Normal >300	130 (73.9%)	79(67.5%)	32(59.3%)	241 (69.5%)	11.7	0.019
	Borderline 200-300	35(19.9%)	25(21.4%)	10(18.5%)	70 (20.2%)		
	Deficient <200	11(6.3%)	13(11.1%)	12(22.2%)	36(10.4%)		
Total		176 (100%)	117(100%)	54 (100%)	347 (100%)		

Discussion

Studies have already shown that metformin use has an impact on the serum Vitamin B12 levels in type 2 DM patients (18,19). Our study evaluated whether there were any differences in the Vitamin B12 levels between three dosages of metformin oral drugs such as Metformin 500 mg, 750 mg and 1000 mg (1 gm).

The mean Vitamin B12 level in the study participants was found to be 473.28 ±502.45. A study done by Aroda VR et al. reported mean Vitamin B12 levels of 546 ± 337.2 in those who are at one-year follow up of metformin therapy and 615.9 ± 503.8 in those who were on 13-year metformin follow up (20). Another study done in South Africa reported a mean Vitamin B12 level of 260.6 ±163.7 those who are metformin therapy (21).

In our study, it was not surprising to note that the mean Vitamin B12 levels are more than the expected deficient or borderline levels as there are previous studies, which have also demonstrated similar findings (20,22). A study done in Saudi Arabia, which compared the Vitamin B12 levels between Metformin users and non-metformin users found that mean level in metformin users was 313.68 ±141.84 and in non-users, it was 365.37±189.88 (23). Even though the selected study patients did not consume any Vitamin B12 supplements; the diet of these people has not been recorded.

There could be a possibility that the usual diet of the patients may be the reason for comparatively high levels of serum vitamin B12 levels than the expected deficient levels. Food items like meat, fish, chicken; fortified cereals and dairy products are major sources of vitamin B12 (24,25) and most of the Saudi population follow a non-vegetarian diet which includes the above-mentioned food items which are rich in Vitamin B12 levels (26). When compared to non-vegetarians, the prevalence of vitamin B12 deficiency is high among vegetarians (27).

Our findings didn't find any gender-based differences in the vitamin B12 levels for those who are on metformin therapy. A Study done in one of the Middle Eastern countries has shown a mean deficiency level of 312.36 pmol/ in women and 284.31 pmol/L in men (28). The difference in deficiency levels between the two genders has been attributed to certain biological factors. In women, estrogen may play a helping role against vitamin B12 deficiency by reducing the homocysteine levels (29).

Another factor is albumin, which is comparatively more in men than women. The levels of albumin increase as the muscle mass increases and hence it has an inverse relationship with vitamin B12 levels (30,31). The gender differences in vitamin B12 levels could also be explained based on genetic variations. Studies show that single nucleotide polymorphism in the gene 'fucosyl-transferase 2' has been associated with vitamin B12 malabsorption in men (32,33).

It is well postulated that the risk of vitamin B12 deficiency and type 2 diabetes mellitus increases as age increases (34,35). The prevalence of vitamin B12 deficiency (<148pmol/L) above the age of 65 ranges from 6-25%(36.37). Surprisingly in our study, we observed that the mean levels of vitamin B12 above 60 years were more than those below 40 years of age in patients on metformin therapy. This finding in the Saudi population contrasts with the claim that metformin therapy decreases the vitamin B12 levels. Even though the mean levels of vitamin B12 in the age group >60 years is more than <40 years, the mean levels remain below the defined high serum vitamin B12 level (950 pg/ml (701 pmol/l) (38).

The reason for these normal levels of vitamin B12 in some of the patients on metformin therapy could be again explained on the basis of the diet, which is very rich in vitamin B12 (26). A study reported that presence of immune complexes of IgG, IgM, and vitamin B12, contributing to the increased vitamin B12 concentrations in patients without any diseases like disseminated neoplasia, hepatic disease, myeloproliferative disorders, and hypereosinophilic syndromes etc. that usually have high serum vitamin B12 levels.

One of the unique aspects of this study was the comparison of vitamin B12 deficiency levels in patients with three different doses of metformin (500 mg, 750 mg and 1000 mg). To our knowledge, there are no previous studies done in the Kingdom, which used these doses of metformin to compare the levels of vitamin B12 deficiency. There are studies done in Saudi Arabia which compared the levels of vitamin B12 in patients who are consuming metformin 1000 mg, 1000-2000 mg, <2000 mg (23). Our results showed that only 6.3% of the patients who used metformin 500 mg had vitamin B12 levels in the deficient category compared to 750 mg and 1000 mg groups. Also, we noticed (73.9%) were in the normal range. These findings show that low doses of metformin (500 mg) might not cause severe vitamin deficiency. Studies show that low doses (250 mg X 3 times/day, 500 mg X 2 times/day) of metformin can be prescribed for patients who are pre-diabetic for the prevention of diabetes (40,41).

Limitations

Several limitations of the study should be addressed before generalizing the findings. The duration and frequency of metformin use were not studied as both could influence the levels of vitamin B12 (20,22). The dietary pattern of the patients was not studied and most of the people of Saudi Arabia consume a non-vegetarian diet, that has high cobalamin content which could also compensate for the deficiency of vitamin B12 from metformin use. Another drawback could arise from the reporting bias of metformin use by the patients. The self–reported frequency of metformin usage might be different from the actual usage since the doses used in our study are comparatively lower doses (<=1500 mg) and there is a tendency in patients to miss or ignore the timely intake of prescribed drugs either due to carelessness or forgetfulness. We also didn't assess the Body mass index as obesity could have an effect on vitamin B12 levels (42). The smoking status of patients was not assessed as smoking could have vitamin B12 deficiency (43). All these factors must be considered when planning a more evaluative study in the future.

Conclusion

The overall prevalence of vitamin B12 deficiency in metformin users in our study was found to be 10.4%. Patients with borderline levels were about 20.2% and the remaining 69.5% had normal vitamin B12 levels. There was a statistically significant relationship seen between the dosage of metformin and vitamin B12 deficiency. Patients who consumed Metformin 1000 mg showed more vitamin B12 deficiency than 500 mg. Low doses of metformin <=500 mg might not have a profound effect on vitamin B12 metabolism which suggests that these doses could be used in pre-diabetic conditions. Vitamin B12 supplementation should be prescribed for diabetic patients to prevent the occurrence of vitamin B12 deficiency complications.

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Study of awareness about complications of sickle cell disease during pregnancy in Jeddah City

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Abstract

Background: Pregnancy in Sickle Cell Disease (SCD) is at very high risk. Major steps for prevention are to carry out various programs, surveys, educating and increasing awareness about the disease and its consequences including morbidity and mortality. So, the aim of the current study was to assess the awareness about complications of SCD during pregnancy in Jeddah city, Saudi Arabia.

Method: An observational cross-sectional study was carried out on 410 participants from the general population in Jeddah city, Saudi Arabia in April 2019. The tools used in this study consisted of self-administered questionnaire divided into three sections (socio demographics, perception of SCD, and Knowledge about SCD and its complications).

Results: The study sample included 410 participants, most of them female (91%) and 9% male. More than 50% of participants were aged between 20 to 30 years old and about 59.9% were married. 73.4% were university students. Regarding detection of the level of knowledge which was measured through the scoring applied the study found that most of the participants had moderate knowledge about SCD (>60%) and there was no difference regarding socio-demographic characteristics.

Conclusion: Overall knowledge about SCD and its complications during pregnancy was moderate. So, we recommend health education programs about all aspects of SCD which should be designed, implemented and evaluated among general populations.

Key words: Knowledge, Complications, Sickle Cell Disease, Pregnancy.

Introduction

Sickle cell disease (SCD) is a hemolytic anemia characterized by abnormally shaped (sickle) red blood cells (RBCs), which are removed from the circulation and destroyed at increased rates leading to anemia (1).

Abnormality in RBCs shape is mainly attributed to the presence of hemoglobin S, which, when deoxygenated, becomes relatively insoluble and forms aggregates with other hemoglobin molecules within the RBCs (2).

A point mutation in the gene coding the β chain of the hemoglobin molecule results in a single amino acid substitution (valine for glutamic acid), which leads to hemoglobin S (3).

SCD is one of the most common genetically inherited diseases affecting mainly African Americans. In addition, it is a prevalent disorder among those from the Mediterranean area like in Turkey, and the Arabian Peninsula (4).

This disorder affects millions of individuals worldwide and is prevalent in an estimated 90,000 individuals in the United States, primarily individuals of African American descent, as well as those from regions of South America, the Caribbean, and Central America and individuals of Middle Eastern ancestry or from the Mediterranean region (5).

SCD occurs in one of every 500 African American births, and an estimated one of every 12 (2 million African Americans) have the sickle cell trait (6).

Recently, Saudi Arabia has been reported to have an increasing prevalence of SCD. The carrier status for SCD ranged from 2% to 27%, and up to 1.4% had SCD in Saudi Arabia (7).

In addition, the prevalence of consanguinity ranges from about 60% in Saudi Arabia up to 90% in some Bedouin communities (8).

The pathologic hallmarks of the disease are vaso occlusion, chronic hemolysis and increased erythrocyte adhesiveness to vascular endothelium (9).

SCD is believed to be a tetrad of pain syndromes, anemia and its sequelae , organ failure (including infection), and comorbid conditions, with pain dominating the clinical picture, and it may either be spontaneous or be triggered by the other three components of the tetrad (10).

The patient suffering from sickle cell anemia develops blood related complications and can be suspected due to a family history or by conducting clinical examination. But confirmation of a case can only be carried out by laboratory investigation (11).

Complications of SCD include serious infections, damage to vital organs, stroke, kidney damage, respiratory problems, bone marrow failure, growth failure, and cognitive impairment, maturational delay in children as well as high maternal and fetal morbidity and mortality. Recurrent complications interfere with the patient's life, especially with regard to education, work, and economic, social and psychosocial development (12).

SCD carriers are absolutely normal and healthy like any healthy person and do not know that they are carriers unless they have a special blood test, HbS electrophoresis (13).

Pregnancy in SCD is at very high risk. Many reports have documented a considerable maternal risk of morbidity and mortality and high perinatal adverse outcomes (14).

Recently, Oteng-Ntim et al., in a systematic review and meta-analysis of previous observational studies, have quantified this risk. They showed that women with SCD have an increased risk of preeclampsia and maternal death, stillbirths, preterm deliveries, and small for- gestational-age newborns (15).

Knowledge of these risks has contributed to the implementation of a multidisciplinary management program including the early detection and treatment of complications during pregnancy and postpartum, follow-up by an obstetric team and a sickle cell team, appropriate pain management protocols, and transfusion programs adapted to each pregnant patient (16).

Regarding SCD treatment, routine general prophylactic and corrective measures have been associated with marked improvement in life expectancy and quality of life among sickle cell disease patients in developed nations, which points to the importance of providing proper information on SCD. Early community-based surveys conducted on African Americans in large urban areas demonstrated limited awareness of SCD in these communities (17).

Major steps for prevention is to carry out various programs, surveys, educating and increasing awareness among the people so that maximum active participation from the population can be achieved, which is vital. Success cannot be achieved without people actively involved and showing willingness towards limiting the disease and its consequences including morbidity and mortality which can improve quality of life among the population (11).

Aim of the work: Assessment of the awareness about complications of sickle cell disease during pregnancy in Jeddah city, Saudi Arabia.

Objectives: To evaluate knowledge of complications of sickle cell anemia during pregnancy among the general population in Jeddah city.

Rationale: There is a lack of information among the general population about sickle cell anemia and its complications especially during pregnancy. Therefore, community awareness about SCD and its complications during pregnancy can enhance the control of the disease and prevent its adverse outcomes.

Patients and methods

This was an observational cross-sectional study done among the general population aimed to study the awareness about sickle cell anemia and it's complication especially during pregnancy.

A-Technical design

1. Study design:

An observational cross-sectional study

2. Study setting:

Jeddah City, data collection took place in April 2019.

3. Target populations:

Included general population as self-administered questionnaire was applied in a Google form which had been loaded on the internet.

♦ **Inclusion criteria:**

- All ethnic groups
- Any age group (20 to more than 50 years old)
- Male and female
- All people login to fill the questionnaire until we reached the required sample size.
- People filled out a consent form to participate in the study.

Exclusion criteria:

- People whose age was less than the selected age groups.
- People who did not meet the criteria of admission.

4. Sample size and technique:

Our sample was:

- The prevalence of SCD in Saudi Arabia is high, about 2% to 27% have sickle cell trait and 2.6% have SCD, so sample calculated was 410.
- Sampling: conventional sample.
- Selection of sample: when sample size had been completed, the application form closed.
- Sample size was estimated using EPI INFO (Epidemiological Information Package) version (21) 3.5.3.statistical packages assuming that the frequency was (20%) at a confidence interval of 95 % and power of 80%.

B-Operational design

1. Pilot study

A pilot study was carried out to evaluate the validity and reliability of the questionnaire applied on patients. Test-retest reliability was assessed using the questionnaire twice on 10% of the sample size (41subjects). Based on the result of the pilot study some modifications and rearrangement of some questions were done. Validation of the questionnaire was made as follows: the questionnaires were translated using a back-translation technique. An expert translated the original questionnaire from English into Arabic. Arabic version of the questionnaires was translated back into English by a bilingual individual. The back-translated and original versions of the questionnaire were compared with attention given to the meaning and grammar.

Data collection tools:

Tools:

Self-administered questionnaire divided into three sections (Boyd et al., 2005 and Alturaifi et al., 2018)17:

1-First Section:

Included personal and socio-demographic data:

Age, gender, marital status, educational level and occupation

2-Second section:

Included participant perception about SCD which was measured in 6 close-ended questions.

3-Third section:

Included Knowledge about SCD and its' complications, which was measured by 11 closed-ended questions.

Knowledge score: Included knowledge of the studied participants about SCD. A total Knowledge score was calculated, eight questions were given one point for answer yes, and zero for answer no, or I don't know, while four questions were calculated as each correct answer or the proper answer selection were given one point; summation of the correct answers for all questions was done and given 35 points as total knowledge score. So, the higher the score, the better the knowledge.

2. Data management:

The Collected data were recorded then presented and analyzed using SPSS (Statistical Package for the Social Sciences) version 22.0 and Epi info for windows version 3.5.3.

Data were represented in tables and graphs as frequencies and percentages.

C. Ethical considerations:

Ethical considerations were taken throughout the whole study including approval of the study protocol by Institutional Human Ethics Committee, Ibn Sina National College for Medical Studies, Jeddah, KSA; agreement of the participants to fill out the questionnaire was taken after explaining the purpose of the study and assuring them regarding data confidentiality, however, each subject was given a unique identifier code.

D. Constraints:

Some constraints were involved as we needed to increase the sample taken to avoid the not completely filled out questionnaires.

Results

The study sample included 410 participants most of them females (91%) and 9% males. More than 50% of participants were between the age group 20 to 30 years old and about 59.9% were married. 73.4% were university students (Table 1, Figures 1-5).

Table 1: Demographic characteristics among studied subjects

Demographic Character		No	%
Age	20-30	241	58.8
	31-40	78	19
	41-50	64	15.6
	>50	27	6.6
	Total	**410**	**100**
Gender	Female	375	91
	Male	37	9
	Total	**410**	**100.0**
Marital Status	Single	117	43.2
	Married	217	59.9
	Widow	11	2.7
	Divorced	5	1.2
	Total	**410**	**100.0**
Educational level	1ry school	2	0.5
	Intermediate school	9	2.2
	High school	81	19.8
	University	301	73.4
	High education	17	4.1
	Total	**410**	**100**
Occupation	Employee	145	35.4
	Un employee	48	11.7
	Student	133	32.4
	Housewife	84	20.5
	Total	**410**	**100**

Figure 1: Age distribution of studied subjects

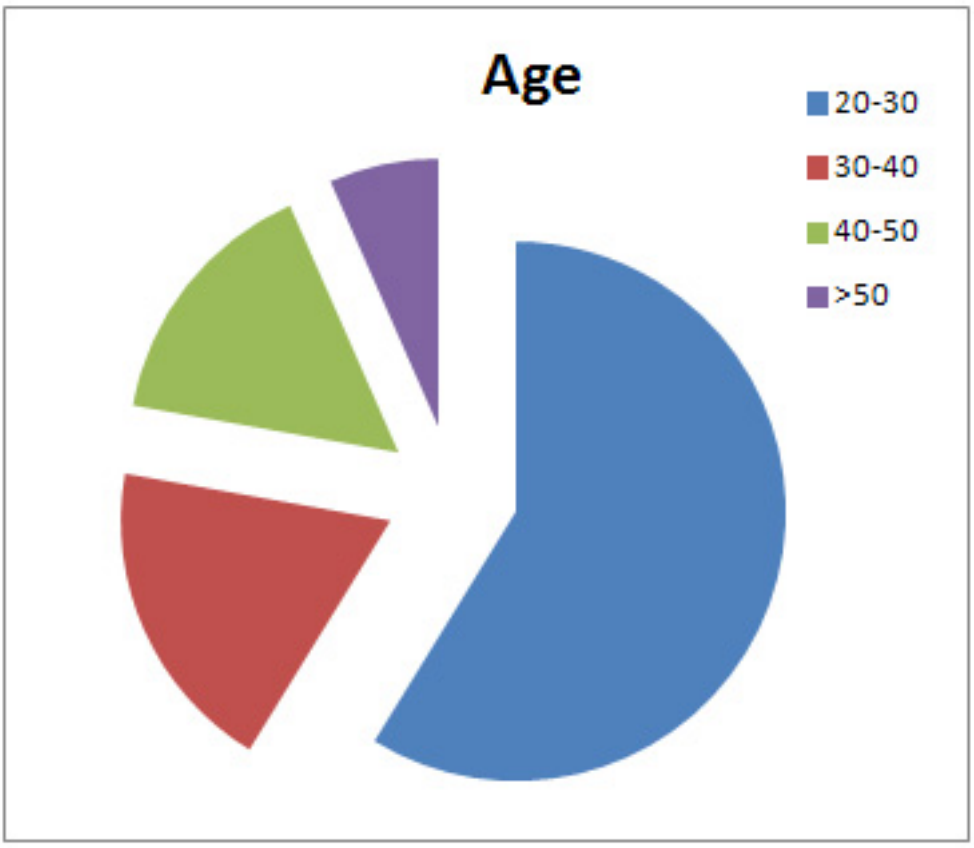


Figure 2: Gender distribution of studied subjects

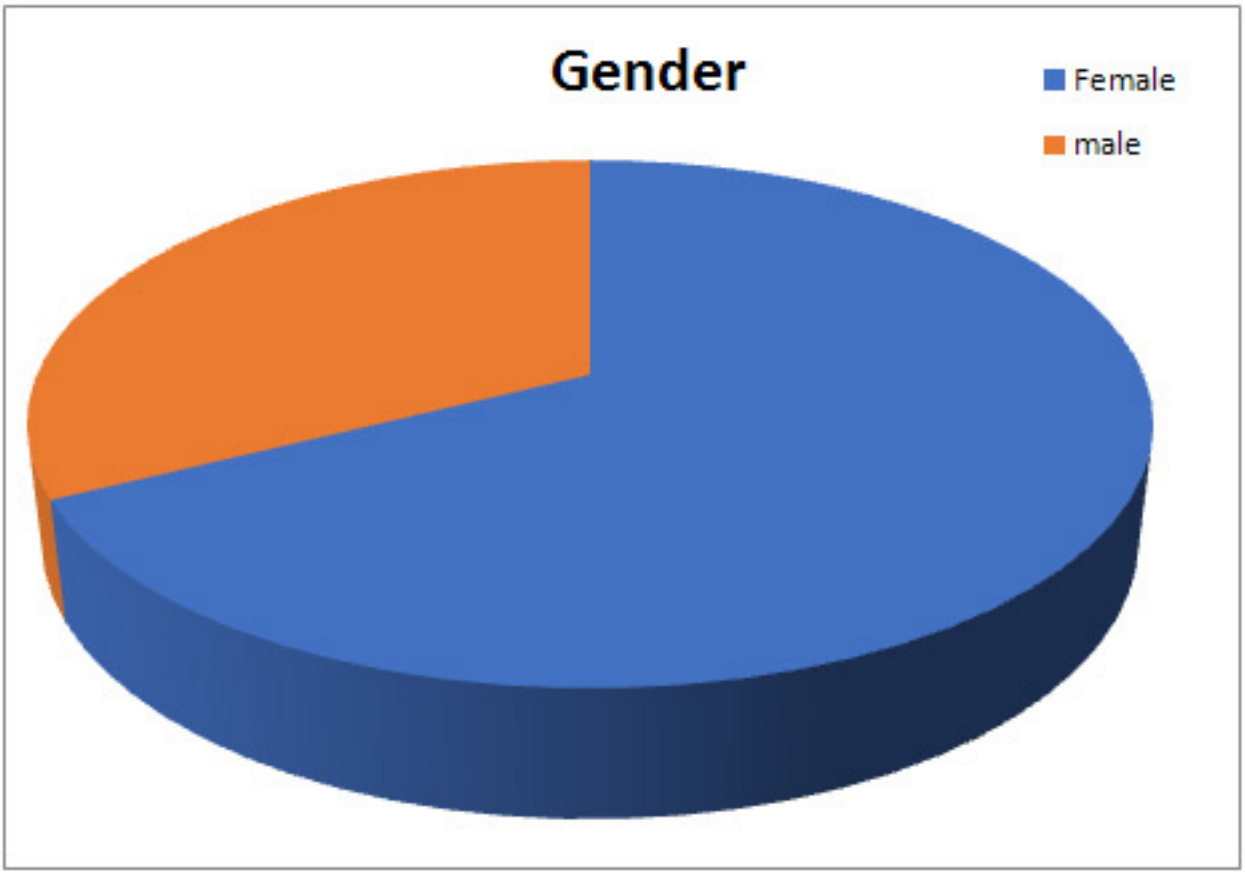


Figure 3: Marital status of studied subjects

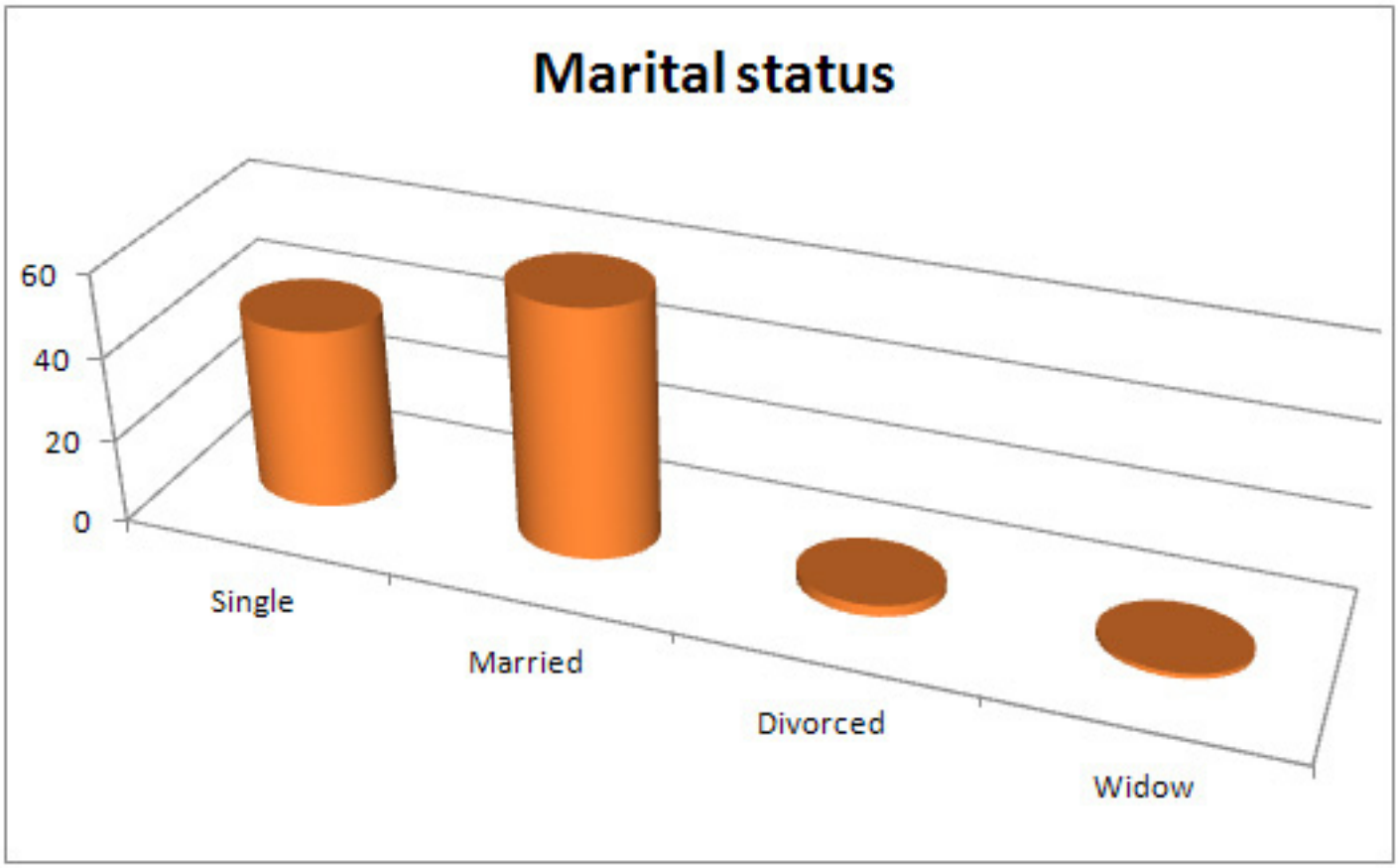


Figure 4: Educational level of studied subjects

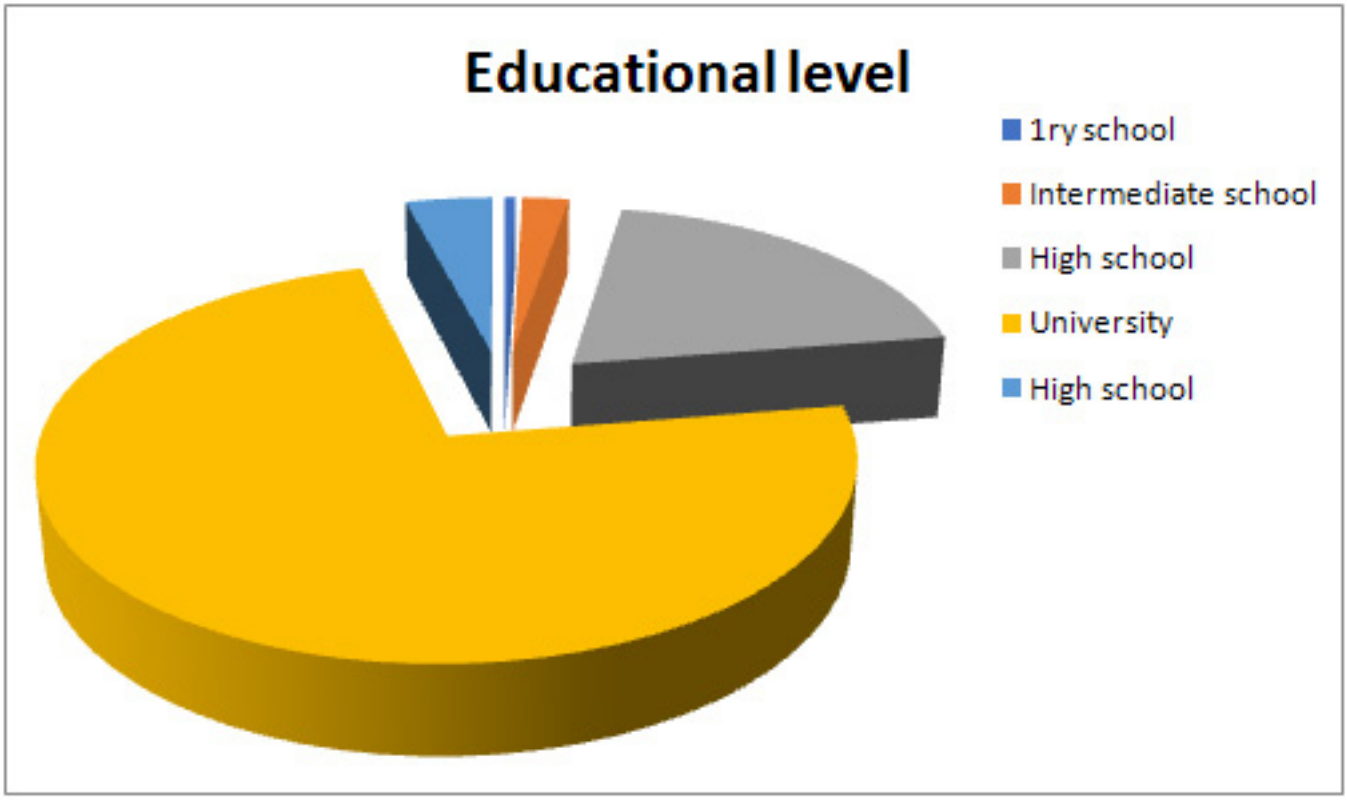
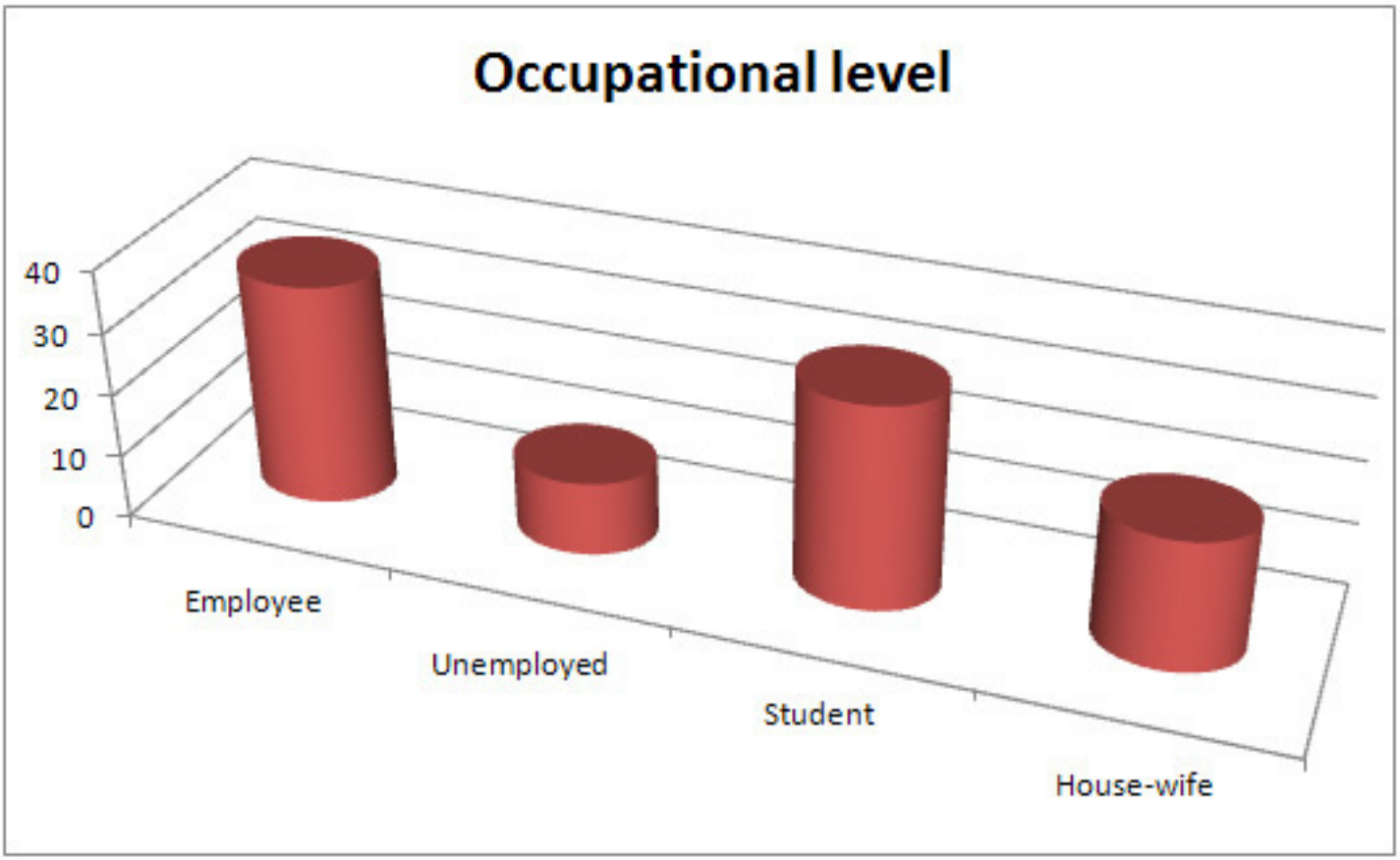


Figure 5: Occupational level of studied subjects

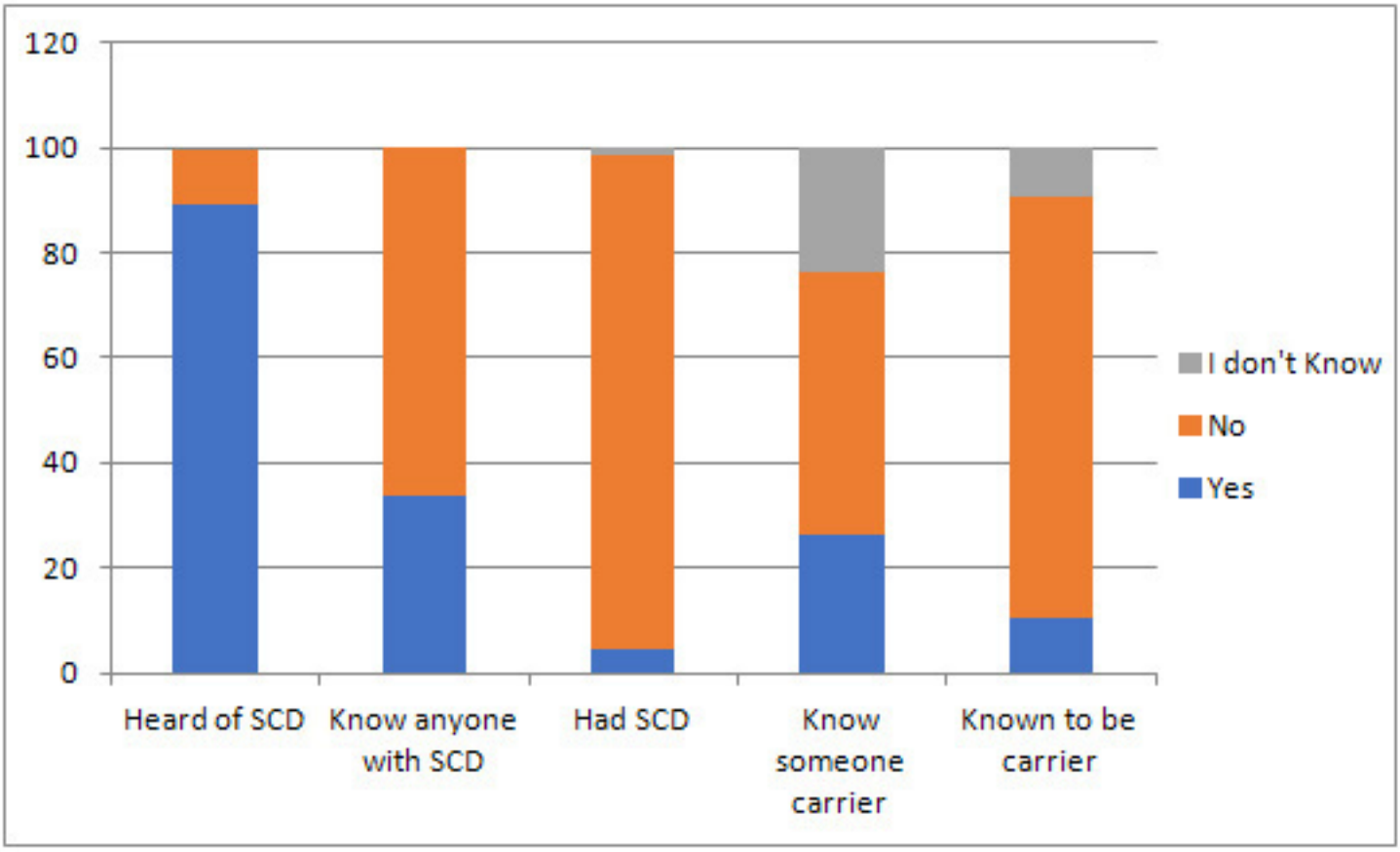


Perception of participants to sickle cell anemia, found that the majority of them (89.5%) had heard about the disease; 44.4% heard about it from the school. More than 66% of the participants did not know anyone with SCD, only 4.4% had the disease and 10.5 were known to be carrier as shown in Table 2.

Table 2: Participants' perception of Sickle cell disease

		No	%
Have you ever heard of Sickle cell disease?	Yes	365	89.5
	No	43	10.5
	Total	**408**	**99.5**
How did you hear about it?	Awareness program	156	38
	Healthcare worker	71	17.3
	At school	182	44.4
	Total	**409**	**99.8**
Do you personally know anyone with sickle cell disease?	Yes	139	33.9
	No	271	66.1
	Total	**410**	**100.0**
Do you have sickle cell disease?	Yes	18	4.4
	No	387	94.4
	I don't know	5	1.2
	Total	**410**	**100**
Do you know anyone who is sickle cell carrier?	Yes	108	26.3
	No	204	49.8
	I don't know	98	23.9
	Total	**410**	**100**
Are you a sickle cell carrier?	Yes	43	10.5
	No	328	80
	I don't know	39	9.5
	Total	**410**	**100**

Figure 6: Bar-chart showed participants perception of SCD



Knowledge of participants about cause of sickle cell disease was measured; we found that more than 63% of participants know that it is an inherited disorder and more than half of participants had information that the disease runs in generations but can skip a generation sometimes. Regarding women with SCD who can get pregnant or not and if it affects the pregnancy and fetus, more than 60% of participants answered that a woman can get pregnant and nearly the same percent found that it affects the pregnancy (Table 3 & Figure 7).

Figure 7: Bar-chart showing participants knowledge about SCD

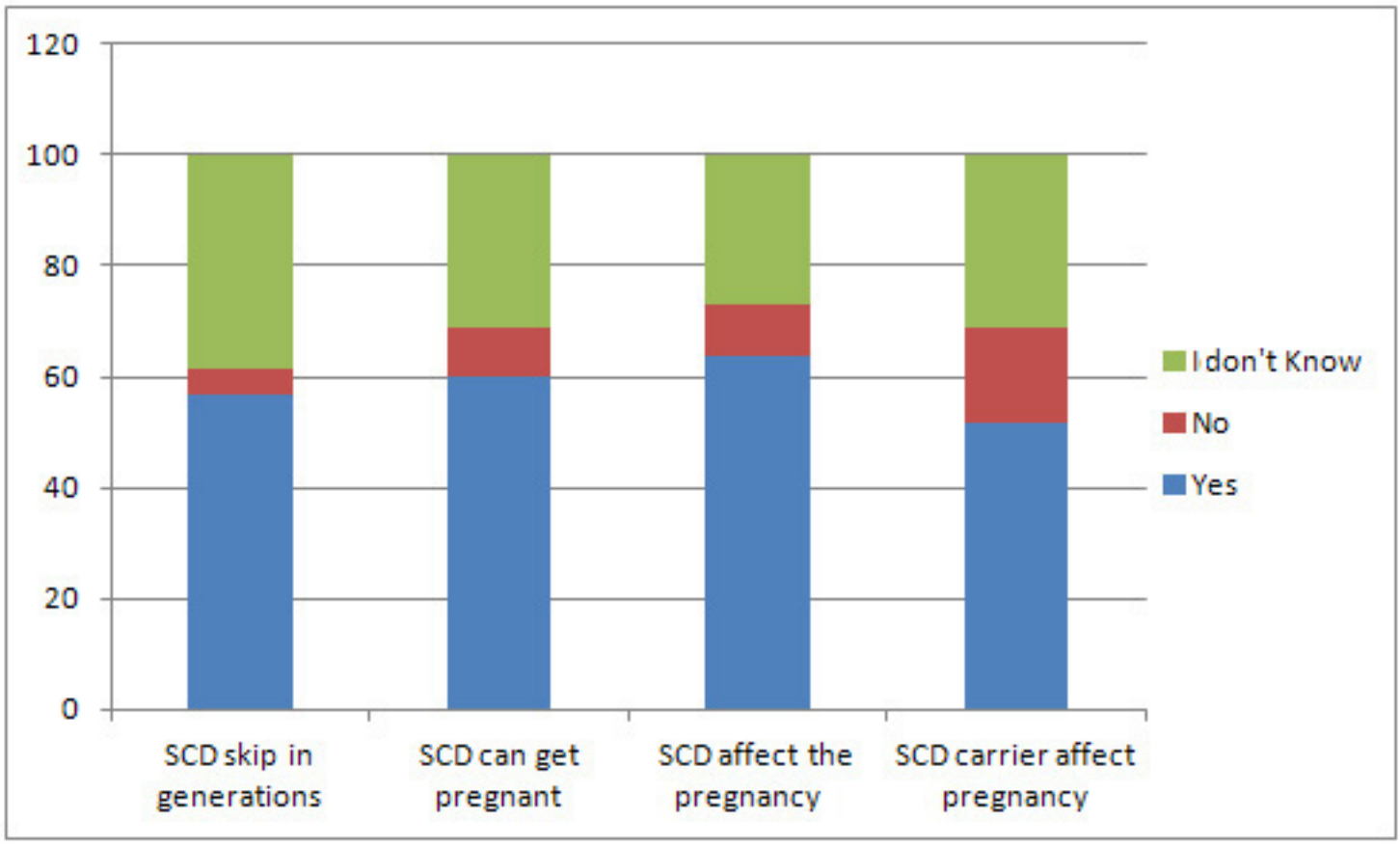


Table 3: Information of the studied subjects about inherited sickle cell disease

		No	%
How do you get Sickle cell disease?	Hereditary	259	63.2
	Acquired	41	10
	I don't know	110	26.8
	Total	**408**	**99.5**
Does Sickle cell disease sometimes skip generations in families?	Yes	233	56.8
	No	19	4.6
	I don't know	158	38.5
	Total	**409**	**99.8**
Do you think that women with sickle cell can get pregnant?	Yes	247	60.2
	No	36	8.8
	I don't know	127	31
	Total	**410**	**100.0**
Do you think that (sickle cell disease) affects the pregnant women?	Yes	261	63.7
	No	39	9.5
	I don't know	110	26.8
	Total	**410**	**100**
Do you think that (sickle cell trait) affects the pregnant women?	Yes	211	51.5
	No	71	17.3
	I don't know	128	31.2
	Total	**410**	**100**

Regarding participants' knowledge about sickle cell disease and its complications and how the pregnancy affects SCD, about 67.8% had previous experience that it affects the pregnancy by hematological complications, 23.4% by infection and 29.3% by the complication of blood transfusion. About the effect of SCD in pregnancy, 44.9% said that it may cause antepartum hemorrhage, 38% found it may affect fetus by causing intrauterine gross retardation (Table 4)

Table 4: Information of the studied subjects about sickle cell disease and its complications

		No	%
Which of the following are true of Sickle cell disease?	A blood disease	312	76.1
	Many types	92	22.4
	Identified by blood test	172	42
	Blood transfusion needed for treatment	120	29.3
How does the pregnancy affect the sickle cell disease?	Hematological complication	278	67.8
	Infection	96	23.4
	Blood complication	120	29.3
	Others	107	26.1
How does the sickle cell disease affect the pregnancy?	APH	184	44.9
	Gestational diabetes	49	12
	IUGR	156	38
	Eclampsia	83	20.2
	Pregnancy induced HPT	123	30
	Others	128	31.2

Regarding the participants' knowledge about how to deal with SCD patients, more than 76% found that they need plan for management and more than 80% said that they need special care during pregnancy and during delivery as investigation, regular follow-up, some medications and vaccinations, (Table 5).

Table 5: Information of the studied subjects about management of SCD

		No	%
Is it important to the affected women to plan and discuss the future pregnancy with the hematologist?	Yes	312	76.1
	No	19	4.6
	I don't know	79	19.3
	Total	**410**	**100**
Do you think pregnant women with sickle cell needs special care during her pregnancy?	Yes	347	84.6
	No	15	3.7
	I don't know	48	11.7
	Total	**410**	**100.0**
Do you think that if there is a special management done to the pregnant women with sickle cell during delivery?	Yes	358	87.3
	No	10	2.4
	I don't know	42	10.2
	Total	**410**	**100**

Regarding detection of the level of knowledge which was measured through the scoring applied we found that most of the participants had moderate knowledge about SCD (>60%) and there was no difference regarding socio-demographic characters.

Table 6: Association between levels of knowledge about sickle cell disease and Socio-demographic characteristics of the studied subjects

		Knowledge response		P-value
		Poor score	Good score <=35	
Age	20-30	200	41	0.681
	30-40	54	24	
	40-50	48	16	
	>50	20	7	
Gender	Female	220	155	0.782
	Male	30	7	
Marital Status	Single	89	28	0.230
	Married	165	53	
	Widow	8	3	
	Divorced	5	0	
Educational level	1ry school	2	0	0.681
	Intermediate school	7	2	
	High school	60	21	
	University	198	103	
	High education	10	7	
Occupation	Employee	104	41	0.361
	Un employee	35	13	
	Student	88	45	
	Housewife	64	20	

Discussion

SCD is a hemolytic anemia characterized by abnormally shaped (sickle) RBCs, which are removed from the circulation and destroyed at increased rates leading to anemia (1).

Pregnancy in SCD is at very high risk (14). Major steps for prevention is to carry out various programs, surveys, educating and increasing awareness toward the disease and its consequences including morbidity and mortality (11).

So, the aim of current study was to assess the awareness about complications of SCD during pregnancy in Jeddah city, Saudi Arabia.

The study sample included 410 participants, most of them female (91%) and 9% male. More than 50% of participants were aged between 20 to 30 years old and in about 59.9% their marital status was married. 73.4% were university students (Table 1, Figures 1-5).

Regarding perception of participants about SCD, it was found that the majority of them (89.5%) had heard about the disease, 44.4% heard about it from school. More than 66% of the participants did not know anyone with SCD, only 4.4% had the disease and 10.5% were known to be carrier as shown in Table 2 and Figure 6.

This is in agreement with the study conducted by Alturaifi et al., in which most (86.3%) of the study population had heard about SCD, and only 16 (3.8%) had previous experience with an SCD child (17).

Knowledge of participants about the cause of SCD was measured, and it was found that more than 63% of participants knew that it is an inherited disorder and more than half of the participants had information that the disease

runs in generations but can skip a generation sometimes. Regarding if women with SCD can get pregnant or not and if it affects the pregnancy and fetus, more than 60% of participants answered that a woman can get pregnant and nearly the same percentage found that it affects the pregnancy (Table 3 & Figure 7).

The above mentioned results were matched with the study performed by Alturaifi et al., who showed that most (77.8%) of the surveyed subjects knew that SCD is a hereditary disorder, and 254 (59.9%) subjects recognized that SCD sometimes skip generations in families (17).

Regarding participants' knowledge about sickle cell disease and its complications and how pregnancy affects SCD, about 67.8% had previous experience that it affects the pregnancy by hematological complications, 23.4% by infection and 29.3% by the complication of blood transfusion. About the effect of SCD in pregnancy, 44.9% said that it may cause antepartum hemorrhage, 38% found it may affect the fetus by causing intrauterine gross retardation (Table 4).

Similarly, Alturaifi et al., found that most (55.7%) of the respondents knew that SCD is a blood disease, and 74 (17.5%) stated that it could be identified by a blood test (17).

Also, it is consistent with the study conducted by Obed et al., who found that patients were most likely to answer correctly that SCD is a "blood disease" (130/206, 63.1%) (18).

Regarding the participants' knowledge about how to deal with SCD patients, more than 76% found that they need a management plan and more than 80% said that they need special care during pregnancy and during delivery such as investigation, regular follow-up, some medications and vaccinations, (Table 5).

Regarding detection of the level of knowledge which was measured through the scoring applied it was found that most of the participants had moderate knowledge about SCD (>60%) and there was no difference regarding socio-demographic characteristics (Table 6).

Our findings agreed with the results of Alturaifi et al., in which 51.4% of participants showed a good level of knowledge. However, our findings were in disagreement with the same study regarding the relationship between socio-demographic factors and level of knowledge where sex and education level had significant association with the level of knowledge ($p<0.05$) (17)

Consistent with a study in Bahrain by Al Arrayed and Al Hajeri, findings showed good level of knowledge about SCD among the public, while, findings were in contrast with them regarding the significant association of sex and education level with the level of knowledge (19).

In addition, Treadwell et al., reported that 68% of their study population responded correctly to knowledge questions about SCD(20).

In contrast, a low level of knowledge was reported among SCD patients in Al-Qatif area, Eastern Province, Saudi Arabia and secondary school students in Nigeria (21).

Furthermore, Siddiqui et al., revealed substantial knowledge gaps about sickle cells in surveyed people of reproductive age from the Dominican and African American communities in Northern Manhattan (22).

Conclusion

Overall knowledge about SCD and its complications during pregnancy was moderate. So, we recommend that health education programs about all aspects of SCD should be designed, implemented and evaluated among the general population.

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Non-Alcoholic Fatty Liver Disease Epidemic in Pakistan: Status, Challenges and way forward

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Pakistan is a developing country with limited resources facing a huge quadruple disease burden. Chronic liver disease is on the rise with serious consequences, for the patient, family and health delivery system in the country. Rise in the incidence of non-communicable diseases is related to lifestyle with lack of exercise, and increased use of calorie dense foods. With rise in incidence of metabolic syndrome and obesity, incidence of fatty liver is rapidly increasing in the population. It leads to chronic liver disease including cirrhosis and hepatocellular carcinoma(1, 2). This has far reaching adverse consequences for patients as well as the health care delivery system that has scarce resources to face this huge challenge.

Currently, fatty liver disease is present in the country in epidemic proportion (3,4,5). There is unfortunately, lack of awareness with regards to its high prevalence and serious adverse health related consequences, among patients as well as health care providers. There is a lack of clear cut government policy to face this epidemic. Medical colleges are not giving enough emphasis when educating and training health care providers in realizing the seriousness of this epidemic nor its serious long term adverse consequences. Our health delivery system is geared towards treating diseases when they are advanced, with lack of emphasis on prevention and health maintenance. A strong functional health care delivery system in general and primary health care in particular, are lacking(6). There is limited intervention that is available once liver cirrhosis sets in. With diet control, exercise and weight reduction, fatty liver epidemic can be controlled in the country as part of overall management of metabolic syndrome.

Changes facing us in dealing with fatty liver disease epidemic are several. We will need clear cut government policy and commitment to deal with this epidemic. A strong emphasis in medical colleges in educating and training healthcare providers is the need of the hour. A proactive preventive approach will have to be taken by all stakeholders in controlling metabolic syndrome through diet control, exercise and weight reduction. Screening, early diagnosis and treatment for diabetes, hypertension, and obesity will be required.

Media can play a very constructive role by educating and raising awareness among the general population as well as healthcare providers. Print and electronic media can play a positive role by publishing information on the subject. Social media including Facebook and WhatsApp can be utilized to raise awareness about fatty liver disease among the general population.

National organizations will have to play a role in controlling fatty liver disease. They can hold scientific events for healthcare providers and health awareness programs for the general public. They can mobilize public opinion to pressurize government and regulatory bodies to develop policy on controlling fatty liver disease and also commit resources for this purpose. A model of public-private partnership is needed to control rising prevalence of fatty liver disease. Government can provide regulatory control while the private sector can invest with appropriate guaranteed returns on investment (7).

Academia has a role to play in identifying issues related to fatty liver disease (8). Research is needed into models that work in local conditions. Barriers to diet control and exercise need to be identified and addressed. Resources will be required to address the rising prevalence of fatty liver disease in the country. In view of limited resources at hand, efficiency will have to be built in with development and implementation of models that offer better returns on investment.

It's high time that focused efforts are made by all stakeholders in combating the growing burden of fatty liver disease and its complications. Unless concerted measures are taken now, we will be faced with an overwhelming disease burden that our health care delivery system with limited resources will be unable to control.

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Vitamin D3 deficiency and early pregnancy loss

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Abstract

Vitamin D is important for reproductive health, and healthy pregnancy; its deficiency is related to many obstetrical complications. This study aimed to study the relation of Vitamin D deficiency and early pregnancy loss.

Subject and methods: A Retrospective Case control study was done in Azadi teaching Hospital during the period 1st January 2019-1st May 2019. Inclusion criteria was any pregnant women with singleton pregnancy in the 1st trimester;106 women with miscarriage in 1st trimester were enrolled and compared with 106 normal pregnancies enrolled as control. Exclusion criteria were any women with recurrent miscarriage, multiple pregnancy, TORCH infection, anemic patient, patients with medical diseases like diabetes, thyroid disease, antiphospholipid syndrome or any congenital abnormality of the uterus.

Results: The total sample showed that 186 (79.2%) were fully covered 182 (85.8%) with Vitamin D3 deficiency, 16 (7.5%) with insufficiency, and 14 (6.6%) had a normal level of Vitamin D3.

There are significant differences among both study groups regarding Gestational age in weeks, and 25-hydroxivitamin D levels. 25- hydroxivitamin D level was lower among those with miscarriage 11.3±5.3, than normal pregnancy 15.9±11.2. Gestational age (GA) among the miscarriage group was 8.6±2.1 lower than those with normal pregnancy 9.4±2.4.

Those with deficient 25- hydroxivitamin D level mostly had miscarriage 96 (52.7%), versus normal pregnancy 86 (47.3%); those with insufficient 25- hydroxivitamin D were commonly missed 10 (62.5%); those with normal level mostly had a normal pregnancy 14 (100%). Most of the covered women had miscarriage 140 (83.3%), which is lower than the deficiency level among uncovered women 42(95.5%).

Conclusion: Vitamin D deficiency was associated with early pregnancy loss. Sufficient vitamin D is important for healthy pregnancy.

Key words: Vitamin D, 25- hydroxivitamin D, early pregnancy loss

Introduction

Pregnancy loss (miscarriage) is a common complication of pregnancy. It has both a psychological and physical impact on the patient. The incidence of miscarriage is about 10-15% with the highest risk being in the first trimester of pregnancy [1].

The definition of spontaneous miscarriage is the loss of a pregnancy prior to viability. This is legally regarded in the United Kingdom as a gestation of 23 weeks and 6 days.[2]

However miscarriage has been defined by the World Health Organization, and the Center for Disease Control and prevention as any pregnancy loss before 20 weeks gestation, or a miscarried fetus less than 500 g weight [3]. Three or more consecutive miscarriages is defined as recurrent miscarriage and affects 1% of women and is regarded as predictive of high rates of future miscarriage [4].

Many causes have been identified for miscarriage; chromosomal anomaly accounts for about 50% of miscarriages, other risk factors that have been associated with miscarriage include: maternal and paternal age, congenital abnormality of uterus, history of infections, increase in body mass index, medical diseases like diabetes mellitus, thyroid disease, epilepsy, anti-phospholipid syndrome and heart disease, excess alcohol and caffeine consumption [5,6,7,8].

Because miscarriage has great psychological and physical impact on the health of women [9] it is important to look for other risk factors that may affect the rate of miscarriage in the first trimester of pregnancy when miscarriage is the commonest.

Vitamin D is important for normal reproductive health; Vitamin D receptors have been found in the ovary, uterus, placenta, hypothalamus, and pituitary gland [10].

Poor vitamin D status during pregnancy has been associated with preeclampsia, [11] gestational diabetes, [12] bacterial vaginosis, and compromised intrauterine growth [13]. Little has been reported in Iraq about the association of vitamin D deficiency and miscarriage in the 1st trimester. This study aimed to study the association of spontaneous pregnancy loss in the 1st trimester and Vitamin D deficiency.

Subjects and method

A retrospective Case control study was done in Azadi Teaching Hospital during the period 1st January 2019-1st May 2019.

Inclusion criteria was any pregnant woman with singleton pregnancy with gestational age from 6 weeks till 13 completed weeks in the 1st trimester. 106 women with miscarriage in 1st trimester were enrolled and compared with 106 normal pregnancies enrolled as control.
Exclusion criteria were any women with recurrent miscarriage, TORCH infection, anemic patient, medical disease such as diabetes and thyroid disease, antiphospholipid syndrome, multiple pregnancy and congenital anomaly of uterus.

Measurement of serum 25(OH) D
Blood samples from fasting women were collected from women with normal pregnancy at 1st trimester, as well as from women with spontaneous miscarriage in 1st trimester. After centrifugation for 10 minutes at 3000r.p.m. at room temperature, the serum specimens were stored at −80°C. Before assaying, all samples were thawed to room temperature and assayed on the same day to avoid inter-assay variation. Quantitation of serum 25(OH)D was performed using commercial ELISA kits.

The intra-assay and inter-assay precision for the ELISA were less than 10% and 15% for 25(OH)D. All the assays were performed according to the manufacturer's instruction. Biological samples were blinded prior to analyses.
Serum levels of 25- hydroxivitamine D is defined as: sufficient = 30 ng/ml 25(OH), values between insufficiency= 29 and 20 ng/ml, deficiency= less than 20 ng/ml, severe deficiency= below 7 ng/ml. [14]

Results

In analyzing samples of 106 women with miscarriage compared with 106 women with normal pregnancy, the total sample showed that 186 (79.2%) were covered women, 182 (85.8%) with Vit D3 deficiency, 16 (7.5%) with insufficiency, and 14 (6.6%) had normal level of Vit D3.

There are significant differences among both study groups regarding Gestational age in weeks, and 25- hydroxivitamin D levels. 25- hydroxivitamin D level was lower among those with miscarriage 11.3±5.3, than normal pregnancy 15.9±11.2. Gestational age (GA) among the miscarriage group was 8.6±2.1, which was lower than those with normal pregnancy 9.4±2.4, as shown in Table 1.

Table 1: The relation between different variables and type of pregnancy outcome.

	Normal pregnancy		Miscarriage		P value
	Mean	Std. Deviation	Mean	Std. Deviation	
Body mass index by Kg/square meter	26.3	3.5	26.8	4.6	NS
Gravidity	2.9	1.6	2.9	1.7	NS
Parity	1.4	1.2	1.6	1.5	NS
Miscarriage	0.5	0.7	0.4	0.6	NS
Gestational age in weeks	9.4	2.4	8.6	2.1	Significant
25- hydroxivitamin D (ng/ml)	15.9	11.2	11.3	5.3	Significant

Those with deficient 25- hydroxivitamine D level mostly had miscarriage 96 (52.7%), versus those with normal pregnancy 86 (47.3%), those with insufficient 25- hydroxivitamin D were commonly missed 10 (62.5%), those with normal level mostly had normal pregnancy 14 (100%). This relation was statistically significant (P value < 0.05), as shown in Table 2.

Table 2: The relation between Vit D level and pregnancy outcome

25- hydroxivitamin D (ng/ml)	Type of pregnancy		Total
	Missed	Normal	
8-20 ng/ml	96	86	182
	52.70%	47.30%	100.00%
20-29 ng/ml	10	6	16
	62.50%	37.50%	100.00%
>30ng/ml	0	14	14
	0.00%	100.00%	100.00%
Total	106	106	212
	50.00%	50.00%	100.00%

X2=15.5, df=2, P value <0.05 Significant

Most of the covered women had miscarriage 140 (83.3%), which is lower than the deficiency level among uncovered women 42 (95.5%). This relation was statistically not significant as shown in Table 3.

Table 3: The relation between 25- hydroxivitamin D level and women's dressing

	8-20 ng/ml	20-29 ng/ml	>30ng/ml	Total
Covered	140	16	12	168
	83.30%	9.50%	7.10%	100.00%
Uncovered	42	0	2	44
	95.50%	0.00%	4.50%	100.00%
Total	182	16	14	212
	85.80%	7.50%	6.60%	100.00%

X2=5.14, df=2, P value >0.05 not Significant

Discussion

Vitamin D has an important role in reproductive health and its deficiency is related to many obstetrical complications, such as: bacterial vaginosis, preeclampsia, gestational diabetes, small-for-gestational age births, and pregnancy loss [12,15-17].

This study revealed that most of the sample had vitamin deficiency 182(85.8%). This goes with the study of Hantoosh H. A. et al that goes with previous studies done among reproductive age group women (76%)[18], and Al-Hilali KA (65%)[19] and is supported by studies in Iran (26.1%) [20], (33%) [21].

Those with deficient 25- hydroxivitamin D level mostly had miscarriage 96 (52.7%), versus those with normal pregnancy 86 (47.3%); 25- hydroxivitamin D level was lower among those with miscarriage 11.3±5.3, than normal pregnancy 15.9±11.2. This goes with a study in Iraq that found that 60% of those with recurrent pregnancy loss had vitamin D deficiency, with a mean of 21.5±11.8.[22]

In Iran it was found that (33%) of those with recurrent pregnancy loss had Vitamin D deficiency,[21] and, in Hou W et al [23] (43.3%) women with pregnancy loss had Vitamin D deficiency, and (3.3%) in the normal pregnant group.

Mumford SL et al [24] in a prospective cohort study found that sufficient preconception serum level of Vitamin D was associated with lower rate of pregnancy loss.

In this study the mean 25- hydroxivitamin D level was lower among those with miscarriage 11.3±5.3, than normal pregnancy 15.9±11.2. This goes along with Hou W [23] that found significant lower level of Vitamin D among those with pregnancy loss than those with normal pregnancy. The mean 25(OH)D concentration was 49.32±11.65 ng/ml for the normal pregnant group, and 34.49±15.60 ng/ml for the pregnancy loss group,

Results of a study in Iraq represent that the mean serum Vitamin D level was 15.85 ± 7.69 among reproductive age women[18].

This difference in the mean levels is due to the fact that Hypovitaminosis D is prevalent in the MENA region [25]. Most of the covered and uncovered women had miscarriage rate of 140 (83.3%) and 42(95.5%) respectively. This figure shows the overall high percentage of Vitamin D deficiency among reproductive age women [2].

The explanation of high prevalence may be explained by the preference of Iraqi women to have fair skin tone, and the hot sunny weather makes them avoid exposure to sun light.

The significant association between miscarriage and serum Vitamin deficiency is understood by reviewing the results of previous studies that studied the effect of Vitamin D. Vitamin D has roles in reproductive health and pregnancy outcome. These effects are: regulation of decidualization of the uterus, by regulating HOXA10 gene responsible for endometrial development and receptivity during the window of implantation[26]. It has a role in trophoblastic invasion and angiogenesis, therefore it is responsible for embryo implantation and placenta function [27-29].

Vitamin D deficiency is associated with autoimmunity, inflammation, and intolerance of the maternal immune system to the embryo [30].

Conclusion

Vitamin D deficiency was associated with early pregnancy loss. Sufficient vitamin D is important for healthy pregnancy.

Ethical approval

Ethical clearance was taken from Kirkuk health department / research ethical committee.

This study was self-funded. No Conflict of Interest.

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Obstetric violence experienced during child birth in Taif city, Saudi Arabia

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Abstract

Background: Mistreatment during child birth leads to adverse maternal and obstetric outcomes.
Objectives: The aim of the present study was to evaluate obstetric violence in Saudi maternal health-care settings.

Materials and methods: A cross-sectional study was conducted at the post-natal clinics of maternity hospital of King Faisal medical complex and Al-Hada armed forces hospital, Taif city, Saudi Arabia. Participants were recruited after thorough non-probability consecutive sampling technique. Data on socio demographic and maternal characteristics, obstetric violence and experience of last delivery were collected.

Results: The data of three hundred and fifty eight participants were analysed. The mean (SD) age of women who participated in this study was 33.14 (7.17) years. Around forty seven percent of the study participants responded that staff members did not allow the presence of any relative during child birth. The most predominant physical abuse reported were staff members were not gentle/ painful vaginal examination during child birth (24.9%), followed by staff members who pressed abdomen forcefully during child birth (21.8%), and those who stitched the episiotomy without anesthesia (13.4%). Related to non-confidential care, staff members discussed their private health information in public (11.5%) and to others/ relatives (10.1%). There were sixty-eight (19%) of women who responded that staff members did episiotomy without consent. Around seventy percent of the study participants rated their experience of their last delivery as excellent or good.

Conclusion: Non-dignified care was experienced by women during pregnancy as an invasive procedure and medication was not necessarily used, confidentiality was breached, they faced physical violence to a considerable extent and pregnant women's needs were neglected.

Key words: Obstetric, violence, child, birth, Taif, Saudi Arabia

Introduction

Access to secure and high quality sexual and reproductive health service is an essential right of every women as provision of these services with quality standards can make a significant contribution in reducing maternal morbidity and mortality [1]. Thus, all women have the right of access to high quality healthcare, which should be respectful, dignified, and free of any violence and discrimination. During child birth any abuse, negligence and disrespectful behavior is a serious violation of fundamental human rights and is recognized globally as such [2].

Since the last decade, numerous research has been conducted to identify mistreatment during facility-based child birth, considering it a significant and urgent issue that affects women globally [3]. Different phrases for mistreatment during child birth had been used i.e. "disrespect and abuse", "mistreatment of women during the facility-based child birth" and "obstetric violence" [4]. Obstetric violence is a more commonly used term with Venezuela being the first country to employ this terminology in the year 2007; within its "Organic Law on the Right of Women to a Life Free of Violence [5]. It was defined as violence being faced by women during pregnancy, child birth and the post-partum period [5]. The World Health Organisation (WHO) has stated obstetric violence as "abuse, neglect or disrespect during child birth can amount to a violation of a woman's fundamental right" [6].

A wide array of violent practices have been identified through comprehensive review of evidence that included; physical abuse, verbal abuse or humiliation, non-consented care, non-confidential care, non-dignified care, discrimination due to a specific patient's attributes, abandoning care due to failure to pay, detention of facilities, forced to use unnecessary medication or invasive procedure and lack of informed consent for examinations/ treatment/ invasive procedure [7].

Obstetric violence has severe consequences. It could lead to both physical and psychological harm to women as well as their child [8]. The adverse outcomes extend from gynecological and obstetric consequences i.e. unwanted pregnancies, prenatal retardation, abortion, low birth weight or prematurity, pre-term labor and fetal loss [9-12].

Women victimized by obstetric violence could suffer from chronic pelvic pain, headache, depression, anxiety, suicide attempt and post-traumatic stress disorder [13,14]. More serious consequences have been reported such as bleeding and interruption of pregnancy [14].

Obstetric violence had been predominantly researched in developing countries i.e. Ecuador, India and Sri Lanka with scarce health resources, gender inequalities, and ethical protocols not followed [15-17]. However, obstetric violence is not an underlined phenomenon and is a relevant problem in developed countries [18,19]. There is a paucity of information related to obstetric violence in Saudi maternal health clinics. Considering the significance of the problem, it was deemed essential to identify obstetric violence, disrespectful maternity care and physical abuse, negligence of patient privacy and non-consented care, and inappropriate use of medication and invasive procedures.

Materials and methods

Study design and time frame: A descriptive cross-sectional study was conducted from September 2018 to March 2019.

Study setting: The study was carried out at the post-natal clinics of Maternity Hospital of King Faisal Medical Complex and Alhada Armed Forces Hospital, Taif city, Saudi Arabia.

Sampling and data collection: Married women aged greater than 18 years and having at least one child were invited to participate in this research through non-probability consecutive sampling technique. Participants having psychiatric illness, speech defects, medical/surgical illness and non-willingness to give written informed consent were excluded.

Study instrument: Primary data was collected using a structured questionnaire from study participants recruited in this research through face to face interview. The structured closed ended questionnaire consisted of three parts; the first part collected information on socio demographic and maternal characteristics of the study participants, the second part enquired about obstetric violence and the third part enquired about study participant's experience of last delivery. The pilot testing of the questionnaire was performed by recruiting thirty participants and the results of the pilot study were discarded and were not used in original study.

The socio demographic information collected was age in years, nationality (Saudi and Non-Saudi), residence (rural or urban), household income and education. The maternal characteristics enquired of were number of children and age at marriage in years.

The second part of the questionnaire enquired about obstetric violence. The questionnaire used was developed by three researchers considering Saudi and American guidelines for obstetric violence. The face validity of the questionnaire was checked. The questionnaire was initially translated to Arabic and then back translation to English was performed. The Arabic version of the questionnaire was used in this current research. The Obstetric Violence part of the questionnaire collected information on nine domains related to non-dignified care, unnecessary invasive procedure, unnecessary use of medication, neglecting women's needs, physical abuse, confidentiality, neglecting patient privacy, non-consented care and inappropriate demands for payments. The items in each domain were as follows; non-dignified care (7 questions), unnecessary invasive procedure (3 questions), unnecessary use of medication (1 question), neglecting women's needs (6 questions), physical abuse

(6 questions), confidentiality (2 questions), neglecting patient privacy (2 questions), non consented care (5 questions) and inappropriate demands for payments (2 questions). Thus, the total number of questions was 34. All questions had a binary response option as Yes or No. Finally, the last part of the questionnaire enquired about experience of last delivery; with response option as Excellent, Good, Acceptable and Bad.

Ethical Considerations: The study was conducted according to the ethical guidelines of the Helsinki declaration. Written informed consent was obtained from all the participants prior to enrolling in this research. The study participants were comprehensively briefed about research objective, process involved, and potential risks and benefits of enrolling in this research. The participation in this research was voluntary with participants having the right to withdraw at any point during the research as well as the right not to respond to any question. The anonymity and confidentiality of the study participant's responses was maintained throughout the research. No personal details (i.e. name and contact number) were collected. The study was initiated after the ethical approval was granted by the Institutional Review Board (IRB) committee of the College of Medicine, Taif University, Saudi Arabia.

Data analysis: The data analysis was performed using the Statistical Software, SPSS version 22 (IBM). The data was entered into the software and was checked twice to correct for incorrect entries. Descriptive statistics was performed. Quantitative data was presented as Mean ± Standard deviation while the qualitative data was presented as frequency/percentage.

Results

The present study recruited four hundred participants, but forty-two questionnaires were excluded due to missing data and incomplete information. The data of three hundred and fifty-eight participants were analysed and the response distribution was 89.5%.

(Table 1) gives details about the socio demographic and maternal characteristics of the study participants. The mean (SD) age of women who participated in this study was 33.14 (7.17) years. The majority of study participants were less than or equal to 30 years (40.8%), followed by 31-35 years (24.6%) and the least great group more than thirty five years (34.6%). Furthermore, slightly less than ninety seven percent of the study participants were Saudi nationals. Moreover, two hundred and ninety-eight women (83.2%) belonged to rural areas.

Around ninety percent had a household income of 5,000 to 10,000 SAR, twenty-five (7%) had household income of less than 5,000 SAR and only ten study participants (2.8%) reported household income greater than 10,000 SAR. Predominantly, the majority (53.4%) of the study participants were graduates, followed by high school (23.7%), middle (8.9%), primary (5%), illiterate (4.5%) and master/ doctoral (4.5%).

The mean (SD) number of children was 2.97 (1.79), with the majority having 2 to 4 children (54.5%). Around one quarter (25.4%) had one child and one fifth (20.1%) had more than four children. The mean (SD) age at marriage was 22.88 (4.14) years. The majority, one hundred and forty (39.1%) of the study participants had marriage at age 21 to 25 years, around thirty five percent had marriage at age less than or equal to 20 years and around one quarter (25.7%) had age greater than twenty-six years.

Table 2 gives details of study participant's responses on non-dignified care and unnecessary use of invasive procedure and medication by staff members. When asked about non-dignified care, there were seventy-six (21.2%) who reported having faced shouting or scolding from staff members during child birth, seventy three (20.4%) faced any negative or threatening comments from staff members during their child birth, sixty five (18.2%) responded that staff members blamed them during child birth. Moreover, around one fifth (20.9%) of the women responded that staff members refused to give pain killers during child birth and more than one quarter (26.3%) of women replied that staff members made them wait for a long time until getting medical care. However, only nineteen study participants (5.3%) responded to having faced any threat to withhold treatment from staff members during their child birth and thirteen (3.6%) reported being treated by staff members with racism due to social/ economic/ health status or race and religion.

Importantly, when asked about unnecessary invasive procedure; eighty two (22.9%) reported that staff members did episiotomy without medical need, eighteen (5%) of the participants responded that staff members used forceps delivery/vacuum extractor without medical needs, while only eight (2.2%) of the study participants were of the view that staff members did cesarean section without medical need. Moreover, there were forty-one (11.5%) study participants who reported that staff members gave labor induction medication without medical need.

Table 3 entails details about study participant response on neglecting women's needs and physical abuse by staff members. There were one hundred and sixty seven (46.6%) of the study participants who responded that staff members refused the presence of any relative during child birth, followed by sixty six women (18.4%) who believed they faced ignorance for assistance requests from staff members during child birth; staff members ignored their choice of delivery position (15.1%), staff members deprived them of food and drink (11.2%), they were not attended to during child birth by a staff member (10.9%) and being treated by a staff member as a passive participant during child birth (6.4%).

The study participants were also asked about the physical abuse; the most predominant were staff members who did not-gentle/painful vaginal examination during child birth (24.9%), followed by staff members who pressed abdomen 'forcefully' during child birth (21.8%), who stitched the episiotomy without anesthesia (13.4%), who faced hitting,

slapping, pushing or pinching from staff members during child birth (4.5%) and only nine (2.5%) responded that staff members used any kind of mouth muzzle or restricted them in bed during child birth. Importantly, there was only one (0.3%) of the study participants who faced any kind of sexual abuse from staff members during child birth.

Table 4 gives details about the study participant's responses on confidentiality, privacy, informed consent and inappropriate payment demand by the staff members.

According to the non-confidential care, there were forty-one (11.5%) of women who responded that staff members discussed their private health information in public and thirty six (10.1%) were of the view that staff members shared their health information to others/relatives. When asked about neglecting patient privacy, there were forty (11.2%) who responded that their body was seen by others (non-staff members) during child birth and twenty (5.6%) were in the delivery room without curtains between beds. Of the women enrolled in this research when asked about non consented care; there were sixty eight (19%) of women who responded that staff members did episiotomy without consent, (4.5%), staff members used forceps delivery/ vacuum extractor without consent caesarean section was performed by staff member during child birth with consent (3.6%) and staff members did tubal ligation during child birth without consent (1.4%). Importantly, there was one women (0.3%) who reported that hysterectomy was performed by a staff member during caesarean section without consent.

Finally, when inappropriate demands for payments were enquired about there were nine (2.5%) women who responded that staff members requested bribes/informal payments during child birth and five (1.4%) women reported that the baby was held at the facility due to failure to pay after child birth.

Figure 1 gives details of the study participant's responses on experience of last delivery. There were one hundred and twenty-seven (35.5%) women who rated their experience of last delivery as excellent, followed by one hundred and twenty-three (34.4%) who considered it good and sixty nine women (19.3%) who reported it as being acceptable. Importantly, there were thirty-nine (10.9%) of the study participants who rated their experience of last delivery as bad.

Figure 1: Study Participants Response on Experience of Last Delivery (N = 358)

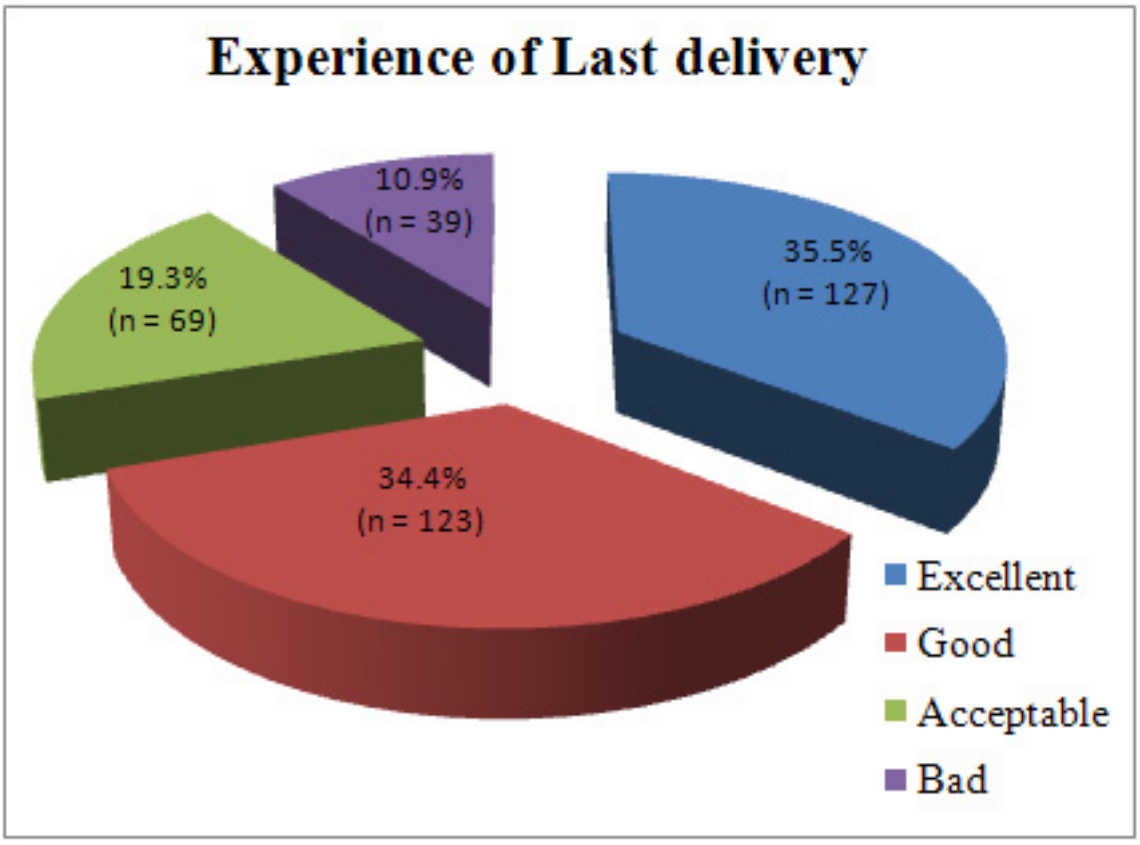

Table 1: Socio demographic and Maternal Characteristics of the Study Participants (N = 358)

Socio demographic and Maternal Characteristics	Mean ± SD/ n (%)
Age in years	33.14 ± 7.17
Age Categories (Years)	
≤ 30 years	146 (40.8)
31 – 35 years	88 (24.6)
> 35 years	124 (34.6)
Nationality	
Saudi	346 (96.6)
Non-Saudi	12 (3.4)
Residence	
Rural	298 (83.2)
Urban	60 (16.8)
Household Income	
Less than 5,000 Saudi Riyal	25 (7)
5,000 to 10,000 Saudi Riyal	323 (90.2)
More than 10,000 Saudi Riyal	10 (2.8)
Education	
Illiterate	16 (4.5)
Primary	18 (5)
Middle	32 (8.9)
High School	85 (23.7)
Graduate	191 (53.4)
Master/ Doctoral	16 (4.5)
Number of children	2.97 ± 1.79
Number of children categories	
1	91 (25.4)
2- 4	195 (54.5)
> 4	72 (20.1)
Age at marriage (years)	22.88 ± 4.14
Marriage Age categories (years)	
≤ 20 years	126 (35.2)
21 – 25	140 (39.1)
> 26 years	92 (25.7)

Table 2: Study Participants Response on Non-dignified care, Use of Unnecessary Invasive Procedure and Medication by Staff Members (N = 358)

Non-dignified care, Use of Unnecessary Invasive Procedure and Medication	n (%)
Non-dignified Care	
Faced any shouting or scolding from staff members during your child birth	
Yes	76 (21.2)
No	282 (78.8)
Faced any threat to withhold treatment from staff members during your child birth	
Yes	19 (5.3)
No	339 (94.7)
Faced any negative or threatening comments from staff members during your child birth	
Yes	73 (20.4)
No	285 (79.6)
Staff members blamed you during your child birth	
Yes	65 (18.2)
No	293 (81.8)
Staff members refused to give you pain killers during your child birth	
Yes	75 (20.9)
No	283 (79.1)
Staff members let you wait for a long time until you got the medical care	
Yes	94 (26.3)
No	264 (73.7)
Staff members treated you with racism for your Social status/economic status/Health status/Race or religion	
Yes	13 (3.6)
No	345 (96.4)
Unnecessary Invasive Procedure	
Staff members did episiotomy without medical need	
Yes	82 (22.9)
No	276 (77.1)
Staff members did cesarean without medical need	
Yes	8 (2.2)
No	350 (97.8)
Staff members used forceps delivery/vacuum extractor without medical needs	
Yes	18 (5)
No	350 (95)
Unnecessary Use of Medication	
Staff members gave you labor induction medication without medical need	
Yes	41 (11.5)
No	317 (88.5)

Table 3: Study Participants Response on Neglecting Women Needs and Physical Abuse by Staff Members (N = 358)

Neglecting Women Needs and Physical Abuse	n (%)
Neglecting Women Needs	
Faced any ignorance for your assistance requests from staff members during your child birth	
Yes	66 (18.4)
No	292 (81.6)
Staff member not attended you during child birth	
Yes	39 (10.9)
No	319 (89.1)
Staff members ignored your choice in delivery position	
Yes	54 (15.1)
No	304 (84.9)
Staff members refused the presence of any relative during your child birth	
Yes	167 (46.6)
No	191 (53.4)
Staff members deprived you of food and drinks	
Yes	40 (11.2)
No	318 (88.8)
Staff members treated you as passive participant during your child birth	
Yes	23 (6.4)
No	335 (93.6)
Physical Abuse	
Faced any hitting, slapping, pushing or pinching from staff members during your child birth	
Yes	16 (4.5)
No	342 (95.5)
Faced any kind of sexual abuse from staff members during your child birth	
Yes	1 (0.3)
No	357 (99.7)
Staff members stitching your episiotomy without anesthesia	
Yes	48 (13.4)
No	310 (86.6)
Staff members used any kind of mouth muzzle or restricted you in bed during your child birth	
Yes	9 (2.5)
No	349 (97.5)
Staff members pressed your abdomen forcefully during your child birth?	
Yes	78 (21.8)
No	280 (78.2)
Staff members did non-gentle/ painful vaginal examination during your child birth?	
Yes	89 (24.9)
No	269 (75.1)

Table 4: Study Participants Response on Confidentiality, Privacy, Informed Consent and Inappropriate Payment Demands by Staff Members (N = 358)

Confidentiality, Privacy, Informed Consent and Inappropriate Payment Demands	n (%)
Non Confidential Care	
Staff members discussed your private health information in public	
Yes	41 (11.5)
No	317 (88.5)
Staff members shared your health information to others/relatives	
Yes	36 (10.1)
No	322 (89.9)
Neglect Patient Privacy	
Was your body seen by others (not staff members) during your child birth	
Yes	40 (11.2)
No	318 (88.8)
Were you in delivery room without curtains between beds	
Yes	20 (5.6)
No	338 (94.4)
Non Consented Care	
Staff members did tubal ligation during child birth without consent	
Yes	5 (1.4)
No	353 (98.6)
Staff members did caesarean during your child birth without consent	
Yes	13 (3.6)
No	345 (96.4)
Staff members did hysterectomy during caesarean section without consent	
Yes	1 (0.3)
No	357 (99.7)
Staff members did episiotomy without consent	
Yes	68 (19)
No	290 (81)
Staff members used forceps delivery /vacuum extractor without consent	
Yes	16 (4.5)
No	342 (95.5)
Inappropriate Demands for Payments	
Staff members requested bribes/informal payments from you during your child birth	
Yes	9 (2.5)
No	349 (97.5)
Were you or your baby held at facility due to failure to pay after your child birth?	
Yes	5 (1.4)
No	353 (98.6)

Discussion

The present descriptive cross-sectional study was conducted to identify obstetric violence, disrespectful maternity care and physical abuse, negligence of patient privacy and non-consented care, and inappropriate use of medication and invasive procedure during child birth in two medical facilities of Taif city, Saudi Arabia. The results of the present study were of extreme importance to design educational programs and public awareness regarding women's rights of access to considerate and respectful care during child birth.

The results of the present study highlighted that more than one quarter (26.3%) of women had to wait a long time before getting medical care by staff members. Moreover, around twenty one percent of women faced shouting and scolding and around one fifth (20.2%) faced threatening comments by staff members during child birth. The findings highlighted the non-dignified care being experienced by the study participants. The physical abuse was also found to be prevalent as staff members did not-gentle/ painful vaginal examination during child birth (24.9%), followed by staff members who pressed abdomen forcefully during child birth (21.8%) and stitched the episiotomy without anesthesia (13.4%).

The study findings are consistent with the evidence in the literature. The study findings also reported that episiotomy was done without medical need among twenty three percent of participants and around twelve percent of participants received labor induction medication without medical need. The findings highlighted the unnecessary use of invasive procedure and medication. A cross-sectional population based study that recruited 4,275 women was conducted in Pelotas, Brazil and reported that at least one type of disrespect was experienced by 18.3% of mothers; verbal abuse (10%), denial of care as 6%, undesirable and inappropriate procedure (6%) and physical abuse as 5% [20]. A study from Kenya reported that every one fifth (20%) of the women experienced abuse by the healthcare professional during labor [21].

The study findings reported non-confidential care (8.5%), non-dignified care (18%), neglect or abandonment (14.3%), non-consensual care (4.3%) physical abuse (4.2%) and detainment for non-payment of fees as (8.1%) [21]. A cross-sectional study from Nigeria reported that non-consented services (54.5%) and physical abuse (35.7%) were the most common types of disrespectful behavior being faced during child birth [22]. A study from Venezuela reported that 49.4% women giving birth experienced some form of mistreatment from healthcare professionals [23]. A survey conducted at three Mexican hospitals reported that 11% of mothers experienced obstetric violence [24]. A study from Brazil that recruited participants from both public and private sector hospitals reported the prevalence of obstetric violence experienced by pregnant mothers as 25%. A study reported that among 120 women who delivered for the first time, more than half (51.7%) had an episiotomy while at the second stage of labor, and uterine fundus pressure was performed among 20% of women [25]. However, a recent study reported that unlike routine episiotomy, selective episiotomy is far more unlikely to cause charges of obstetric violence against operators, but its indication is far from consistent and efforts are required for a more clearly defined indication by scientific societies [26].

Importantly, the current study reported that slightly less than fifty percent (46.6%) of the study participants were refused the presence of any relative during child birth by staff members thereby neglecting important pregnant women's needs. A qualitative study reported that women greatly value companionship and social support in labor [27]. A study from Turkey reported that women who could not receive the necessary support needed more spousal support [28]. The meta-analysis result also demonstrated that women preferred someone they were familiar and comfortable with and continuous support during child birth was most valued by women [29].

The present study also reported that related to non-confidential care, around twelve percent of women responded that staff members discussed their private health information in public and slightly less than ten percent were of the view that staff members shared their health information to others/relatives. The study from Nigeria also highlighted a higher prevalence of non-dignified care which was reported by slightly less than 30% of women, abandonment/neglect during childbirth by around 29%, non-confidential care by 26%, detention in the health facility by 22%, and discrimination by one fifth as around 20% [22]. However, in the meta-analysis recently published from another African country, Ethiopia reported that the non-confidential care during child birth and maternity care was 14.1% only, with 95% confidence interval in the range of 7.3 to 25.4 [30].

Limitations

The present study conducted had certain limitations. Firstly, the study was conducted at only two maternal care facilities of Taif city, Saudi Arabia. Secondly, the small sample size. Thirdly, the use of the cross-sectional study could have a recall bias. Fourthly, the findings should be interpreted with caution as study participants could have over-reported or under-reported for various questions related to obstetric violence. Finally, being a quantitative research, future qualitative research through open ended questions and focus group discussion could give more detailed insight about obstetric violence.

Conclusion

There were around seventy percent of the study participants who rated their experience of their last delivery as excellent or good, however slightly less than twenty percent (19.3%) considered it acceptable and around eleven percent (10.9%) reported it as bad. The obstetric violence and disrespect/ abuse during child birth were found to be considerably high, therefore special attention and focus is desirable from the Ministry for Health (MOH), Saudi Arabia. The staff should be trained through Continuing Medical Education (CME) to avoid mistreatment during pregnancy and maintain highest ethical standards. More strict laws with implementation against mistreatment should be formulated. There is a need for more public awareness through media campaigns, placing brochures at maternal health clinics and informing pregnant women about their rights to receive high quality care.

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Conflicts of interest
There are no conflicts of interest.

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Knowledge about diabetic ketoacidosis among parents of type 1 diabetic children

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Abstract

Aim of Study: To assess knowledge of parents of type 1 diabetes mellitus (T1DM) children about diabetic ketoacidosis (DKA).

Methodology: A cross-sectional study was conducted among 385 parents of T1DM children attending the Diabetes Center in Abha City. A questionnaire was designed in simple Arabic Language by the researcher. It included personal data and knowledge about DKA.

Results: More than one-third of parents (37.9%) had poor grade of knowledge regarding DKA. Their main knowledge deficits were related to normal range of fasting and post-prandial blood sugar, normal range for HbA1c, when the diabetic child should see a doctor and causes of DKA. Characteristics that were significantly associated with lower parents' knowledge included being a father, aged >40 years, less than university educated, unemployed or those whose occupation was not healthcare-related, and having a monthly income <5000 SR.

Conclusions: Parents' knowledge about DKA is suboptimal. Some characteristics are significantly associated with lower knowledge regarding diabetes and diabetic ketoacidosis, i.e., being a father of a diabetic child, older parents, being less educated or unemployed parents, those whose occupation is not healthcare-related, having low monthly income and having diabetic siblings.

Recommendations: Health education to T1DM patients and their guardians should be fulfilled. It must cover information related to independent management of diabetes and diabetic ketoacidosis and how to identify symptoms of DKA.

Key words: Type 1 diabetes mellitus, diabetic ketoacidosis, parents' knowledge, health education.

Introduction

During childhood and adolescence, type 1 diabetes mellitus (T1DM) is the most common endocrine-metabolic disorder (1-2). Almost one in 300 youth develop type 1 diabetes (3). Worldwide, it has been reported that the incidence of type 1 diabetes is increasing by 3-4% per year (4).

Diabetic ketoacidosis (DKA) usually occurs as a result of insulin deficiency. It is a serious acute complication of DM, which accounts for most hospitalizations due to severe insulin deficiency (5). It consists of the biochemical triad of ketonemia, hyperglycemia and acidemia (6). Among children, the criteria for diagnosis of DKA include blood glucose above 11 mmol/L, venous pH less than 7.3, or bicarbonate less than 15 mmol/L, and ketonemia with ketonuria [7].

The incidence of DKA is difficult to establish, but it continues to increase, accounting for about 140,000 hospitalizations in the US in 2009 and more than 500,000 hospital days per year (8). Despite the promising statistics and raised awareness, prevalence of DKA continues to be as high as 30% in children with type 1 diabetes (9).

Several risk factors for DKA have been reported. In Al-Baha, Saudi Arabia, Satti et al. (1) noted that the incidence of DKA increases with increasing diabetic child's age, reaching its maximum during preadolescence and adolescence. Similarly, in Leicester, UK, Skinner (10) reported that the incidence of DKA peaked during adolescence.

In Germany, Neu et al. (11) reported that the frequency of DKA is higher among diabetic girls than that among diabetic boys. Similarly, in Saudi Arabia, Hamed (12), in Al-Madina Region, reported a higher incidence of DKA among females (58.7%) than males (41.3%). Moreover, Satti et al. (1), in Al-Baha reported a female to male ratio of 1.22:1.

Satti et al. (1) found first degree consanguinity among 27.5% of parents of diabetic ketoacidotic children. Moreover, 74% of their admitted children with DKA had positive family history of diabetes, of whom 52.5% were first degree relatives.

Worldwide, acute infections, especially pneumonia and urinary tract infections, constitute the most common precipitating factor for DKA (13). In Addis Ababa, Ethiopia, Desta (14) reported that the most common precipitating factors for children with DKA were infections (52%), omission of insulin (16%) and parasitic infestation (12%). Jayashree and Singhi (15), in North India stated that precipitating factors for DKA among children were sepsis (37%), omitting insulin (15%) or both sepsis with insulin omission (7%). In Jeddah, Saudi Arabia, Qari (16) showed that poor compliance e.g., omitting insulin injections, was the most common precipitating factor for DKA (54.4%), followed by infections (28%). In Al-Baha, Saudi Arabia, Satti et al. (1) found that the commonest precipitating factor was infections (82.1%).

The primary fatal complication of DKA is cerebral edema. Moreover, vascular, musculoskeletal, pulmonary, gastrointestinal, and cognitive complications of DKA may rarely occur, but can result in acute and long-term morbidity (17).

DKA case fatality rates in developed countries range from 0.15% to 0.31%. In developing countries, it is higher (13%), where infections continue as one of the most important precipitating factors for DKA (15,18).

The clinical presentation of DKA usually develops rapidly, over a period of less than 24 hours. Several days before development of DKA, several symptoms may develop, i.e., polyuria, polydipsia, and weight loss. Vomiting and abdominal pain are frequently the presenting symptoms (19). The assessment of ketonemia is usually performed by the nitroprusside reaction. Direct measurement of β-hydroxybutyrate is currently available by finger stick method, which is a more accurate indicator of DKA (19).

The prevention of DKA can be successfully done by better access to medical care, proper health education, and effective communication with a health care provider during an intercurrent illness. Involvement of family members should be encouraged. They need to be educated on insulin regimen and how to perform measurements of blood glucose. Also, a written care plan should be provided to the patient and/or caregiver, as this enhances understanding and emphasizes the importance of self-management of diabetes (20).

Advances in technology have provided more efficient means of monitoring diabetes and maintaining glycemic control in an outpatient setting. The use of real-time continuous glucose monitoring in patients with T1DM has been shown to significantly lower hemoglobin A1c. Real-time continuous glucose monitoring also has the advantage of signaling to patients the early detection of glucose abnormalities, allowing for prompt intervention (21). At-home use of ketone meters that detect blood β-hydroxybutyrate has also been shown to aid in early detection and management of ketosis, which may decrease the need for specialized care. Short-acting insulin can be administered with fluids early on to prevent DKA (22). Atkilt et al. (23) reported that the odds of developing DKA in newly diagnosed T1D children was 49% lower for children whose parents knew its sign and symptoms than parents' who didn't know. They explained their finding by that parents who know its sign and symptoms seek health care before their children develop DKA. Thus, this study aimed to assess knowledge of parents of T1DM children about DKA.

Methodology

This cross-sectional study was conducted among parents of children with T1DM registered at the Diabetes Center, Abha. A total of 385 parents of type 1 diabetic children were interviewed. Based on relevant literature, a study questionnaire was designed in simple Arabic Language by the researcher. It included the following two parts:

- Personal data: Parents' age, gender, education, nationality, employment, being diabetic, and child's age, gender, duration of diabetes, previous hospitalization and having diabetic siblings.
- Knowledge about DKA and prevention of diabetes: Fourteen items including 40 statements.

The study questionnaire validity (face and content) was assessed by three consultants of Family Medicine.

A correct response was assigned a score of (1) and an incorrect response was assigned a score of (0). Therefore, for the 40 knowledge statements, parents' total knowledge score ranged from 0 to 40. Parents who attained total scores less than 20 (i.e., <50%) were considered to have "poor" knowledge, those who attained a score of 30 or more were considered to have "good" knowledge, while those who attained a score of 20-29 were considered to have "fair" knowledge.

A pilot was conducted on 20 parents of T1DM children. The objectives of the pilot study were to test the clarity and wording of the study questionnaire. Data collected within the pilot study were excluded from the main study.

During the period from December 2018 till February 2019, the researcher visited the Diabetes Center in Abha City on a daily basis. All potential participant parents of T1DM children attending the Diabetes Center were briefed regarding the objectives of the study and then were invited to participate in the current study. The study questionnaire was distributed to each participant and was then collected after being filled. The researcher repeated the daily visits till the required sample size was fulfilled.

Collected data were verified prior to computerized data entry. The Statistical Package for Social Sciences (SPSS version 23) was utilized for that purpose. Descriptive statistics were applied (e.g., frequency, percentage, mean and standard deviation). Tests of significance were applied (e.g. X^2-test). P-values less than 0.05 were considered as statistically significant.

All necessary official approvals were secured by the researcher prior to data collection. The researcher clearly informed all potential participants (and their caregivers) about the subject and objectives of the study. Then she explained to them the study questionnaire. Collected data were kept confidential and the researcher provided the necessary health education to all participants to prevent the incidence or recurrence of DKA.

Results

Table 1 shows that 49.6% of interviewed parents were mothers of type 1 diabetic children, while 50.4% were fathers. More than half of parents (56.4%) were aged 30-40 years, while 12.7% were aged less than 30 years, and 30.9% were aged more than 40 years. Only 18.7% of parents were diabetic. More than half of parents (58.2%) were university educated, while 1.8% were illiterate, 7.8% had primary education, 10.1% had intermediate education and 22.1% had secondary education. The occupation of 66.2% of parents was unrelated to the healthcare field, while that of 11.2% was related to the healthcare field and 22.6% were unemployed. The majority of parents (96.6%) were Saudi. The monthly income of 17.7% of parents was less than 5000 SR, while that of 41.8% was 5000-10000 SR and that of 40.5% was more than 10000 SR.

Table 2 shows that 54% of type 1 diabetic children were males. Almost half of children were aged above 10 years (50.9%). The duration of diabetes was <4 years among 59% of children. About two thirds of diabetic children (65.7%) were previously hospitalized for complications of diabetes. More than two-thirds of those who were hospitalized (67.1%) were hospitalized several times, while 32.9% were hospitalized only once. About one quarter of diabetic children (23.1%) had diabetic siblings.

Table 3 shows that only 40.8% of parents correctly stated normal range for fasting blood sugar, while 15.1% correctly stated the normal range for postprandial blood sugar and 31.9% correctly stated the normal range for glycosylated hemoglobin. Regarding seeking medical advice, 37.4% correctly stated that diabetic children should go to the doctor when having repeated vomiting, 53.5% correctly stated that he/she should go to the doctor when having high uncontrolled blood sugar, while only 9.1% correctly stated that diabetic children should go to the doctor when having ketonuria. Regarding causes of ketoacidosis, 43.9% of parents correctly denied high insulin dose, hypoglycemia (49.1%) but due to low insulin dose (46.2%) or low food intake (35.6%), while 46.2% correctly stated low insulin dose or severe infections (34.8%). Regarding symptoms and signs of ketoacidosis, parents correctly stated polyuria (78.4%), severe thirst (77.7%), abdominal colic (65.2%), repeated vomiting (64.2%), loss of weight (55.6%), acetone odor of breath (52.7%), cold skin (43.4%), disturbed consciousness (40.3%) and muscle weakness (61.8%). About three quarters of parents (75.1%) correctly stated that ketoacidosis among children is a dangerous condition, while 91.2% correctly stated that the hospital is the place for its management. Regarding laboratory investigations for ketoacidosis, 70.6% of parents correctly stated assessment of blood glucose level, 28.8% stated assessment of serum potassium level, while 60.3% stated assessment of ketonuria.

Regarding management of ketoacidosis, 86.8% of parents correctly stated hospitalization, 55.1% stated insulin administration, while 53% stated intravenous fluids administration. Regarding prevention of ketoacidosis,

83.9% of parents correctly stated administration of the proper dose of insulin, and 82.3% stated blood sugar monitoring. Regarding complications of ketoacidosis, 68.1% correctly stated severe dehydration, 63.6% stated coma, while 22.6% stated brain edema. Regarding prevention of type 1 diabetes complications, 92.7% of parents stated intake of healthy foods, exercise and proper treatment of diabetes, 92.2% stated daily blood sugar monitoring, 82.3% stated proper insulin dose administration, 81% stated assessment of ketones in urine, 79% stated going to the emergency department in case of uncontrolled hyperglycemia or ketonuria (77.1%).

Figure 1 shows that 29.6% of parents had good knowledge regarding diabetic ketoacidosis, while 32.5% had fair grade and 37.9% had a poor grade of knowledge.

Table 4 shows that parents' good knowledge grade was significantly less among fathers than mothers of type 1 diabetic children (25.3% and 34% respectively, $p<0.001$). Parents aged >40 years had significantly less good knowledge grade than younger parents aged 30-40 years or <30 years (22.7%, 30% and 44.9%, respectively, $p=0.018$). Diabetic parents had less good knowledge grade than non-diabetic ones (19.4% and 31.9%, respectively). However, the difference was not statistically significant. Less than university educated parents had significantly less good knowledge grade than those university educated ($p=0.035$). Unemployed parents and those whose occupation was not healthcare related had a significantly less good knowledge grade than those whose occupation is healthcare related ($p<0.001$). Non-Saudi parents had a lower good knowledge grade than Saudi parents (15.4%, and 30.1% respectively). However, the difference was not statistically significant. Parents with monthly income <5000 SR had significantly less good knowledge grade than those with higher monthly income ($p=0.021$).

Table 5 shows that parents of female type 1 diabetic children had less good knowledge grade than those of male children (27.7% and 31.3%, respectively). However, the difference was not statistically significant. Parents of younger type 1 diabetic children (<10 years) had less good knowledge grade than those of older children (28.5% and 30.6%, respectively). However, the difference was not statistically significant. Parents of type 1 diabetic children whose duration was four years or less had less good knowledge grade than parents whose children had a longer disease duration (28.2% and 31.6%, respectively). However, the difference was not statistically significant. Parents of children who were not hospitalized for complications of their diabetes had less good knowledge than those whose children were hospitalized (25% and 32%, respectively). However, the difference was not statistically significant. Parents of children who were hospitalized once had significantly less good knowledge grade than parents of children who were hospitalized several times (26.9% and 34.3%, respectively). However, the difference was not statistically significant. Parents of diabetic children who did not have other diabetic children had significantly less good knowledge grade than those who had other diabetic children (27% and 38.2%, respectively, $p<0.001$).

Table 1: Personal characteristics of interviewed parents of type 1 diabetic children

Personal characteristics of parents	No.	%
Interviewed parent		
• Mother	191	49.6
• Father	194	50.4
Age groups of parents		
• <30 years	49	12.7
• 30-40 years	217	56.4
• >40 years	119	30.9
Diabetic parent		
• No	313	81.3
• Yes	72	18.7
Parent's education		
• Illiterate	7	1.8
• Primary	30	7.8
• Intermediate	39	10.1
• Secondary	85	22.1
• University	224	58.2
Parent's occupation		
• Related to the healthcare field	43	11.2
• Unrelated to healthcare field	255	66.2
• Unemployed	87	22.6
Nationality		
• Saudi	372	96.6
• Non-Saudi	13	3.4
Monthly income		
• <5000 SR	68	17.7
• 5000-10000 SR	161	41.8
• >10000 SR	156	40.5

Table 2: Characteristics of type 1 diabetic children

Characteristics	No.	%
Gender		
• Male	208	54.0
• Female	177	46.0
Age groups		
• ≤10 years	189	49.1
• >10 years	196	50.9
Duration of diabetes		
• ≤4 years	227	59.0
• >4 years	158	41.0
Hospitalization for diabetes complications:	253	65.7
• Once	57	32.9
• Several times	111	67.1
Diabetic siblings	89	23.1

Table 3: Frequency and percentage of parents' correct responses regarding their knowledge about diabetes and diabetic ketoacidosis

Knowledge items	No.	%
Normal range for fasting blood sugar	157	40.8
Normal range for post-prandial blood sugar	58	15.1
Normal range for HbA1c	123	31.9
The diabetic child should go to the doctor if he/she:		
• Has repeated vomiting	144	37.4
• Has high uncontrolled blood sugar	206	53.5
• Has ketonuria	35	9.1
Causes of ketoacidosis		
• High insulin dose	169	43.9
• Hypoglycemia	189	49.1
• Low food intake	137	35.6
• Low insulin dose	178	46.2
• Severe infections	134	34.8
Symptoms and signs of ketoacidosis		
• Polyuria	302	78.4
• Severe thirst	299	77.7
• Abdominal colic	251	65.2
• Repeated vomiting	247	64.2
• Loss of weight	214	55.6
• Acetone-odor of breath	203	52.7
• Cold skin	167	43.4
• Disturbed consciousness	155	40.3
• Muscle weakness	238	61.8
Ketoacidosis among children is dangerous	289	75.1
The hospital is the place for management of ketoacidosis	351	91.2
Lab investigations for ketoacidosis		
• Assessment of blood glucose level	272	70.6
• Assessment of serum potassium level	111	28.8
• Assessment of ketonuria	232	60.3
Steps for management of ketoacidosis		
• Hospitalization	334	86.8
• Insulin administration	212	55.1
• Intravenous fluids	204	53.0
How to prevent ketoacidosis?		
• Administering the proper dose of insulin	323	83.9
• Blood sugar monitoring	317	82.3
Complications of ketoacidosis		
• Severe dehydration	262	68.1
• Coma	245	63.6
• Brain edema	87	22.6
How to avoid complications of type 1 diabetes?		
• Healthy food, exercise and proper treatment	357	92.7
• Daily blood sugar monitoring	355	92.2
• Proper insulin dose administration	317	82.3
• Assessment of ketones in urine	312	81.0
• Going to the ED in case of uncontrolled hyperglycemia	304	79.0
• Going to the ED in case of ketonuria	297	77.1

Table 4: Parents' knowledge grades according to their personal characteristics

Personal characteristics of parents	Poor		Fair		Good		P Value
	No.	%	No.	%	No.	%	
Interviewed parent							
Mother	44	23.0	82	42.9	65	34.0	
Father	102	52.6	43	22.2	49	25.3	<0.001
Age groups of parents							
<30 years	18	36.7	9	18.4	22	44.9	
30-40 years	85	39.2	67	30.9	65	30.0	
>40 years	43	36.1	49	41.2	27	22.7	0.018
Diabetic parent							
No	118	37.7	95	30.4	100	31.9	
Yes	28	38.9	30	41.7	14	19.4	0.066
Parent's education							
Illiterate	3	42.9	4	57.1	0	0.0	
Primary	11	36.7	13	43.3	6	20.0	
Intermediate	15	38.5	19	48.7	5	12.8	
Secondary	35	41.2	26	30.6	24	28.2	
University	82	36.6	63	28.1	79	35.3	0.035
Parent's occupation							
Related to healthcare field	3	7.0	12	27.9	28	65.1	
Unrelated healthcare field	115	45.1	77	30.2	63	24.7	
Unemployed	28	32.2	36	41.4	23	26.4	<0.001
Nationality							
Saudi	143	38.4	117	31.5	112	30.1	
Non-Saudi	3	23.1	8	61.5	2	15.4	0.074
Monthly income							
<5000 SR	34	50.0	25	36.8	9	13.2	
5000-10000 SR	59	36.6	51	31.7	51	31.7	
>10000 SR	53	34.0	49	31.4	54	34.6	0.021

Table 5: Parents' knowledge grades according to their diabetic children's characteristics

Personal characteristics of children	Poor		Fair		Good		P Value
	No.	%	No.	%	No.	%	
Gender							
• Male	82	39.4	61	29.3	65	31.3	
• Female	64	36.2	64	36.2	49	27.7	0.358
Age groups							
• ≤10 years	68	36.0	67	35.4	54	28.5	
• >10 years	78	39.8	58	29.6	60	30.6	0.467
Duration of diabetes							
• ≤4 years	94	41.4	69	30.4	64	28.2	
• >4 years	52	32.9	56	35.4	50	31.6	0.237
Hospitalization for diabetes complications							
• No	56	42.4	43	32.6	33	25.0	
• Yes	90	35.6	82	32.4	81	32.0	0.284
Frequency of hospitalization							
• Once	36	46.2	21	26.9	21	26.9	
• Several times	54	30.9	61	34.9	60	34.3	0.064
Diabetic siblings							
• No	129	43.6	87	29.4	80	27.0	
• Yes	17	19.1	38	42.7	34	38.2	<0.001

Discussion

Findings of the present study indicated that almost two thirds of diabetic children were previously hospitalized for complications of diabetes, mostly several times.

This finding is in accordance with that reported by Al-Hayek et al. (24), in Saudi Arabia, who found that all their adolescent type 1 diabetic patients had experienced diabetic ketoacidosis, while only 54.4% experienced one episode, 39.8% had two episodes and 5.8% had three episodes of ketoacidosis or more. In Nigeria, Onyiriuka et al. (25) reported that about three-quarters of type 1 diabetics had presented with diabetic ketoacidosis. However, lower rates were reported by Jefferies et al. (26) in New Zealand, which found that that one-quarter of type 1 diabetic children presented with diabetic ketoacidosis at their first diagnosis, while in New-Zealand, Szypowska et al. (27) found that one-quarter of type 1 diabetic children presented with DKA at their first diagnosis.

Zhong et al. (28) noted that recurrent diabetic ketoacidosis accounted for a significant portion of the hospitalizations, mainly for type 1 diabetes. Jefferies et al. (26) stated that, worldwide, 12.8–80% of type 1 diabetic patients present with diabetic ketoacidosis as their initial presentation of diabetes.

In North America, Cengiz et al. (29) reported an exponential rise of hospital admissions for ketoacidosis with increasing HbA1c among type 1 diabetic patients. Poor metabolic control was the strongest predictor of hospital admission for DKA in the study of Karges et al. (30).

Wolfsdorf et al. (31) stressed that treatment of diabetic ketoacidosis in children frequently requires hospitalization since experienced nursing staff and specialized pediatricians are highly needed.

Fazeli Farsani et al. (32) reported that worldwide incidence of ketoacidosis among type 1 diabetics ranges from 8 to 51.3 cases/1000 patient-years. However, Li et al. (33) in China, reported a higher incidence rate (i.e., 263/1,000 patient-years). This high rate has been explained by differences in national health care systems, with limited access to routine health care for type 1 diabetics and the infrequent self-monitoring of blood glucose (32).

Several epidemiological studies have reported that hospitalizations for diabetic ketoacidosis have recently increased worldwide (34). Vellanki and Umpierrez (35) explained this increased incidence of hospitalization among type 1 diabetics by the increased admissions for mild diabetic ketoacidosis.

The present study revealed that 18.7% of type 1 diabetic children's parents and 23.1% of siblings were diabetic. Moreover, more than half of type 1 diabetic children were males.

This finding reflects the strong family history among type 1 diabetes children. Parkkola et al. (36) reported that 12.2% of the children with newly diagnosed type 1 diabetes had at least one affected first-degree relative. Sipetić et al. (37) reported that risk of type 1 diabetes is significantly associated with a positive family history for type 1 diabetes.

Gale and Gillespie (38) stated that generally, populations of type 1 diabetes show a male excess, with an approximate 3:2 male:female ratio. Moreover, fathers with type 1 diabetes are more likely than affected mothers to transmit the condition to their offspring.

The present study showed that participant parents of type 1 diabetic children had suboptimal knowledge regarding diabetes and diabetic ketoacidosis. More than one-third of parents had poor knowledge, while only 29.6% had good knowledge. Their main knowledge deficits were related to normal range of fasting and post-prandial blood sugar, normal range for HbA1c, when the diabetic child should see a doctor and causes of diabetic ketoacidosis.

Similarly, in East England, Usher-Smith et al. (39) reported that half the parents of children with type 1 diabetes did not have knowledge about symptoms of diabetes prior to their child being diagnosed. It was clear that this lack of knowledge did not prompt earlier help-seeking and diagnosis. Moreover, even among knowledgeable parents, symptoms and presentation of diabetes differed from what they expected. This mismatch with their prior beliefs also appeared to delay help-seeking.

Pulungan et al. (40) stressed that lack of parental knowledge on type 1 diabetes treatment plays a major role in non-compliance, causing insulin omission or failure to routinely visit the physician for insulin adjustment.

It has been observed that diabetic ketoacidosis is decreasing in several European countries, e.g., Sweden (41) and Finland (42). This decrease was coincident with national health education programs, which aimed at increasing knowledge and awareness about diabetic ketoacidosis (9). Moreover, The Environmental Determinants of Diabetes in the Young (TEDDY) study reported a lower incidence of diabetic ketoacidosis at diagnosis when parents were made aware of the high risk of diabetes in their children (43).

Rosenbauer et al. (44) reported significant improvement in metabolic control and a simultaneous decrease in hypoglycemic events among type 1 diabetic children and adolescents. They explained that this improvement was achieved not only through the application of modern therapy methods, but also through improved education methods for the patients and their families.

Araszkiewicz et al. (45) stated that improved knowledge about diabetes and its complications is the foundation for better metabolic control among type 1 diabetic patients and is associated with decreased risk of complications.

Vanelli et al. (46) stated that raising awareness and improving knowledge through dissemination of information about diabetes mellitus could significantly reduce prevalence of diabetic ketoacidosis in type 1 diabetes mellitus. They emphasized that knowledge is one of the main factors in preventing diabetic ketoacidosis.

Therefore, Zhong et al. (28) emphasized the urgent need for health education programs to prevent diabetic ketoacidosis at new onset of diabetes and recurrent episodes of diabetic ketoacidosis. Strategies such as early screening, close follow-up of high-risk children, and education of parents and communities have been successful in prevention of diabetic ketoacidosis at onset of diabetes.

It is to be noted that the suboptimal knowledge level of parents of type 1 diabetic children in the present study possibly reflects deficient provision of health education to those parents.

Umpierrez and Kitabchi (13) reported that frequency of hospitalizations for diabetic ketoacidosis could be reduced after the implementation of diabetes education programs. Similarly, Szypowska et al. (27) emphasized that health education of patients and their guardians is essential and is considered as an effective method to decrease diabetic ketoacidosis episodes. Consequently, every consultation at a health care facility should be used ideally so that diabetic patients can get the maximum benefits from the health care providers. Moreover, information related to diabetes and diabetic ketoacidosis must be repeated at every visit.

Stefanowicz et al. (47) also stressed that health education programs for diabetic patients should be implemented as a constant, fundamental and essential component for management of diabetes during all patients' follow-up visits. It must be properly achieved in a structured manner based on a general outline that should include education at the onset of treatment and then repeated based upon an annual assessment of patients' training needs or upon their own request. The main objective of health education is to provide support toward independent management of diabetes and lifestyle modification associated with the recommended healthy diet and the appropriate physical activity.

Vellanki et al. (35) stated that prevention programs aiming at education of parents, pediatricians, and personnel at primary and secondary schools to recognize symptoms of diabetic ketoacidosis resulted in a significant decrease in the number of children presenting with diabetic ketoacidosis at initial diagnosis of diabetes.

The present study revealed that some characteristics were significantly associated with lower parents' knowledge regarding diabetes and diabetic ketoacidosis, e.g., fathers, older parents (aged >40 years), less than university educated parents, unemployed parents and those whose occupation was not healthcare-related, parents with monthly income <5000 SR had significantly less good knowledge grade than those with higher monthly income. These findings are in accordance with those reported by some other studies. Kim et al. (48) argued that, generally, knowledge of the population regarding diabetes mellitus has a positive association with their level of attained education. Rani et al. (49) reported that older age, higher socioeconomic class, and higher educational levels were associated with better knowledge among the population of rural India regarding diabetes mellitus.

In Brazil, dos Santos et al. (50) found that the frequency of correct answers tended to be higher amongst women compared to men, with statistically significant differences according to types of diabetes, symptoms of hyperglycemia, and normal blood glucose levels. Poor knowledge was related to symptoms of hyperglycemia, normal blood glucose levels, beneficial effects of physical activity on glycemia, and the increased risk of heart disease among diabetic patients.

In conclusion, most type 1 diabetic children are very frequently hospitalized for complications of diabetes, mostly more than once. Knowledge of more than one-third of parents of diabetic children about diabetic ketoacidosis is poor. Their main knowledge deficits were related to normal range of fasting and post-prandial blood sugar, normal range for HbA1c, when the diabetic child should see a doctor and causes of diabetic ketoacidosis. Some characteristics are significantly associated with lower knowledge regarding diabetes and diabetic ketoacidosis, i.e., being a father of a diabetic child, older parents, being less educated or unemployed parents, those whose occupation is not healthcare-related, having a monthly income <5000 SR, and having diabetic siblings.

Therefore, it can be recommended that health education to type 1 diabetic patients and their guardians should be fulfilled. It must be properly achieved in a structured manner based on a general outline that should include education at the onset of treatment and then repeated based upon an annual assessment of patients' training needs or upon their own request. During each consultation visit, health care providers should repeatedly offer information related to independent management of diabetes and diabetic ketoacidosis and how to identify symptoms of diabetic ketoacidosis. Areas of poor knowledge related to diabetes and diabetic ketoacidosis should be emphasized during health education sessions.

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Attitude, Practice and Knowledge of Undergraduate Medical Students Towards Musculoskeletal Effects of Smoking in Saudi Arabia

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Abstract

Background: Smoking is a chief cause of inevitable death and disability. It is considered a risk factor for prospect fracture by decreasing bone density and has deleterious consequences on bone quality.

Objectives: The aims of this study were to determine the prevalence of tobacco smoking and assess the awareness of musculoskeletal effects of smoking among undergraduate medical and health science students at Makkah region, Kingdom of Saudi Arabia (KSA).

Method: A cross-sectional study was performed, using a questionnaire on a randomly selected number ofstudents at Makkah region medical colleges in KSA. Data analysis was performed by a statistical team using SPSS program (version 16). The means and standard deviations of normally distributed variables were compared using paired t tests and for categorical variables, the X2 test was used. The p-value of less than 0.05 was considered to be statistically significant.

Results: We had 370 participants, 56.6% female, and 31.3% male. Smoking prevalence among medical students reached 71.1% smokers, 39.3% smokers for more than 4 years while 60.7% smoked for less than 4 years and 28.9% did not smoke. 64.1% of medical students believe that smoking will affect bone health, while 13.2% did not believe and 22.7% did not know that there is any relationship.

Conclusion: This study identified that prevalence of smoking among undergraduate medical students at Makkah region is higher than previous reports in KSA. There is a crucial need to endorse multi-disciplinary health education events at different age groups to prevent adolescent students smoking, and to support smoking cessation programs.

Key words: Smoking, cigarette, bone health, fracture, medical students, Saudi Arabia

Introduction

Smoking has been recognized as the greatest significant reason of preventable disease and early mortality [1]. Though various adverse health effects of smoking happen later in the lifespan, smoking leads to complications in adolescent people as well [2]. Every day, roughly 4,800 adolescents smoke their first cigarette; of these, approximately 2000 will changed to smokers [3]. Smoking-related diseases are attributed to smoking period (smoking years) and frequency (cigarettes/day). Furthermore, adult smokers started to smoke or had previously become habituated before 18 years of age [4]. Although many teenagers want to quit smoking, only a small number of them do [5]. Certainly, there has been an intense rise over the past decade in the total of college-age smokers [6]. Numerous researchers have stated that the prevalence of smoking rises from the fundamental to clinical years amongst medical college students, emphasizing the significance of directing anti-smoking activities to the fundamental years [7, 8]. For example, students who enter college as non-smokers are 40% less likely to start smoking if they live in a smoke-free campus [9]. With regard to Arab nations in particular, the World Health Organization has stated broadly distinctive prevalence rates of smoking amongst adolescent people: 18% in Kuwait, 43% in Yemen, 23% in Iraq, 25% in Kingdom of Saudi Arabia (KSA) and Jordan, 7% in Oman, 31% in Syrian Arab Republic and 53% in Lebanon [10]. Nevertheless, the pattern of smoking as well as the cessation rate, particularly amongst college students, is fundamentally unknown in many of these countries, including KSA. One study calculates the prevalence of active smoking amongst male medical students at King Saud University to be roughly 13% [11]. In 2009, Al-Turki et al discovered that the prevalence of smoking ranges from 2.4-52.3% among medical students in Central Saudi Arabia [11]. It is highlighted that nicotine has crucial side effects that may disturb most body systems, forexample, the cardiovascular system, reproductive system, respiratory system, urinary system and also the musculoskeletal system [12]. Some of the side effects that can be caused by nicotine and carbon monoxide are decreasing the tissue oxygenation as well as micro-perfusion, and on the other hand, they also raise the rate of polycythemia and platelet aggregation [13]. Furthermore, the blood viscosity will increase while the total of oxyhemoglobin will be reduced due to carbon monoxide [13]. As a result, nicotine can affect the musculoskeletal system, predominantly bone healing. In 2016, Pearson, Clement, Edwards and Scammell showed that the risk of delayed or nonunion bone healing is 2.2 times greater in smokers. They explored that bone union time would took nearly 27.7 days longer in smokers than non-smokers [14]. Referring to clinical trials and demographic research which has been done throughout the countries, it disclosed that individuals who smoke have poor prognosis for fracture healing [15]. Furthermore, the negative impact of smoking on the bones is that it disturbs mineral density, lumbar disc degeneration and rate of hip fractures [15]. Smoking can lead to osteoporosis, spine and joint arthritis, devastate the cartilages and raise the risk of surgical infection [16].

There are a couple of research studies which been made about the consequence of smoking on the musculoskeletal system, and bone healing process, in Saudi Arabia [16]. Fractures are a chief communal health concern, with estimates of over 3 million fractures yearly at a financial cost of $25.3 billion by the year 2025 in the USA only [17]. Hip fractures provide unreasonable burden on healthcare budgets and accompanying that it is not only an important disease but also causes an increased death rate. Research has revealed that smoking is related to an increase in fracturerisk, predominantly at the hip, and existing smoking status is part of the World Health Organization Fracture Risk Assessment Tool (FRAX®) [18]. There are statistics from four big meta-analyses evaluating fracture risk in smokers. In their analysis, Law and Hackshaw [19] also anticipated hip fracture risk from 19 cohort and case-control studies with a sample size of 133,434 with 3,889 fractures. They found a significantly increased risk of hip fracture in female smokers, with increasing risk as persons aged. Lorentzon et al. studied 1,068 young men (average age 19 years) including 93 active smokers. Smokers had lower areal Bone Mineral Density (BMD) at the spine and hip than nonsmokers. After modification for age, height, weight, calcium intake, and physical activity, smokers had lower cortical bone size at the tibia and thinner cortices at mutually the radius and tibia than nonsmokers. [20] In addition, smokers had lower trabecular volumetric BMD at the tibia but no difference in cortical volumetric BMD.

The objectives of the current study were to determine the prevalence of tobacco smoking and to assess the awareness of musculoskeletal effects of smoking among undergraduate medical and health science students at Makkah region, Kingdom of Saudi Arabia (KSA).

Methods

Design: A descriptive/ analytic cross-sectional study was performed, using a questionnaire on a sample size of 370 male and female students who were randomly selected at Western region medical colleges of Saudi Arabia.

Analysis: Data analysis was performed by statistical team using SPSS program (version 16). The means and standard deviations of normally distributed variables were compared using paired t tests and for categorical variables, the X2 test was used. The p-value of less than 0.05 was considered to be a statistically significant.

Participants: Undergraduate medical students enrolled at Medical colleges in Makkah region who voluntarily responded to participate in the online survey.

Survey Instrument: After obtaining ethical approval from research ethic board committee at our institution, randomly selected consenting participants were asked to fill out a 25 items self-structured online questionnaire. It was first directed to 12 students of our college and pilot tested. Appropriate adjustments were then made before confirming it for the study. The questionnaire contained items to look for information regarding demography,

prevalence, and smoking pattern. Students were assured about the anonymity of their answers. Since knowledge of musculoskeletal effects of smoking evolves as we grow the survey included questions about respondents' sociodemographic, clinical information, education, history and pattern of smoking, and students' knowledge and beliefs of musculoskeletal effects of smoking, bone fractures, bone healing and physical activities. The questionnaire included primarily close-ended questions. Some of the questions allowed more than 1 answer. The questionnaire was settled after a comprehensive appraisal of the related articles and consultation amongst the research team. It was face-validated through discussion with professional collaborators in the field and was moreover objectively validated for comprehensibility.

Implications of results:
Results will be developed into educational awareness planning and interventions for incoming undergraduate students.

Results

Table 1: Prevalence of smoking in medical school

Do you smoke?	Medical school	Mean	N	Std. Deviation
Yes	ISNC	1.33	53	.474
	UQU	1.00	1	.
	KAU	1.55	20	.510
	Farabi	1.50	2	.707
	Taif	1.00	3	.000
	Fakeeh	1.50	2	.707
	BMC	1.40	5	.548
	KSAU-HS	1.50	4	.577
	Other	1.06	18	.236
	Total	1.33	108	.471
No	ISNC	1.74	102	.443
	UQU	1.53	15	.516
	KAU	1.86	59	.345
	Farabi	1.60	5	.548
	Taif	1.81	16	.403
	Fakeeh	1.00	1	.
	BMC	1.88	8	.354
	KSAU-HS	1.50	4	.577
	Other	1.44	52	.502
	Total	1.69	262	.461
Total	ISNC	1.60	154	.492
	UQU	1.50	16	.516
	KAU	1.78	79	.414
	Farabi	1.57	7	.535
	Taif	1.68	19	.478
	Fakeeh	1.33	3	.577
	BMC	1.69	13	.480
	KSAU-HS	1.50	8	.535
	Other	1.34	70	.478
	Total	1.59	369	.493

ISNC: Ibn Sina National College for Medical Studies, UQU: Umm Al-Qura University,
KAU: King Abdulaziz University, Farabi: Al-Farabi college, Taif: Taif university,
Fakeeh: Fakeeh College for Medical Sciences, BMC: Batterjee Medical College,
KSAU-NG: King Saud Bin Abdulaziz University for Health Science

Table 2: Knowledge of smoking effect on bone and general health

Have you ever experienced bone pain ?	Which bone had you fractured ?	Have you ever had bone fracture ?	Mean	N	Std. Deviation
Yes	Forearm	Yes	1.00	1	.
		No	1.00	1	.
		Total	1.25	8	.463
	Fingers	Yes	1.00	1	.
		No	1.48	67	.503
		Total	1.45	71	.501
	Total	Yes	1.00	2	.000
		No	1.47	69	.503
		Total	1.43	79	.498
No	Foot	non	1.63	290	.483
		Total	1.63	290	.483
	Total	non	1.63	290	.483
		Total	1.63	290	.483
Total	Forearm	Yes	1.00	1	.
		No	1.00	1	.
		Total	1.25	8	.463
	Fingers	Yes	1.00	1	.
		No	1.48	67	.503
		Total	1.45	71	.501
	Foot	non	1.63	290	.483
		Total	1.63	290	.483
	Total	Yes	1.00	2	.000
		No	1.47	68	.503
		non	1.63	290	.483
		Total	1.59	369	.493

Table 3: Relation of smoker to general exercising and health activity

Do you smoke?	Do you perform exercise/ physical activities ?	Mean	N	Std. Deviation
Yes	1-2 days	1.37	28	.492
	3-4 days	1.32	25	.476
	5-7 days	1.15	13	.376
	0	1.36	42	.485
	Total	1.33	108	.471
No	1-2 days	1.69	55	.466
	3-4 days	1.68	68	.471
	5-7 days	1.69	35	.471
	0	1.71	104	.455
	Total	1.69	262	.461

Summary of results

The prevalence of smoking in our sample was 71.1% and 28.9% are non-smoker. 39.3% of smokers had smoked for a period of more than 4 years while 60.7% smoked for less than 4 years.

Our results showed that a bulk of students who smoke represents 49.5% and they reported that they smoke cigarettes and 25.3% smoke shisha while 18.7% smoke Dokha (Arabian tobacco product, consisting of dried and finely shredded tobacco flakes mixed with herbs and spices). Nevertheless, 10.3% smoked more than 20 cigarettes per day, 41.1% of smokers smoked 5 cigarettes per day, while the rest, 48.6%, smoked 10 – 20 cigarettes per day.

We found that the majority, 39.3%, of smokers don't want to quit. On the other hand, we found that 36.4% plan to quit smoking, and 24.3% plan to quit after finishing medical school. There are numerous potential explanations for the extraordinary prevalence, including high pressure of medical specialty. Overall, smoking and physical activity seems to be negatively associated, but such simplifications must be made with caution as there may be many causes.

We found in our study that 60.5% perform exercise, 40.2% of them spend 30 minutes, 25% spend 60 minutes, 19.6% spend 10 minutes and 15.2% spend more than 60 minutes, while 39.5% don't exercise. On the other hand, 42% from those who performed exercise do physical activities 3-4 days a week as a part of their work and 36.6% do 1-2 days a week while 21.4% do it 5-7 days.

On other hand, 68.1% of students know that smoking increases post-surgical wound healing complications risk whereas 31.9% did not know that risk. The main bulk of undergraduate medical students 51.9% do not know that smoking destroys cartilage while 48.1% knew that fact. 54.6% of students know that smoking delays healing of tendons repair while 45.4% of students are not familiar with that fact.

Discussion

Our study offered insight about the prevalence and attitudes in respect to Musculoskeletal effects of smoking in Saudi Arabian medical students from different specialties in Jeddah, Saudi Arabia. The prevalence of smoking in our sample was 71.1% and 28.9% were non-smokers. 39.3% of smokers smoked for a period of more than 4 years while 60.7% smokers for less than 4 years. The prevalence is greater than the prevalence of 27.8% stated in 2014 amongst dental students at King Saud University, KSA [21]. In addition, that number is higher than the 24.8% prevalence amongst undergraduate medical students in the western region of KSA [22] and the 17.6% amongst undergraduate medical students at King Fahad Medical City in Riyadh, KSA [23]. This outcome is also greater than the results of an article conducted between students at a Malaysian college, which stated that the prevalence was 29% [24]. Moreover, our result is higher compared to a study of smoking amongst Jordan University medical students that revealed a total prevalence of 50.2% [25]. Our results showed that the bulk of students who smoke represents 49.5% and they reported that they smoked cigarettes and 25.3% smoked shisha while 18.7% smoked Dokha. Nevertheless, 10.3% smoked more than 20 cigarettes per day, 41.1% of smokers smoked 5 cigarettes per day, while the rest, 48.6%, smoked 10 – 20 cigarettes per day. This outcome varies from the results of the national analysis of the general public in the kingdom that revealed that commencement of smoking was more common at the age of 19 years [26]. At such an age, students are likely to be in university. We found that the majority (39.3%) of smokers don't want to quit. On the other hand, we found that 36.4% have a plan to quit smoking, and 24.3% have a plan to quit after finishing medical school. There are numerous potential explanations for the extraordinary prevalence, including high pressure of medical specialty. Overall, smoking and physical activity seems to be negatively associated, but such simplifications must be made with caution for many causes. Though a bulk of studies advocate a reverse relationship between physical activity and smoking, this relationship seemed to be more attenuated in youths, and multifaceted relations may occur for other people subgroups [27]. We found in our study that 60.5% perform exercise, 40.2% of them spend 30 minutes, 25% spend 60 minutes, 19.6% spend 10 minutes and 15.2% spend more than 60 minutes, while 39.5% do not perform exercise. On the other hand, 42% from those who performed exercise do physical activities 3-4 days a week as a part of their work and 36.6% do it 1-2 days while 21.4% do it 5-7 days. There are hypothetical primary and secondary special effects of smoking on musculoskeletal health and risk of fracture. Primary toxic consequences of smoking on bone may be associated with nicotine special effects [28, 29] or perhaps to toxic compounds in tobacco products like cadmium [30]. Smoking has direct special effects on osteogenesis involving change in the RANK–RANKL–OPG system [31,32], collagen metabolism [33], and bone angiogenesis [34]. Secondary special effects of smoking on bone might result from decreased calcium absorption from intestine [35], sex hormone dysregulation in production [36], cortical and gonadal hormones metabolism alterations [37–39], calciotropic hormones [40] like 25-hydroxy vitamin D [36, 41] plus parathyroid hormone [36]. These consequences may explain the commonly observed decrease in indications of bone formation, such as osteocalcin, among smokers [41, 42]. Smoking also has indirect influence on bone density and fractures risk through reductions in body weight. Body weight tends to be less for smokers than non-smoking individuals, and this weight differentiation may lead to lower bone density and increased fracture risk [43, 44]. Ultimately, smokers might be less physically active, which may decrease bone density [45] and increase risk of fracture [46]. Certain elements such as high BMI [47], and high calcium consumption [48] have been described to attenuate the smoking relationship with bone. Mosely and Finseth, found that smoking had a harmful effect on hand wounds healing. The adversarial effect of smoking

on fracture healing has been the base of much clinical research, and there is a strong relationship with cardiac and pulmonary diseases [49–54]. On other hand, 68.1% of students know that smoking increases post-surgical wound healing complications risk whereas 31.9% do not know that risk. The main bulk of undergraduate medical students 51.9% do not know that smoking destroys cartilage while 48.1% know that fact. 54.6% of students know that smoking delays healing of tendons repair while 45.4% do not. Research results have suggested that nicotine and related substances in cigarettes can also impair the regeneration of wound healing and soft tissues after fracture, thus decreasing the quality of postoperative consequences and delaying wound healing [55–57]. Our study shows that 59.5% of students know that smoking is a risk factor for osteoporosis while 50.5% do not know. 64.1% of students believe that smoking will affect bone health while 13.2% do not believe that and 22.7% do not know that there is a relationship. Regarding bone fractures, 78.6% did not experience bone fracture while 21.4% did and the commonest fracture was in the arm with 30.4%. There are over a million bone fractures each year in the United Kingdom, and 5–10% are stated not to heal adequately. Thus it is critical that the orthopedic surgeon is aware of the risk factors that could potentially impair bone healing, in order to avoid them whenever possible when managing fractures. There are several theories as to how smoking can influence the healing process of bone fractures and incorporate a reduced blood supply to the injury site, high levels of reactive oxygen species (ROSs) in circulation, low levels of vitamins and antioxidants and the attenuating consequence nicotine has on synthase of endothelial nitric oxide. Bone health is affected by cigarette smoke, and is well known to augment osteoporosis and osteonecrosis of femur in both genders. [58] Whatever the mechanism, this information suggests that the fractures risk is higher for smokers and those who have a smoking history than it is for individuals of the same demographic and BMD who don't or did not smoke ever in their life. Nevertheless, a big number of stronger independent fracture risk factors have been recognized in previous reports. These include fracture history, prolonged use of corticosteroids, significant family history of fracture, secondary osteoporosis, and perhaps the biochemical indicators of bone turnover. These risk factors can be readily used for measuring risk of fracture in the community and their relationships to smoking will need to be determined [59].

Limitations

The study was built on self-reported information hence elicit bias cannot be ruled out. Also, some undergraduate medical students may not disclose their smoking status, nevertheless they were told that their data would be kept confidential.

Conclusion

This study has shown that the prevalence of smoking among health sciences students at Makkah region is higher than the prevalence of smoking reported by other studies in KSA. As the number of smokers globally continues to increase, we must assume an increased disease burden attributable to smoking, including an increased number of osteoporotic fractures. There is a demand to encourage multi-disciplinary health education activities at different age groups to prevent young medical students from smoking, and to assist smoking cessation programs.

Recommendation

1. Campaigns should be developed to raise public awareness of the benefits of cessation and available therapeutic options, including addressing misconceptions about the safety and effectiveness of treatments.
2. Educate the students and provide their parents with the necessary knowledge to educate their children on the danger they face.
3. Focus on the application of the basic principles, the most important of which are:

a. Implementing and activating the smoking prevention law within public and public institutions and buildings, and allocating limited sections for smokers in restaurants and cafes.

b. Increase the health warning on smoking boxes to include at least one third of the box space and add the warning image.

4. Work to provide specialist smoking cessation services within free health centers.
5. Pay attention to the high prevalence of smoking Shisha and work on preventing its promotion, and in particular promote the claim that it is less harmful than cigarette.

Conflict of Interest

Authors have no conflict of interest.

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Study on the compliance of healthcare workers with the safety precautions in hospitals and health care facilities in the Kingdom of Saudi Arabia

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Abstract

Background: Prevention of Health Care Associated Infection (HCAI) is the responsibility of all individuals and services providing health care. Compliance with standard precautions reduces the risk of exposure to blood and body fluids. Many factors are responsible for non-adherence to the basic principles of universal precautions among health care providers.

Aim of the study: Assessment of the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Method: An observational cross-sectional study was performed on 400 healthcare workers in health care facilities in Saudi Arabia. The study was conducted between March and April 2019. The tool used in this study was a self-administered questionnaire divided into three sections: (1) socio demographic, (2) knowledge about concept of standard precautions, its measures and when used, (3) Practice of standard precautions.

Results: The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 female. They were taken from hospitals in two district areas; the age range was 20-40 years and life time work experience between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience. Most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept. Regarding the practice of hand hygiene, most of them always practiced hand hygiene.

Conclusion: More than half of our participants had sufficient knowledge and practice regarding standard precautions.

Key words: Compliance, Healthcare workers, Safety precautions.

Introduction

Standard precautions are a set of measures formulated to prevent transmission of blood borne pathogens when providing health care. Since identification of patients infected with these pathogens cannot be reliably made by medical history and physical examination, the Centers for Disease Control (CDC) has recommended that standard precautions are used on all patients, regardless of knowledge about their infection status [1].

Health care workers (HCWs) are at risk of various occupational hazards in the hospital, including exposure to blood borne infections such as HIV and hepatitis B and C virus from sharps injuries and contact with body fluids [2].

Developing countries, which account for the highest prevalence of HIV-infected patients in the world, also record the highest rate of needle-stick injuries [3].

The World Health Organization (WHO) estimates that about 2.5% of HIV cases and 40% of HBV and HCV cases among HCWs worldwide are the result of these exposures [4].

The risk of seroconversion following a needle-stick injury from an HCV-antigen positive patient is estimated to range from 1.2% to 10% [2].

The level of practice of standard precautions by health care workers differs from one health care worker to another. Their differences in knowledge, attitude and practices may be influenced by the type of their training. Various studies carried out among different categories of health care workers have found that exposure to blood or other body fluids were approximately 9.3%. A similar study conducted in Ibadan found a higher exposure rate of 25.1 %. Since there are very few studies done on these lines, we made an effort to test knowledge, attitude and practice by doing pre and post-test evaluation among various categories of health care personnel [5].

Compliance with standard precautions reduces the risk of exposure to blood and body fluids [6].

Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient means to prevent and control health care-associated infections in patients and health workers [7].

Standard precautions include hand washing; use of barriers (gloves, gown, cap and mask); care with devices, equipment and clothing used during care; environmental control (surface processing protocols and health service waste handling); adequate discarding of sharp instruments; and patient's accommodation in accordance to requirement levels such as an infection transmission source [2].

Hand hygiene is one of the most important elements of infection control activities. If properly implemented, hand hygiene alone can significantly reduce the risk of cross-transmission of infection in healthcare facilities [8].

Prevention of Health Care Associated Infection (HCAI) is the responsibility of all individuals and services providing health care [6].

Adoption of safe practices for handling needle sticks and other sharp objects, in view of the possibility of outbreaks, especially of Hepatitis B and C is also a preventive measure worthy of mentioning [2].

Many factors are responsible for non-adherence to the basic principles of universal precautions among health care providers [9].

From the available literature, the compliance with universal precautions among health workers in the Saudi Arabia has not been assessed.

Therefore, this study was conducted to assess the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Aim of the study: Assessment of the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Objectives: To evaluate knowledge of standard precautions among healthcare workers in hospitals in Saudi Arabia.

Patients and methods

This was an observational cross-sectional study, aimed to study knowledge and compliance of safety precautions among healthcare workers in health care facilities in Saudi Arabia.The study was conducted over a two month period between March and April 2019.

This study was undertaken in a governmental hospital, and private hospital and primary healthcare units in east and west Saudi Arabia. Both hospitals provide tertiary level of patient care covering major medical and surgical disciplines. The study population of 400 health workers included medical students (who had clinical training) (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20) of both hospitals, excluding those on annual or study leave at the time of the study.

Sample size was estimated using EPI INFO (Epidemiological Information Package) version (21) 3.5.3.statistical packages assuming that the frequency was (20%) at a confidence interval of 95 % and power of 80%. The Sample was conventional sample; selection of sample was done when sample size had been completed, and the application form closed.

Data collection:
Data was collected from study participants using a standardized self-administered questionnaire, applied in a Google form which had been loaded onto the internet after explaining the purpose of the study to those who could

be reached and obtaining consent for the questionnaire to be filled out anonymously. The responses of study participants were treated confidentially. The questionnaire was pre-tested on a random sample of 22 doctors, 8 medical students, 5 dentists and 5 pharmacists to ensure practicability and validity in questions and interpretation of responses. Following pre-testing, some questions and responses had to be revised for clarity or deleted as appropriate.

The self-administered questionnaire was divided into three sections
(1) Socio-demographic characteristics; Age, gender, occupational status, area of residency, work experience and place of training, expressed in six questions.
(2) Knowledge about concept of standard precautions, its measures and when used,. This was represented in ten questions.
(3) Practice of standard precautions especially hand washing, use of personal protective equipment such as gloves, face masks, oral care procedures and injection safety, included five questions.

Questions were developed from review of qualitative and quantitative literature for relevant items, [10,11] including guidelines on standard precautions provided by the World Health Organization (WHO, 2007), which included 21 items.

Scoring of the questionnaire:
Knowledge was measured by a set of 10 questions. Seven questions were given one point for answer yes and zero for answer no or I don't know. On the other hand, three questions were given one point for correct answer and 0 was given for an incorrect answer. Consequently, knowledge scores ranged from 0 to 18.

Practice was measured by a set of 5 questions using a three-point Likert's scale response for practice questions (i.e. Always, Not always, and rarely) where positive responses were expected, scores of 3, 2 and 1. Consequently, practice scores ranged from 5 to 15.

The knowledge score for each participant was expressed as a percentage from the total score. Sufficient knowledge was considered when the percentage of participant's knowledge score > 50%; while less than 50% was considered as insufficient knowledge. In addition, the practice score for each participant was expressed as a percentage from the total score. Sufficient practice was considered when the percentage of participant's practice score > 50%; while less than 50% was considered as insufficient practice.[12]

Data management:
The Collected data were recorded then presented and analyzed using SPSS (Statistical Package for the Social Sciences) version 22.0 and Epi info for windows version 3.5.3.

Data were represented in tables and graphs as frequencies and percentages.

Ethical considerations:
Ethical approval for the study was obtained from studied hospitals, ethical review committee and all study participants fulfilled consent for the study.

Constraints:
There were some constraints as we needed to increase the sample taken to avoid the not fully filled out questionnaires.

Results

The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 females. They were taken from hospitals in two district areas; the age range of respondents was 20-40 years and life time work experience varied between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience as shown in Table 1 & Figures1 & 2.

It was good to observe that most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept and said that it should be used in all situations not only in case of infections (Tables 2 &3).

Regarding level of awareness, it was good to find that most of the physicians and medical students had previous knowledge about standard precautions and more than 60% knew its concept. Other measurements of knowledge among physicians and medical students have been illustrated in Figure 3.

Regarding the practice of hand hygiene, 77.5%, 85.3%, 83% and 59.8% always practiced hand hygiene after touching patients, wearing protective masks, had personal protective equipment and bending the needles after usage, respectively (Table 4).

The knowledge score as well as the practice score for each participant was expressed as a percentage from the total score. More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

Table 1: Demographic characteristics among students in the study

Demographic Character		No	%
Gender	Male	125	31.3
	Female	275	68.8
	Total	**400**	**100.0**
Age	20-30	227	69.3
	30-40	123	30.8
	40-50	0	0
	>50	0	0
	Total	**400**	**100.0**
Occupational Status	Medical Student	73	18.3
	Doctors	272	68
	Dentist	35	8.8
	Pharmacist	20	5
	Total	**400**	**100.0**
Work experience	<5Y	141	35.25
	>5Y	186	46.5
	Still students	73	18.25
	Total	**400**	**100.0**
Place of training	Governmental hospital	91	22.8
	Private hospital	112	28
	Primary healthcare	197	49.3
	Total	**400**	**100.0**
Area of Residency	East	98	24.5
	West	302	75.5
	Total	**400**	**100.0**

Figure 1: Occupational Status among participants in the study

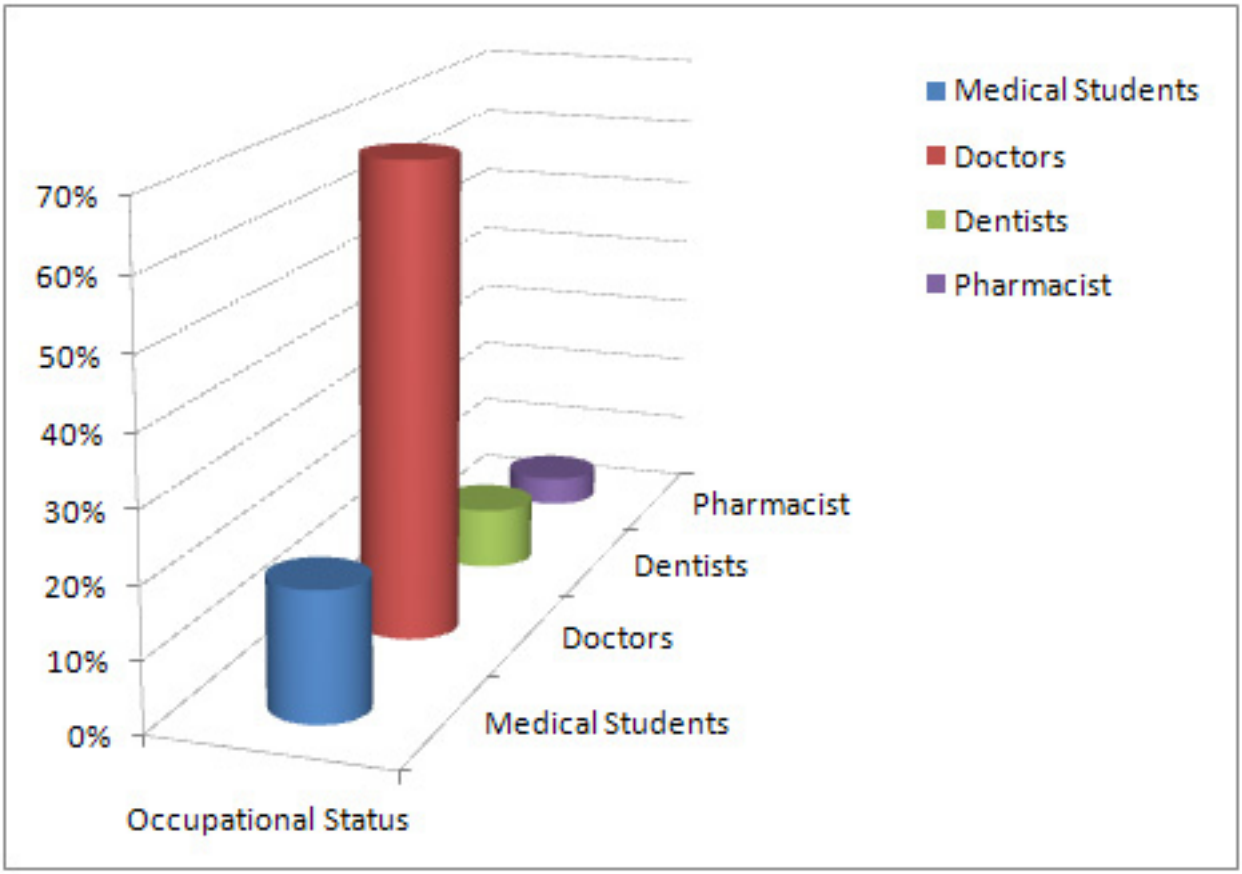

Figure 2: Place of training among participants in the study

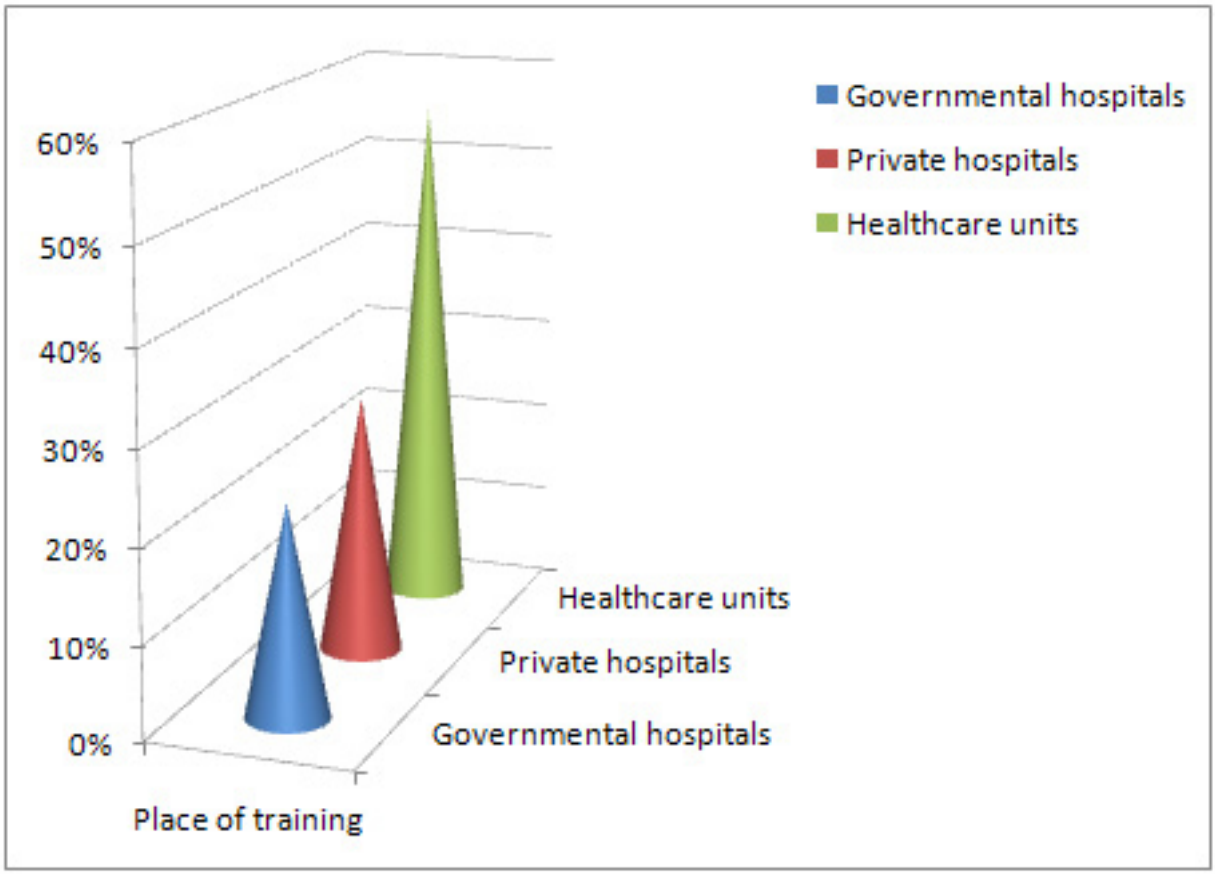

Figure 3: Physicians and medical students' knowledge about standard precautions

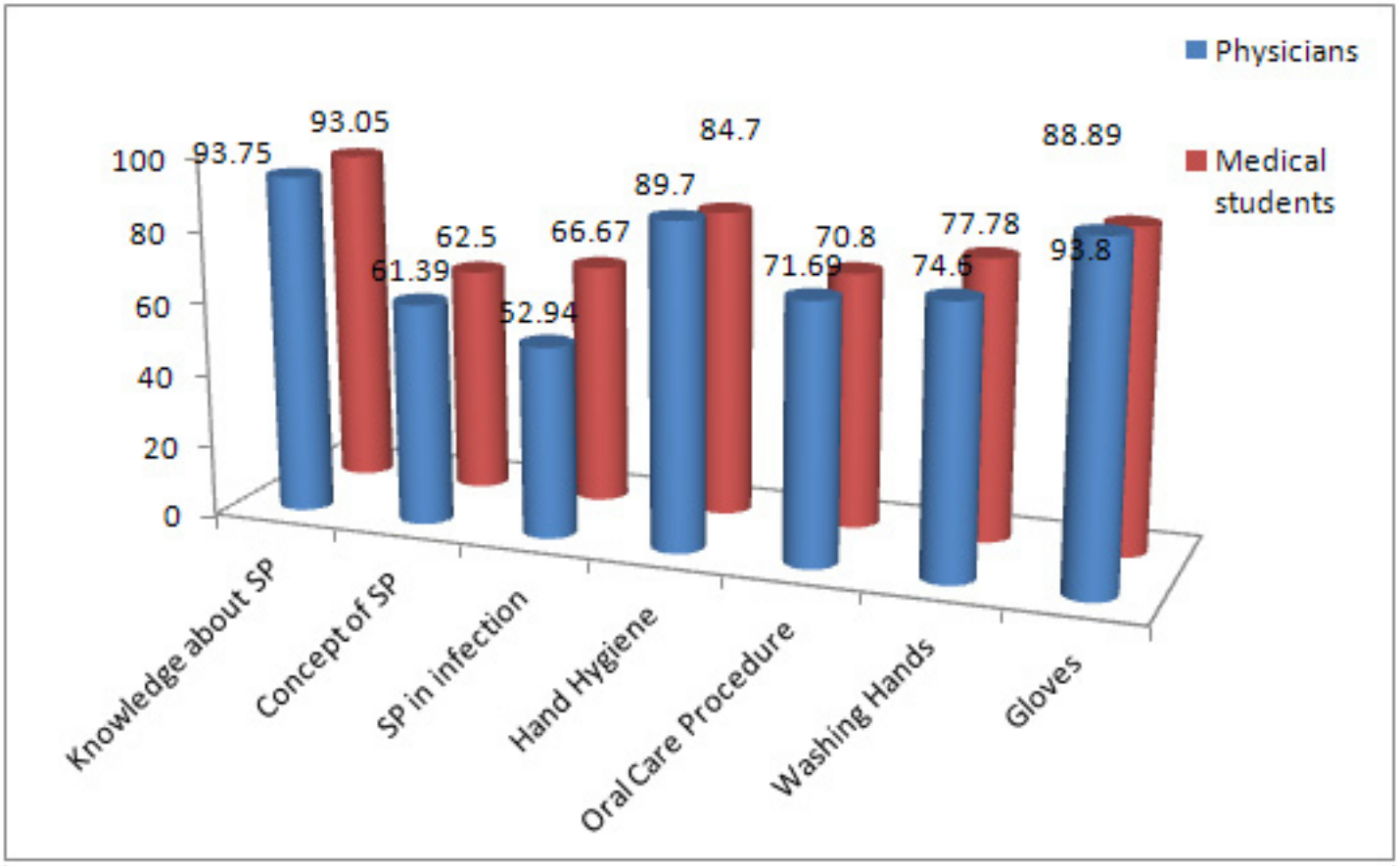

Table 2: Participants' knowledge about standard precautions

		No	%
Knowledge of Standard Precautions	Yes	319	79.75
	No	81	20.25
	Total	**400**	**100.0**
Knowledge of Concept SP	Yes	247	61.75
	No	153	38.25
	Total	**400**	**100.0**
SP not only used in infection	Yes	206	51.5
	No	124	31
	I don't know	70	17.5
	Total	**400**	**100.0**
Hand Hygiene for different patients	Yes	351	87.8
	No	24	6
	Not always	25	6.3
	Total	**400**	**100.0**
Using gloves during oral procedures	Yes	271	67.8
	No	89	22.3
	I don't know	39	9.8
	Total	**400**	**100.0**
Washing hands after removal of gloves	Yes	293	73.3
	No	80	20
	I don't know	26	6.5
	Total	**400**	**100.0**
Gloves should be changed	Yes	366	91.5
	No	15	3.8
	I don't know	19	4.8
	Total	**400**	**100.0**

Table 3: Participants' knowledge about hand hygiene and mode of transmission

		No	%
Hand Hygiene before and after treatment to protect	Health care workers	30	7.5
	Patients	28	7
	Environment	7	1.8
	All of the above	**335**	**83.3**
Most important mode of transmission	Hospital	23	5.8
	Air	20	5
	Hands	71	17.8
	Food	13	3.3
	All of the above	**273**	**68.3**
1st choice to reduce transmission of infection	Mask	20	5
	Gloves	21	5.3
	Hand hygiene	90	22.5
	Gowns	3	0.8
	All of the above	**266**	**66.5**

Table 4: Participants' practice towards standard precautions

		No	%
Using alcohol for decontamination	Always	310	77.5
	Not always	65	16.3
	Rarely	24	6
	Total	**399**	**100.0**
Wearing protective masks	Always	341	85.3
	Not always	38	9.5
	Rarely	21	5.3
	Total	**400**	**100.0**
Sharing protective masks (should not be used)	Always	332	83
	Not always	28	7
	Rarely	40	10
	Total	**400**	**100.0**
Hand Hygiene for different patients	Always	239	59.8
	Not always	107	26.8
	Rarely	53	13.3
	Total	**399**	**100.0**
Care with infectious disease	Always	352	88
	Not always	15	3.8
	Rarely	33	8.3
	Total	**400**	**100.0**

Discussion

Knowledge and practice of standard precautions are very important in preventing HCAI and also in the protection of health care personnel from risk of acquiring infections especially from blood borne pathogens like HIV, HBV and HCV [5].

Knowledge and training in standard precautions, high risk perception and longer duration of professional experience have been shown to be associated with improved compliance with standard precautions among health workers [13].

Therefore, this study was conducted to assess the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 female. They were taken from hospitals in two district areas; the age range of respondents was 20-40 years and life time work experience varied between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience as shown in Table 1& Figures 1&2).

It was good to observe that most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept and said that it should be used in all situations not only in case of infections (Tables 2 & 3).

Regarding level of awareness, it was good to find that most of the physicians and medical students, had previous knowledge about standard precautions and more than 60% knew of its concept. Other measurements of knowledge among physicians and medical students have been illustrated in Figure 3.

The above mentioned results were in agreement with the study conducted by Ogoina et al., who found that the majority (91.6%) of the study participants had previously heard about standard precautions of infection control. Ninety seven per cent knew that standard precautions should be practised on all patients and laboratory specimens irrespective of diagnosis. But, in disagreement with them in finding that about 50% of their participants were ignorant of the WHO's recommendation that sharps/needles should never be recapped, bent or broken [10].

We are in agreement with the findings mentioned by Jha et al., among 81 study participants, 60 (74.1%) who were aware of infection control committees [6].

Regarding the practice of hand hygiene, 77.5%, 85.3%, 83% and 59.8% always practiced hand hygiene after touching patients, wearing protective masks, had personal protective equipment and bending the needles after usage, respectively (Table 4).

Similarly, the results reported by Jha et al., who mentioned that with regard to the practice of hand hygiene, 53 workers (89.8%) always practiced hand hygiene after coming in contact with blood or other body fluids of patients, 42 (68.9%) before touching patients and 58 (95.1%) after touching the patients. Out of 64 staff who actually handled patients, 59 wore gloves while cleaning waste material. Among 59 staff who were liable to come in contact, 57 (96.6%) used protective barriers like masks, gloves, aprons and goggles while serving HIV/TB patients [6].

On the other hand there was some differences in the study performed by Ogoina et al., who found that the practice of hand hygiene, 58.5%, 28.1% and 63.6% always practiced hand hygiene after touching patients, after touching patients' surroundings and after removing gloves, respectively. Eighty two per cent always wear gloves before venepuncture [10].

The knowledge score as well as the practice score for each participant was expressed as a percentage from the total score. More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

This was consistent with the study carried out by Ogoina et al., in which the overall knowledge scores were generally high. However, in contrast with the same study in finding poor practice of the various elements of standard precautions of infection control, especially among less experienced health workers [10].

In other studies from Nigeria, less than 40% of health workers from Enugu,[14] Abuja[15] and Asaba[16] had poor knowledge of the basic elements of standard precautions

Also, we were in disagreement with studies from other parts of Nigeria [16,17] as well as studies from other parts of the world[10] in which poor practice of the various elements of standard precautions of infection control was reported.

The wide variation in knowledge and practice score regarding the various elements of standard precautions of infection control among health workers worldwide can be explained by variation in demographic characteristics and difference in training and qualification of HCW.

Conclusion

More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

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Post-cardiac surgery health related quality of life: A Saudi cross sectional study in Jeddah

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Abstract

Background: Cardiac surgery is rapidly evolving in Saudi Arabia with a need to address its late post-operative health related quality of life (HRQol).

Methods: This was an analytic cross-sectional study of 83 post-cardiac surgery Saudi patients (72.3% males & 27.7% females), aged 58.48 ± 12 years, seen > 5 months after surgery. They were selected from King Abdullah Medical Complex in Jeddah between September and November 2019 using a non-probability convenient sampling tech- nique. Their medical records were reviewed and the patients were interviewed by phone to answer the SF-36 HRQoL questionnaire.

Results: Patients had non-disability total (68.9±23.2), physical (63.4 ±26.5) and mental (68.3±30.7) summary scores with only 24.1% of patients with a disability score. Compared to patients with non- disability, patients with disability had significantly more medical comorbidities (p=0.007) such as hypertension (p=0.13), diabetes (p=0.002), and cerebrovascular stroke (p=0.033). There was a significant negative correlation between age and HRQoL with disability (r -=0.314, p=0.012).

Conclusion: Post-cardiac surgery Saudi patients had an accepted HRQoL months after their surgery that could deteriorate later with their advancing age. Disability was seen in those with medical comorbidities such as hypertension, diabetes and stroke. We recommend paying more attention to elderly patients and those with comorbidities who will undergo cardiac surgery in order to improve their long lasting HRQoL.

Key words: post cardiac surgery, HRQoL, Saudi Arabia

Introduction

The World Health Organization has defined health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (1). Health-related quality of life (HRQol) is a multidimensional concept which includes physical, mental, emotional, and social functioning (2).

HRQoL is a major concern of the patients before any surgery, and especially cardiac surgery, as the heart is a major vital organ (3). Whatever the cause for which open heart surgery is performed; the final aim is to prevent premature mortality as well as morbidity including ensuring high quality of life (4,5). Post-operative HRQoL research gives the evidence-based answer of the patient's questions about how their lives will be affected, and for how long (3-14) after cardiac surgery. There are many factors that affect HRQoL postoperatively based on previous research such as gender (6,7,8), diabetes mellitus (6,8,9), smoking (9), previous stroke (9,10), and psychiatric disturbances (9,11,12). However, prediction of HRQoL by age is still a matter of controversy (10,13,14).

Review of literature has retrieved a lot of studies concerned with post-coronary artery bypass graft (CABG) HRQoL rather than any other cardiac surgery including the more frequently performed valvular surgeries (3-14).

Saudi Arabia has one of the most evolving health care systems with an increasing number of governmental cardiac centers (15). The Saudi Ministry of Health statistical yearbook has reported 59,321 cardiac, chest and vascular surgeries in 2018 in the kingdom (15). However, no Saudi studies had addressed the topic of post cardiac surgery HRQoL. Therefore, the aim of our study was to measure the HRQoL at least 5 months after open heart surgery for different etiologies, and to determine the associated factors in Saudi patients.

Methodology

This was an analytic cross-sectional study of 83 post-cardiac surgery patients. The data were collected starting in September 2019 and continued for 3 months using a non-probability convenient sampling technique. Patients were selected from the operation room's list of patients who had cardiac surgery at King Abdullah Medical Complex in Jeddah, Saudi Arabia from January 2017 to April 2019. We selected 83 patients out of 113 patients on the list if they had their surgery within the last 5 months or before. Medical records were reviewed for selected cases and the patients were interviewed for their HRQoL by phone call which lasted for 15 to 30 minutes after taking their verbal consent. HRQoL was measured using the validated Short-Form Health Survey 36-Item (SF-36) in Arabic (16,17). Exclusion criteria were Hajj or Omra patients, patients with no retrieved file numbers, incomplete data, did not reply to the phone call, refused to participate in the study or had mental or chronic debilitating conditions like advanced malignancy or end organ failure.

Medical data from medical records included demographic data, postoperative complications and co-morbidities such as diabetes mellitus, hypertension, history of stroke, and smoking. Complications included wound infection, sepsis, cardiac events like attacks of acute coronary syndrome, complete heart block, atrial fibrillation, heart failure, cardiac tamponade, and cardiac arrest, chest affection such as infection, pneumothorax, hemothorax, lung collapse and respiratory distress, plural effusion, stroke or brain infarction, bedsore and reopening.

SF-36 survey covered both physical and mental functioning. The mental health summary score was the mean of emotional well-being, emotional role-limitation, social function, and energy scores. The physical health summary score was the mean of Physical functioning, physical role-limitation, pain, and general health (16, 17). Each patient was scored from 0 to 100 according to the response. A score less than 50 was disability, 0 was maximal disability, and from 50 to 100 was non-disability. The study received ethical approval from the Research and Studies Department- Jeddah Health Affairs at the Saudi Ministry of Health as well as from the Ibn Sina National College Ethical Committee. All patient's data were preserved with confidentiality.

Statistical Analysis

All data were analyzed and Figure 1 was constructed using the SPSS 17.0 software for Windows (PASW statistics 17). Continuous variables were summarized as the mean and standard deviation (SD) and categorical variables as frequency and percentages. Computed variables were used to calculate the summary scores. Patients were divided according to their total HRQoL into 2 groups with and without disability. Comparison between both groups was performed used independent –Samples T test for continuous variables and Chi Square test for categorical variables. Pearson correlation was used to test correlations between different variables with normal distribution. For all statistics, a two-sided p-value <0.05 was considered statistically significant.

Results

A total of 83 patients were enrolled in this study, 60 (72.3%) were males and 23 (27.7%) were females, aged 58.48 ± 12 years. Type of cardiac surgery was mainly CABG (74.7%), while valvular heart surgery represented only 10% and the remaining 11% were post both CABG and valvular heart surgeries. Post-operative complications were reported in a substantial percentage of patients (42.2%). Patients were interviewed after a mean duration of 15.67±7.72 months after surgery.

Some (32.5%) patients were smokers and some had comorbidities (hypertension (61.4%), diabetes (60%) and post-cerebrovascular stroke (8.4%)). Patients had non-disability total score (68.9±23.2) as well as both physical (63.4 ±26.5) and mental (68.3±30.7) summary scores with only 20 (24.1%) patients who had a disability score (Table 1).

Comparison between patients with disability scores and patients without is seen in Table 2. HRQoL disability was not related to age (p=0.101), gender (p=0.403), post-operative complications (p= 0.416), or post-operative duration (p=0.418), but it was related to the presence of comorbidities (p=0.007) such as hypertension (p=0.13), diabetes (p=0.002), and previous cerebrovascular stroke (p=0.033) (Table 2). There was a significant negative correlation between age and HRQoL with disability (Figure 1) (r -=0.314, p=0.012).

Table 1: The descriptive characteristics of the post-cardiac surgery patients

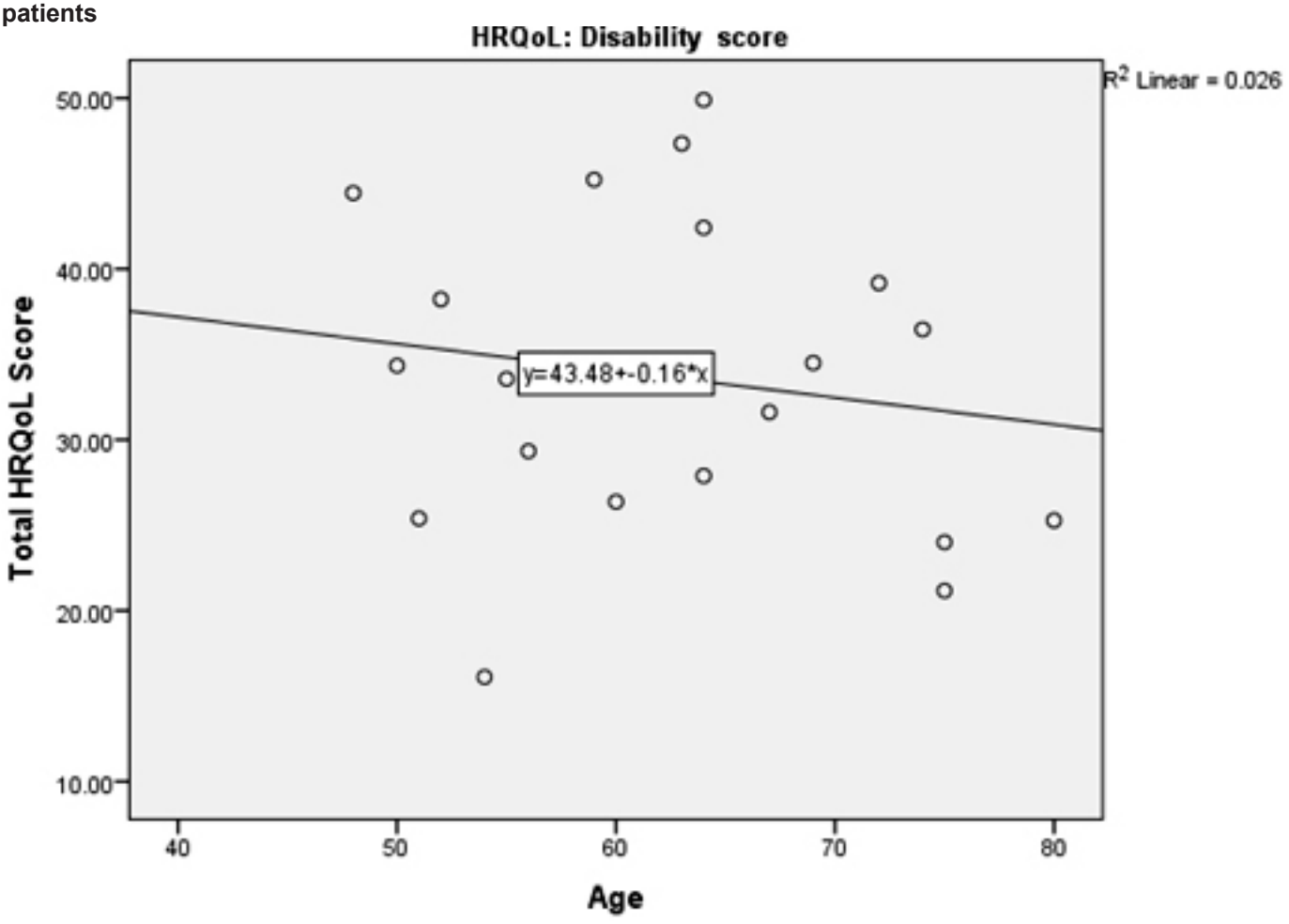
Variables		Value
Age in years: Mean ± SD		58.76±11.92
Gender: n (%)	Males	60 (72.3)
	Females	23 (27.7)
Type of cardiac Surgery: n (%)	CABG:	62(74.7)
	Valve	10(12.0)
	Both	11(13.3)
Post-operative Complications: n (%)		35(42.2)
Post-operative duration in months: Mean ± SD		15.67±7.72
Co-morbidities: n (%)	Hypertension	51(61.4)
	Diabetes	50(60)
	Post-Stroke	7(8.4)
Smoking: n (%)		27(32.5)
HRQOL score: Mean ± SD	Physical summary score	63.4 ±26.5
	Mental summary score	68.3±30.7
	Total score	68.9±23.2
HRQoL with disability: n (%)	20(24.1)	
HRQoL with non-disability: n (%)	63(75.9)	

Table 2: Comparison between patients with and without disability HRQoL scores

		Disability HRQOL score (n=20)	Non-disability HRQOL score (n=63) Mean ± SD	P
Age in years: Mean ± SD		62.60±9.48	57.57±12.42	0.101
Gender: n	Males	13	47	0.403
	Females	7	16	
Post-operative duration in months: Mean ± SD		16.90±7.867	15.29±7.693	0.418
Smoking: n	Yes	7	20	0.787
	No	13	43	
Comorbidities: n	Yes	20	45	0.007*
	No	0	18	
HTN: n	Yes	17	34	0.013*
	No	3	29	
DM: n	Yes	18	32	0.002*
	No	2	31	
CVA: n	Yes	4	3	0.033*
	No	16	60	
Post- operative Complications: n	Yes	10	25	0.416
	No	10	38	

*P is significant <0.05

Figure 1: Significant negative correlation between age and disability HRQoL in post-operative cardiac surgery patients



Discussion

We found an acceptable HRQoL (68.9 ± 23.2) among 83 Saudi patients seen months after cardiac surgery regardless of their age, gender, type of surgery, duration of postoperative period, or post- operative complications. About a quarter of patients (24%) had disability which was significantly related to aging (p=0.012) and to the presence of medical comorbidities (p=0.007) such as hypertension, diabetes, and history of stroke.

Previous studies reported a conflicting association between HRQoL and age (10,13,14). In this study, there was a significant negative correlation between age and disability HRQoL (r -=0.314, p=0.012) despite the absence of any significant difference in age of patients with and without disability (p=0.101). These contradictory results of our study concerning the age may be explained by our short post-operative duration of only a few months. It might be speculated that over years rather than over months, the advancing age will negatively influence the HRQoL. This is seen in one prospective study of 272 patients who had a deteriorating physical component of their HRQoL 10 years after CABG despite its improvement 5 years post-surgery (18).

In contrast to other studies (6-8) which showed better HRQoL among males compared to females, we did not find any significant gender differences. similarly, gender was found to have no influence in another study (10).

Our results showed that smoking did not influence the HRQol. While this finding agrees with one study (10), it is in contrast to another (9) which reported a negative effect of smoking a year post-surgery. One possible explanation is the difference of the post-operative period between different studies.

In our study, while the immediate post-operative complications did not influence the HRQoL few months after surgery, the presence of comorbidities was the only single significant difference between those with and without disability (Table 2). Our findings agree with other studies which reported negative effects of diabetes mellitus (6,8,9) and stroke (9,10) on the post-cardiac surgery HRQoL. In contrast to our study, one study found that both hypertension and diabetes mellitus had no significant impact on HRQoL; while history of stroke and myocardial infarction were the strong predictors post-CABG (10).
In conclusion, post-cardiac surgery Saudi patients had an acceptable HRQoL many months after their surgery that could deteriorate later with their advancing age. Disability was seen in those with medical comorbidities such as hypertension, diabetes and stroke. We recommend paying more attention to elder patients and those with comorbidities who will undergo cardiac surgery in order to improve their long lasting HRQoL.

The main strength of our research is the inclusion of post-cardiac surgery of Saudi patients who had their heart surgery performed in a Saudi cardiac center as there is no published data about their HRQoL. Another strong point is the inclusion of post-valvular heart surgeries in the survey as almost all previous research work concentrated on post-CABG surgery.

On the other hand, there are several limitations in this study. First, the cross-sectional design that limits the conclusions about the cause-and-effect relationships between different variables and HRQoL. Second, the SF- 36 method is generic rather than specific tool with inherited limitation to detect disease-specific outcomes, and therefore our results cannot be generalized to all post-cardiac surgery among Saudis.

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Prevalence of De-Quervain's Tenosynovitis Among Medical Professionals

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Abstract

Background: De-Quervain's tenosynovitis is a condition that involves tendon entrapment, affecting the first dorsal compartment of the wrist. While the exact cause of De-Quervain's tenosynovitis is unclear, it is associated with repetitive wrist motion, specifically motion requiring thumb radial abduction and simultaneous extension and radial wrist deviation. The purpose of the study is to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Objective: The purpose of the study was to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Methodology: A cross-sectional survey was conducted among medical professionals in the Makkah region. Participant sample size was 354 students, selected through convenience sampling. Data was collected from medical professionals through a self-administered questionnaire and the severity of pain was assessed through the Universal Pain Assessment Tool. De-Quervain's tenosynovitis was diagnosed through the Finkelstein test.

Result: The Finkelstein test showed positive results (67%, n=238) when done on students. The majority of the participants had a positive Finkelstein test with a higher count (59%, n=211) for female participants. As the frequency of mobile phone usage increased, with more than 200 text messages sent per day (p value 0.000), progressively more people showed a positive Finkelstein test. An analysis of the association between the Finkelstein test and frequency of texting showed that 67% of people who used their mobile phone for texting were positive for the test.

Conclusion: De-Quervain's tenosynovitis is a critical cause of hand dysfunction for health care providers. Further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under-documented cause of tendinopathy.

Key words: De-Quervain's, Tenosynovitis,
Hand held devces, Mobile phones,
Text message injury

Introduction

De-Quervain's tenosynovitis is an inflammatory disease caused by the chronic misuse of the tendons of the extensor pollicis brevis and abductor pollicis longus muscles. Modifications in normal kinematics and anatomical determinants of a tendon in professionals are common, which may be the cause of this disease; little is known about the prevalence of this disease in medical professionals [1]. De-Quervain's could be presented as a painful wrist secondary to stenosing tenosynovitis of the thumb abductors around the radial styloid. With new occupational and professional demands the prevalence of this condition is gradually increasing. Activities that involve repeated thumb pinching and wrist movement can cause this painful condition. In the literature, this condition has various synonyms, including De-Quervain's disease, first dorsal compartment tenosynovitis, texting tenosynovitis, Blackberry Thumb, and Washer Woman's Sprain. De-Quervain's tenosynovitis is triggered by a stenosing inflammation of the tendon sheath in the first dorsal compartment of the wrist. The patient may experience associated symptoms beside pain, including dysesthesias, numbness, tingling, burning, and cramping. The most standard finding in De Quervain's tenosynovitis is a positive Finkelstein test [2]. In a big community-based study from the UK, prevalence of De-Quervain's tenosynovitis was 1.3% for women and 0.5% for men [3]. This was linked to a substantial impact on daily events. The incidence and prevalence of De-Quervain's tenosynovitis in primary care is still unknown [3]. Previous reports reveal multiple etiologies for De-Quervain's tenosynovitis that comprise acute trauma or tremendous exercise. However, it may more commonly be a consequence of accumulative micro-trauma. Therefore, those who use their hands and especially their thumb in monotonous routines are prone to get De-Quervain's. The patients may also experience progressive pain and limitation of thumb range of motion [4]. The purpose of the study is to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals.

Methodology

A cross-sectional survey was conducted among medical professionals in the Makkah region, Saudi Arabia. We included all undergraduate medical students and allied medicine students at Makkah region, Saudi Arabia who performed the Finkelstein test, completed Quick-DASH score and completed the survey. The participant sample size was 354 students who were selected through convenience sampling. Data were collected from medical professionals through a validated questionnaire run by multiple orthopedic surgeons, and severity of the pain was assessed through the Universal Pain Assessment Tool. De-Quervain's tenosynovitis was diagnosed through the Finkelstein test, in which the participants were instructed to make a fist with the thumb enfolded inside the fingers. They stabilized their forearm and passively deviated the wrist. Pain at the radial wrist over the abductor pollicis longus and extensor pollicis brevis tendons indicated a positive test.

Data entry and analysis: Data entry and analysis were performed by using SPSS version 20 software. Frequency and percentages were obtained for the categorical variable. Chi-square was applied to determine the association between different variables and the Finkelstein test. P value < 0.05 is considered significant.

Application: Repetitive use of mobile phones for text messaging can lead to the damage of extensor pollicis brevis and abductor pollicis longus muscles of the thumb and their tendons, which pass through the first dorsal compartment of the wrist.

Results

Out of the total number of students who participated in the study, 85.9% (n=304) were female while 14.1% (n=50) were male. Most of the participants were in medical school (75.7%, n=268) as a specialty, with the majority in their sixth medical school year (33.3%, n=118). Most of the participant were 23-27 years old. The majority (92%) were right handed dominant, while 8% were left handed dominant [Table 1].

It was noted that as frequency of mobile phone usage progressively increased, more and more people showed a positive Finkelstein test when they sent more than 200 text messages per day (p value 0.000). An analysis of the association between the Finkelstein test and frequency of texting showed that 67% of people who used their mobile phone for texting were positive and 33% were negative for the test [Table 2].

In terms of thumb movements, 42% (n=150) had restriction of thumb movements, 44% (n=158) had pain while compressing the area, and 40% (n=142) had pain on resisted thumb extension [Table 2].

The Finkelstein test was positive in 67% (n=238) of the students. The majority of participants had a positive Finkelstein test, with a higher count for female participants (59%, n=211) [Table 3].

Almost all of the students frequently used cell phones for texting; only 37% (n=132) texted less than 50 messages per day. Another 34% (n=122) sent between 50–100 texts, 17% (n=62) between 100–200, and 10% (n= 38) sent more than 200 messages per day [Table 4].

Our study found there is a significant relationship between a positive Finkelstein test and medical specialty [Table 5]. More than 50% of the participants had a Quick-DASH score of more than 46 points, with a mean of 16 and a median of 11.3, which indicates a moderate to severe disability [Table 6] [Figure 1].

Table 1: Demographic characteristics of the participants

		Frequency	Percent	Cumulative Percent
Gender	Female	304	85.9	85.9
	Male	50	14.1	100.0
Age	23-27	208	58.8	58.8
	18-22	134	37.9	96.6
	28-32	12	3.4	100.0
Academic year	Preparatory	18	5.1	100.0
	2	19	5.4	94.9
	3	40	11.3	81.9
	4	55	15.5	70.6
	5	77	21.8	55.1
	6	118	33.3	33.3
	Internship	27	7.6	89.5
Medical College	ISNC	242	68.4	68.4
	KAU	44	12.4	80.8
	Others	18	5.1	85.9
	UQU	14	4.0	89.8
	KSAU Jeddah	13	3.7	93.5
	University of Jeddah	12	3.4	96.9
	Farabi	6	1.7	98.6
	BMC	5	1.4	100.0
Medical specialty	Medicine	268	75.7	75.7
	Allied medical science	81	22.9	98.6
	Non-medical	5	1.4	100.0

ISNC: Ibn Sina National College for Medical Studies, KAU: King Abdulaziz University, UQU: Umm Al Qura University, KSAU: King Saud Bin Abdulaziz University for Health Sciences, Farabi: Al Farabi Private College, BMC: Batterjee Medical College.

Table 2: Mobile phone use and number of text messages

		Frequency	Percent	Cumulative Percent
Mobile phone use for texting	Always	262	74.0	74.0
	Sometimes	73	20.6	94.6
	Occasionally	11	3.1	97.7
	Never	8	2.3	100.0
Number of text messages per day	<50	132	37.3	37.3
	50-100	122	34.5	71.8
	100-200	62	17.5	89.3
	>200	38	10.7	100.0

Table 3: Association between Finkelstein Test and all variables

		Finkelstein test		Total
		Negative test	Positive test	
Gender	Female	93	211	304
	Male	23	27	50
Age	18-22	36	98	134
	23-27	76	132	208
	28-32	4	8	12
Academic year	Preparatory	7	11	18
	2	9	10	19
	3	9	31	40
	4	11	44	55
	5	26	51	77
	6	47	71	118
	Internship	7	20	27
Medical College	BMC	0	5	5
	Farabi	3	3	6
	ISNC	78	164	242
	KAU	19	25	44
	KSAU Jeddah	4	9	13
	University of Jeddah	2	10	12
	UQU	1	13	14
	Others	9	9	18
Medical specialty	Medicine	90	178	268
	Allied medical science	23	58	81
	Non-medical	3	2	5
Dominant hand	Left hand	5	23	28
	Right hand	111	215	326
Pain while compressing the area	No	106	90	196
	Yes	10	148	158
Pain on resisted thumb extension	No	103	109	212
	Yes	13	129	142
Pain experience	Right hand	47	105	152
	Left hand	9	19	28
	Both	13	114	127
	None	47	0	47
Use of mobile phone for texting	never	0	8	8
	occasionally	9	2	11
	sometimes	33	40	73
	always	74	188	262
Number of text messages per day	<50	50	82	132
	50-100	37	85	122
	100-200	17	45	62
	>200	12	26	38
Restriction with thumb movement	no restriction	72	88	160
	mild	17	74	91
	moderate	20	68	88
	severe	7	8	15

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Table 4: Association between Finkelstein Test and number of messages

(I) Number of text messages per day	(J) Number of text messages per day	Mean Difference (I-J)	Std. Error	P - value
<50	50-100	-.25460-	1.68757	1.000
	100-200	-2.00391-	2.06885	1.000
	>200	-15.17145-*	2.47376	.000
50-100	<50	.25460	1.68757	1.000
	100-200	-1.74931-	2.09577	1.000
	>200	-14.91686-*	2.49632	.000
100-200	<50	2.00391	2.06885	1.000
	50-100	1.74931	2.09577	1.000
	>200	-13.16754-*	2.76837	.000
>200	<50	15.17145*	2.47376	.000
	50-100	14.91686*	2.49632	.000
	100-200	13.16754*	2.76837	.000

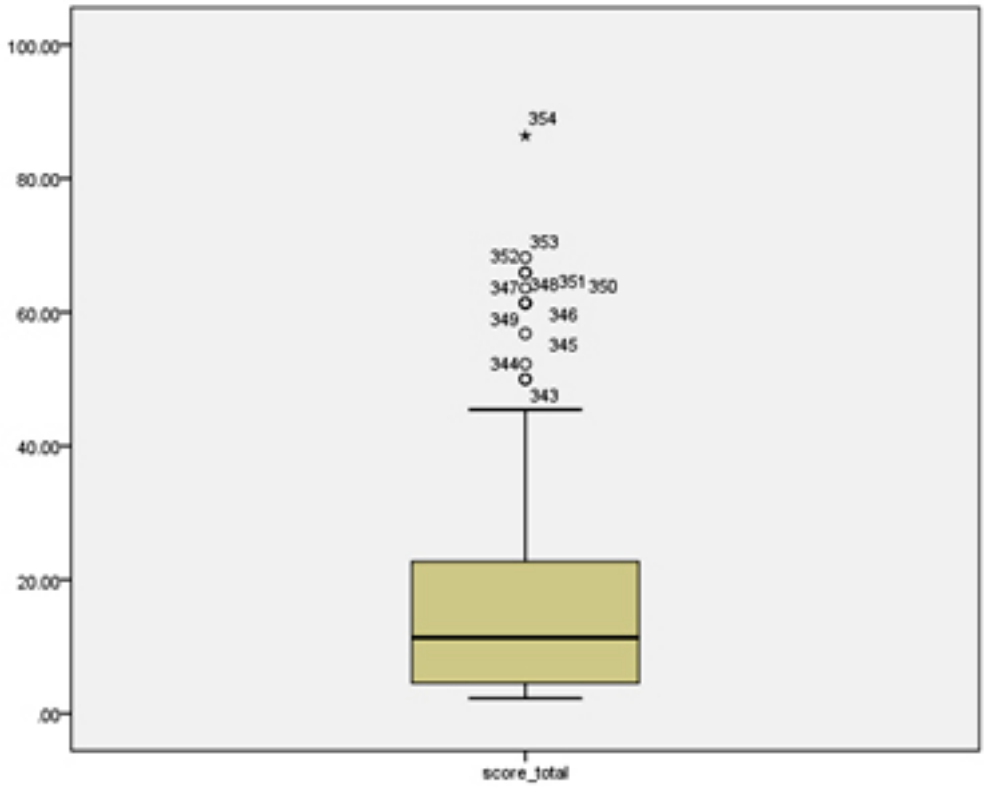
Table 5: Relationship between Finkelstein Test and medical specialty

(I) Medical specialty	(J) Medical specialty	Mean Difference (I-J)	Std. Error	Sig.
Medicine	Allied medical science	-5.64130-*	1.75953	.004
Allied medical science	Medicine	5.64130*	1.75953	.004

Table 6: Quick DASH score

			Statistic	Std. Error
Score total	Mean		16.0824	.75211
	95% Confidence Interval for Mean	Lower Bound	14.6033	
		Upper Bound	17.5616	
	5% Trimmed Mean		14.6236	
	Median		11.3636	
	Variance		200.246	
	Std. Deviation		14.15081	
	Minimum		2.27	
	Maximum		86.36	
	Range		84.09	
	Interquartile Range		18.75	
	Skewness		1.516	.130
	Kurtosis		2.857	.259

Figure 1: Distribution of participants Quick DASH score



Discussion

Notwithstanding its common presentation as an upper extremity musculoskeletal problem, the epidemiology of De-Quervain's tenosynovitis is not well known. Nevertheless, analogous surveillance to our research was seen in a study conducted by Lenhart et al., with 50% positive results for those texting 50 messages per day and 33% positive results amongst those sending 100 text messages per day [5]. Our results were significant when different hand movements were compared to results of the Finkelstein test. This was in harmony with the previous literature that obviously showed repetitive, extended, and sustained gripping and repetitive redundant movements of the thumb (e.g., chatting) as potential risk factors for De-Quervain's tenosynovitis [6,7]. In order to prevent the development of such a musculoskeletal disorder, an improved understanding of the texting technique and its relationship to muscle movement and kinematics is necessary. De-Quervain's tenosynovitis is a critical issue leading to dysfunction of the affected hand, for which further awareness would help researchers develop a background for physical guidelines for mobile texting and recommend suitable behavioral variations for avoiding this under documented cause of tendinopathy [8]. The diagnosis of De-Quervain's tenosynovitis is made by taking a history and thorough physical examination. Symptoms could include pain at the radial styloid occasionally radiating to the thumb, forearm, or shoulder, as well as swelling at the radial styloid with tenderness and crepitation with palpation. Finkelstein's test (deviating the wrist to the ulnar side, while grasping the thumb, resulting in pain) is in typical cases positive. In our study we found that the Finkelstein test showed positive results (67%, n=238) for the participating students. The majority of participants had a positive Finkelstein test, with a higher count (59%, n=211) for female participants [Table 3]. Unfortunately, there is no diagnostic test for De-Quervain's tenosynovitis. Efforts were made in 1998 and 2001 to hypothesize a consistent categorization and case-definition for soft-tissue rheumatic disorders of the upper limb, including De-Quervain's tenosynovitis [9-11]. When considering medical students, the most common causes related to SMS message texting include academic associated activities [12]. De-Quervain's tenosynovitis most commonly results from the overuse of thumb musculature, which is illustrated by pain that blows over the surface of the radial aspect of the wrist and is exaggerated by ulnar deviation of the hand [13]. We found in our study that 42% (n=150) had restriction with thumb movement, 44% (n=158) had pain while compressing the area, and 40% (n=142) had pain on resisted thumb extension [Table 2]. The prevalence of this complaint increased with new professional demands, like prolonged work on a computer [14]. In the last decade only, the 15–24 year-old age group in Sweden has had 100% access to mobile phones and 93% on average utilize it for sending text messages (SMS) [15]. Use of mobile phones has increased in the USA in teens for text messaging, from 38% in 2008 to 54% in 2009 [16]. Regarding the use of cell phones, we found that 67% (n=238) who used their mobile phone for texting had a positive Finkelstein test. Almost all of the students frequently used cell phones for texting, and out of this group, 37% (n=132) texted less than 50 messages per day. Another 34% (n=122) sent between 50–100 texts, 17% (n=62) between 100–200, and another 10% (n= 38) more than 200 messages per day. Thus, as texting increased, the prevalence of the condition increased [Table 4]. A bilateral De-Quervain's tenosynovitis case report in 2010 showed the diagnosis'

association with the patient's condition and an extreme routine of text messaging on a cell phone [17]. Clinical evaluation revealed that for a majority of the participants, the right hand was more commonly affected (92%) when compared to the left hand and bilateral association. The most common symptoms described by the participants during examination were pain on the thumb, pain on resisted thumb extension, pain while compressing the area, and restriction of thumb movement.

Conclusion

In order to prevent the development of musculoskeletal disorders, an improved understanding of the texting technique and its relationship to muscle movement and kinematics is necessary. De-Quervain's tenosynovitis is a common cause of hand dysfunction, and further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under the documented cause of tendinopathy. We advise mobile phone users to use both hands, have multiple breaks, slow typing, and give proper support to their forearms and back while texting.

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Assessment of Post Sleeve Gastrectomy patient's satisfaction and their desire for body contouring surgery in Taif City Saudi Arabia

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Abstract

Background: Bariatric surgery is one of the suggested treatment modalities for obese patients at high risk of morbidity and mortality who have not achieved excepted weight reduction through lifestyle changes or medical management.

Objectives: The study aimed to assess the satisfaction of patients who have undergone bariatric surgery in the city of Taif.

Subjects and methods: An online survey using a Post-Bariatric Satisfaction Questionnaire was used to collect responses from patients who had undergone bariatric surgery at two specialty hospitals in the city of Taif. Responses were recorded using a 5-point Likert scale, which mainly focused on cosmetic and body contouring concerns. Appropriate statistical tests were used to analyze the data obtained. Data were presented mainly as frequencies and percentages.

Results: The mean age of the participants was 37± 14.5 years and included 54.6% males and 45.4% females. Obesity was the leading reason for opting for bariatric surgery as reported by 66.7% of the participants. The response regarding satisfaction showed that 32.25% and 42.6% of the participants were very satisfied with the general appearance and weight loss respectively. There was also a huge percentage of reduction of co-morbidities like hypertension and Type 2 diabetes mellitus after the surgery.

Conclusion: Satisfaction from bariatric surgery showed it was not only effective in a reduction in weight but also was found to affect reduction of co-morbidities which drastically improved the quality of life. Patients should be made aware of the benefits and the limitations of these types of surgeries in morbid obesity management.

Key words: bariatric, surgeries, satisfaction, body, contouring, Taif

Introduction

The prevalence of obesity has increased dramatically over the last few decades and is commonly associated with co-morbidities such as type 2 diabetes mellitus (T2D) and hypertension. Studies show that this has drastically affected the quality of life of many people [1,2]. Bariatric surgery remains the most effective treatment solution to weight loss for the people with a body mass index of 35 kg/m2 or more [3].

The bariatric surgical procedures are categorized mainly into three by function: restrictive, primarily mal-absorptive and combined (restrictive and mal-absorptive). The restrictive procedures include Laparoscopic adjustable gastric banding (LAGB), Vertical banded gastroplasty, and Laparoscopic sleeve gastrectomy (LSG). The Combined restrictive and malabsorptive procedures include Roux-en-Y gastric bypass (RYGB), Biliopancreatic diversion with or without duodenal switch and Malabsorptive procedures including Jejunoileal bypass [4].

Although these procedures are a permanent solution, the most commonly known types of bariatric surgeries done are Laparoscopic adjustable gastric banding, vertical sleeve gastrectomy, Roux-en-Y gastric bypass, and biliopancreatic diversion with duodenal switch [5].

Following the bariatric surgery, sudden and massive weight loss can lower the skin tone and leads to a failure of the excess soft tissue to retract, resulting in redundant and excess skin which is commonly located on the belly, upper arms, thighs, and buttocks; some patients become less satisfied with their body image and they want to undergo body-contouring surgery to restore a normal body image [6]. Also, some patients show an improvement in their chronic disease, especially diabetes and hypertension following bariatric surgery, which is now considered as metabolic surgery. According to the American Diabetes Association Guidelines of 2009, diabetic patients with BMI ≥35 kg/m2 could be considered for bariatric surgery [7].

A marked improvement in hyperglycemia, with the rate of type 2 diabetes remission varies depending on the type of surgery [8]. Studies show that short term results of surgery showed rapid improvement in hepatic insulin sensitivity which could be due to restricted calorie intake or the restoration of first-phase insulin secretion [9,10]. The mid and long-term results are usually evident in skeletal muscle's insulin absorption and also in improvement in survival and decrease in the incidence of cardiovascular events [9-11].

A study done by Sjöström et al. reported a higher remission rate of 73% after metabolic surgery [12]. The definition of remission varies from study to study but is generally defined as normoglycemia without any further use of glucose-lowering medications. Some of the complications that might occur post-surgery are mainly physiological in nature that includes dumping syndrome, vitamins and nutrients deficiency, renal stone formations and decrease of bone density. The mechanical complications include stenosis, gastric tube stricture or gastroesophageal reflux, etc. [13-15].

The success of Bariatric surgery does not only depend on the efficacy of the treatment and enhancing weight loss but also reflects on the satisfaction of patients.

In the kingdom of Saudi Arabia, the problem of obesity is a major reason for morbidity and is always associated with some co-morbidities. Bariatric surgeries are gaining popularity among the Saudi population. Very little data is available from the kingdom regarding the type of bariatric surgeries performed and also the factors related to patient's satisfaction from those surgeries. Satisfaction from this type of surgery is not only a measure of the quality of life of patients but a multidimensional indicator that could improve the clinical outcomes, increase patient retention, and reduce the risk from medical negligence claims [16]. Hence this study was aimed to assess the impact of bariatric surgery and satisfaction of patients related to its efficiency.

Methodology

Study design: A Cross-sectional study using a web-based survey was conducted.
Sampling methodology: The study participants were patients on whom bariatric surgeries were performed at Al-Hada military hospital and Prince Mansour Military hospital.
Inclusion criteria: Patients who had undergone sleeve gastrectomy during the period from 2014 to the last 6 months of 2019. Both sexes were between 18 to 60 years old, and those who had sleeve gastrectomy in Al Hada Military hospital and Prince Mansour hospital were included.
Exclusion criteria: Patients who had other types of bariatric surgeries, who had completed the operation in less than 6 months and patients, who did not give consent or/and who did not complete the survey, were excluded.
Study instrument: We used the Post-Bariatric Satisfaction Questionnaire developed by Kitzinger, et al. for our study. This questionnaire includes data on satisfaction with BI, QOL, and expectations from body contouring surgery [17,18]. This questionnaire usually takes about 5 minutes to complete and focuses mainly on the satisfaction of patients with their appearance after massive weight loss and quantifies patient satisfaction on a five-point Likert scale (strongly satisfied to strongly dissatisfied). Also, it recorded cosmetic and body contouring concerns that originate after sleeve gastrectomy. The questionnaire also includes details about demographic data and expectations from body contouring surgery. The study was explained to the patients, and informed consent was obtained from them. The questionnaire promised confidentiality and a statement of anonymity was explained in the first part of the survey.

The survey link was sent to the phone numbers of these participants that were collected from the operation room log book. 108 patients responded completely to all the questions of the survey and we included the data collected from these patients for our assessment.

Ethical considerations

The Ethical Review Committee of Taif University and Al-Hada military hospital approved the study. All patients were informed about the purpose and benefits of the study before taking consent.

Data Analysis

Data collected were analyzed using the SPSS statistical analysis program version 23. Descriptive statistics were expressed as number and percentages.

Results

Our study included 108 participants who underwent sleeve gastrectomy surgery, of which 49 were females and 59 were males. The mean age was 37± 14.5 years old (range from 22-60).

When the reason for or cause of performing bariatric surgery was assessed, obesity 72 (66.7%) alone was the main reason reported by the participants. 15% of the participants also reported obesity with associated co-morbidities for choosing the surgery (Figure 2). The majority of our participants 84 (77.8%) were staying at the hospital for 1-3 days and only 10 (9.3%) suffered from postoperative complications.

To rate the satisfaction about general appearance, weight loss and shape of different parts of the body after bariatric surgery the participants were able to select 1 of 5 options from very dissatisfied through to very satisfied. 34.25% of participants were very satisfied with their general appearance and 42.6% were very satisfied with their 'weight loss'. Compared with women, men were more satisfied with their 'general appearance' (18.5%), and 'weight loss' (25.0%). The most common area with which participants were satisfied after surgery was the buttock (25.0%), followed by the arms (24.1%) and the least was belly (13.9%) (Table 1).

The assessment showed that 17 out of 26 who had diabetes mellitus were completely cured after the bariatric surgery, and 9 (8.3%) of them reported decreasing the dose of medication. For hypertensive patients, 14 (13.0%) of them were cured completely after the surgery out of 22 who had the disease, whereas 8 (7.4%) of them had to decrease the dose of medication.

In our study, the mean weight loss was found to be 41.9 ± 18.2 kg and the maximum weight loss recorded was 78 kg. We found that 76.9% (n=83) of participants want to lose additional weight due to not reaching the desired weight after the surgery and most of them were males 43 (39.8%).

When the participants were asked whether they have been informed about the possibility of having excess skin after surgery, 84 (77.8%) have agreed to this. When the problems with excess skin after surgery were assessed, 9.3% of them always had itching on the areas where surgery was performed, whereas 10.2% had difficulty with fitting clothes and 12.0% had a difficulty of doing exercise (Table 3).

We found that the majority of participants who wanted to have a body contouring surgery 76 (70.4%) were females 39 (36.1%) (Figure 3).

In our study 39.8% (n=43) knew about the body contour surgeries and the most commonly reported area of concern of doing body contouring was belly 67.6% (n=73) followed by arms 46.3% (n=59). 32.4% (n=35) of the participants reported having fears of doing body-contouring surgery. The most common expectations among those that were associated with body contouring surgery were 'improvement in appearance' (53.7%) followed by 'easy mobility' (18.5%).

Table 1: Frequency of satisfaction rate after surgery according to general appearance and body parts

Satisfaction	General Appearance N (%)	Weight loss N (%)	Arms Shape N (%)	Breast Shape N (%)	Belly Shape N (%)	Back Shape N (%)	Buttock N (%)	Thighs N (%)
Very satisfied	37 (34.24%)	46 (42.59%)	26 (24.07%)	22 (20.37%)	15 (13.89%)	25 (23.15%)	27 (25.0%)	22 (20.37%)
Satisfied	34 (31.48%)	28 (25.93%)	34 (31.48%)	33 (30.56%)	25 (23.15%)	34 (31.48%)	35 (32.41%)	31 (28.7%)
Neutral	19 (17.6%)	12 (11.11%)	23 (21.30%)	25 (23.15%)	24 (22.22%)	31 (28.7%)	23 (21.3%)	25 (19.44%)
Dissatisfied	11 (10.18%)	14 (12.96%)	15 (13.89%)	23 (21.30%)	31 (28.7%)	13 (12.04%)	15 (13.89%)	21 (19.44%)
Very Dissatisfied	7 (6.5%)	8 (7.41%)	10 (9.26%)	5 (4.63%)	13 (12.04%)	5 (4.63%)	8 (7.41%)	9 (8.33%)

Figure 1: Gender Distribution of participants

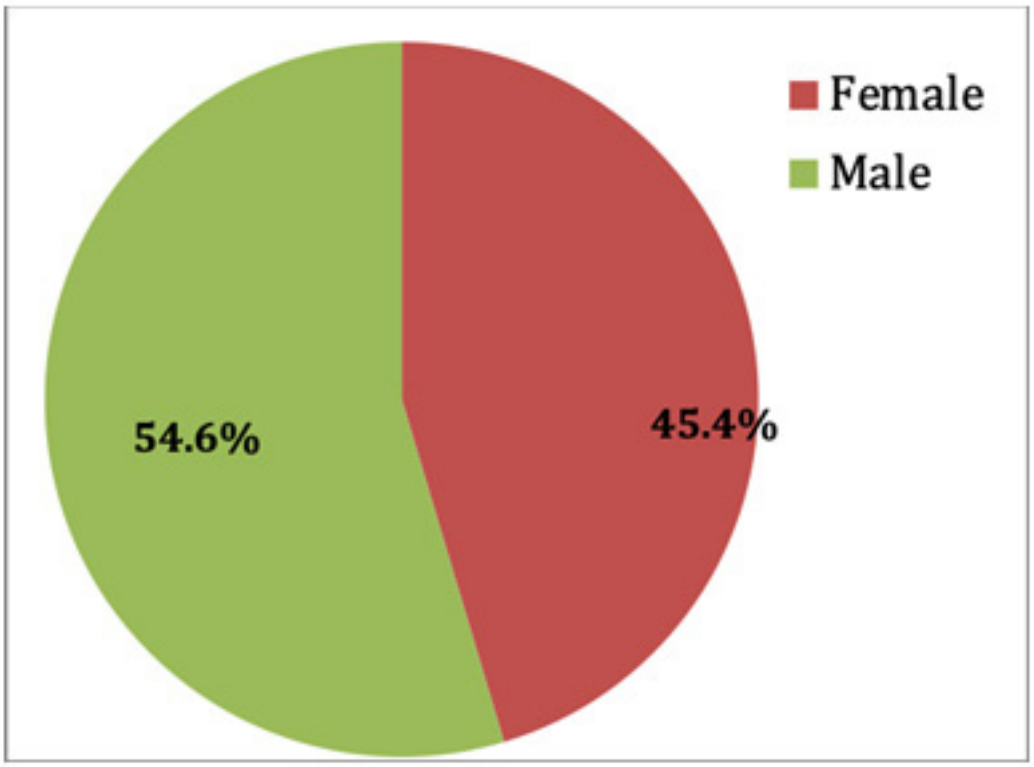

Figure 2: Distribution according to the cause of bariatric surgery

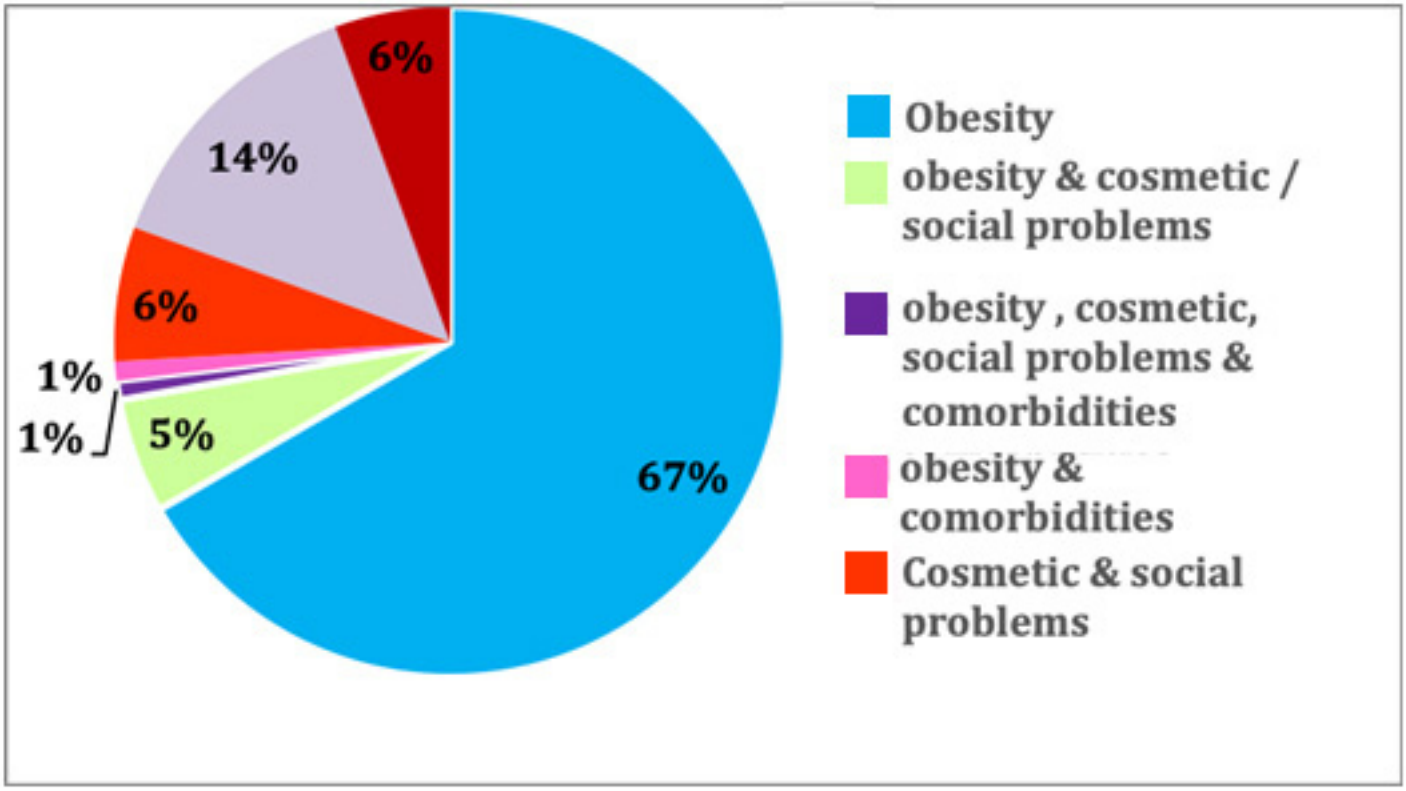

Table 2: Distribution according to the Effect of Sleeve Bariatric Surgery on Diabetes and Hypertension

After effects of bariatric surgery	Diabetes		Hypertension	
	N	%	N	%
Never had the disease	82	75.9%	86	79.6%
Decrease the dose of medication	9	8.3%	8	7.4%
Complete the cure	17	15.7%	14	13.0%
Total	108	100%	108	100%

Table 3: Distribution according to difficulties perceived by participants after surgery

	Itching		Difficulty Fitting Clothes		Difficulty Doing Exercise	
Never	72	66.7%	78	72.2%	69	63.9%
Sometimes	25	23.1%	19	17.6%	26	24.1%
Frequently	10	9.3%	11	10.2%	13	12.0%
Total	108	100%	108	100%	108	100%

Discussion

Our study assessed the satisfaction of patients to body parts, length of stay at the hospital and related complications among those who had undergone sleeve gastrectomy. To our knowledge, no other similar studies are being done in the Kingdom of Saudi Arabia assessing the satisfaction of bariatric surgery.

The results showed in our study, that the mean weight loss was found to be 41.9 ± 18.2 Kg and the maximum weight loss recorded was 78 Kg after performing sleeve gastrectomy. This loss of weight was found to be higher when compared to another study done in the USA by Lee JH et al on 162 patients where the reduction was reported to be 7.9±7.3 kg/m2. [19] Even though all surgeries led to weight reduction and/or BMI reduction, it was difficult to assess which type of surgery had better efficiency, as all the participants underwent sleeve gastrectomy. There is no clear evidence suggesting which type of surgery is more effective in weight loss as reports from different countries show no comparable weight loss according to the type of surgery performed [20,21].

The factors that predict weight loss or BMI reduction couldn't be limited just to associated co-morbidities such as diabetes, hypertension, age, gender, lifestyles, etc. [22].

The findings of our study showed that most of the participants stayed in the hospital for 1-3 days after surgery (n=84). Only 4 of them reported that they were hospitalized for more than 7 days post-surgery. Colquitt et al. reported that the RGYB procedure resulted in a greater duration of hospitalization out of two RCTs conducted (4/3.1 versus 2/1.5 days) [23].

In our survey only 10 patients had postoperative complications and 98 had none. This finding is similar to the study done by Poelemeijer YQM, et al., which reported that two procedures (LSG and RGYB) didn't differ in the rate of severe complications [24].

Bariatric surgery is established as a treatment option for people with obesity and Type 2 Diabetes mellitus [DM], with many people experiencing Type 2 diabetes remission postoperatively [25-27]. The first reported clinical trial regarding the effectiveness of bariatric surgery in the treatment of metabolic syndrome was in 2004 [28].

In our study we found there was a good amount of disease improvement as 9 patients decreased the dose of the anti-diabetic drug and 17 of them showed complete cure of disease. In a recent study done by Almalki OM et al, it was reported that RYGB and Single anastomosis gastric bypass (SAGB) was effective in improving metabolic syndromes such as T2D and SAGB had a higher power of on T2D remission than RYGB [29].

Hypertension has long been associated with obesity, and weight loss continues to be a first-line treatment for hypertension. Lifestyle modification and pharmacologic therapy, however, often meet with treatment failure [30]. The findings of our study show that Hypertension was completely cured in 8 patients while 14 of them had to decrease the doses of antihypertensives. The above findings are in accordance with a Meta-analysis done in 2017 which reported that patients who underwent bariatric surgery experienced remission and improvement of their hypertension (63%), T2D (73%) and Hyperlipidemia (65%) [31]. The improvement in these metabolic markers of disease after surgery could be related to a reduction in macrovascular and microvascular events in the body [32].

Another study reported a 50% reduction in microvascular complications in T2D patients after performing bariatric surgery [12]. The actual mechanisms that helps to maintain substantial reduction in BMI could be attributed to variety of factors such as diet restriction as a result of anatomical remodeling of GI tract, hypothalamic modulation involving energy balance and appetite regulation, change in

eating behaviour and patterns, increased diet-induced thermogenesis (DIT) etc. [33-37]. Also it is reported that bariatric surgery involving intestinal diversion and mainly duodenal-jejunal exclusion, have shown reduction in insulin resistance thereby giving a beneficial effect on glucose homeostasis [38].

Limitations

Some of the limitations of our research should be addressed before generalizing the findings. There was a lack of patients who had surgeries other than sleeve gastrectomy. Also, our sample size was not big enough to generalize the satisfaction of the patients. There is a need to do wider research, which should include a larger sample size with more randomization procedures. Current research gives us the impression that bariatric surgery had drastically improved the satisfaction of the patients after surgery both mentally and physically. These types of surgeries should not only focus on reducing weight but also give predominant consideration for body contouring.

Conclusion

Bariatric surgeries are clinical and effective treatment therapies for morbidly obese people. Although the impact of bariatric surgery on mental health is often outweighed by the significant reduction in comorbidities such as T2D and Hypertension, it is important to assess the impact of these surgeries on psychological distress and effect on the quality of life. It is essential to understand what affects the patient's satisfaction in order to understand their behavior or attitudes and optimize our intervention.

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Assessment of the utilization of pharmacotherapy for pediatrics with Autism Spectrum Disorder in Jeddah, KSA

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Abstract

Background: Assessing children with autism and the effect of different modalities in management of autism is a critical issue as the disease is a lifelong disorder that has a negative effect on the social health of the families.

Aim of the work: Evaluate the pharmacotherapy for children with au-tism spectrum disorder in Jeddah.

Method: The current study is a descriptive cross sectional study that was conducted in three private hospitals in Jeddah (KSA); Ibn Sina Hospital, Al Jeddain Gholeel and AlJeddaani AlSafaa. The study included 152 children aged 2-18 years diagnosed with autism according to DSM V criteria. The collected data and the designed questionnaire were filled out by the care giver. Children with concomitant other chronic disease and parents who refused to participate or did not complete the questionnaire were excluded from the study. The collected data were analyzed by SPSS version 20.

Results: The mean age of the children was 4.5±3.2 and the source of the data was mainly from the mother (69.1%). Children were mainly males (75.7%) and the majority of families had only one child with autism (85.5%) and about (45.5%) were diagnosed in the second year of life. The majority of children complained of social withdrawal (85.5%), distraction of attention and repetitive behavior (75%). About (36.2%) of the studied children received combined treatment modalities and the most common pharmacological line used was SSRIs and kebra.

Conclusion: Nowadays management of autism depends on a combination of behavioral management, pharmacotherapy, family and educational therapy for the best outcome. The most common pharmacological line used was SSRIs and kebra and about 75% of children who took drugs complained of side effects.

Key words: Autism, therapeutic, behavior.

Introduction

Autism Spectrum Disorder (ASD) is a neuro-developmental disorder that affects children in the early years of life. It is characterized by lan-guage delay, cognitive, behavior and intellectual impairment and also affects social interaction [1]. Attention deficit hyperactivity disorder (ADHD) and other psychiatric comorbidities like depression, anxiety and behavioral problems are found to be associated with it [2].|

According to DSM-V criteria for diagnosis of (ASD) based on the difficulties in two areas - social communication and restricted, repetitive behavior with difference in ranking of severity [3].

ASD is a complex disorder that reflects the interaction between genetic and environmental factors [4], as many studies revealed a strong genetic hereditability. Hundreds of copy number variants (CNVs) including 16p11.2, 22q11.2, 1q21.1, 7q11.23, and 15q11–q13, have been shown to be strongly associated with it [5], however while genetics is a well-established risk factor it is important to be aware of the contributing environmental factors and other risk factors such as increased maternal and paternal age at time of birth more, than 35 years old, use of hormonal induction and Assisted Reproductive Technologies (ART), exposure to chemical pollutants at critical developmental stages which may affect neural and behavioral development[6] and maternal nutritional status as many micronutrients such as iron contribute to neurotransmitter production, myelination and immune function[7] .

Many studies have demonstrated the prevalence of autism in Saudi Arabia; 42,500 children were diagnosed with autism in 2002, and a study done in 2013 revealed that the prevalence was greater in males than in females [8], however actual prevalence has not been determined up till now as the less-developed child psychiatric services in Saudi Arabia explain the high number of dropped cases [9].

American Academy of Child and Adolescent Psychiatry [10], recommended sets of parameters for best assessment and treatment practices for ASD according to the strength of the underlying clinical state. Psychiatric assessment of young children should routinely include questions about ASD symptomatology; if it indicates significant ASD, diagnostic evaluation should be performed and the clinician should help the family to obtain appropriate structured educational and behavioral interventions for their children with ASD; pharmacotherapy may also be offered to them especially those with comorbid conditions.

The National Institute for Mental Health and Research Units on Pediatric Psychopharmacology assesses the safety and efficacy of pharmacological interventions used in behavioral management of autism, based on pharmaceuticals that has an effect for ameliorating behavioral symptoms with other disorders such as attention deficit hyperactivity disorder (ADHD). They can reduce symptoms such as aggression, irritability and hyperactivity [11].

ASD is a lifelong disorder that has negative effects on the Quality of life (QoL) of parents or caregivers as well as patients. For this reason management of autism is not for eliminating the disorder but improvement of the individual's QoL [12]. Studies have revealed that caregivers of children with different developmental disorders especially ASD were more stressful, tired or exhausted and it impaired their QoL [13].

The aim of this study was to assess aims to evaluate the effect of pharmacotherapy and different therapeutic modalities on the children with autism spectrum disorder and their family in Jeddah.

Patients and methods

Type and site of the study:
Convenient sample of ASD patients was collected from Pediatrics and Psychiatric Clinics in three private hospitals in Jeddah (KSA), Ibn Sina Hospital, AlJeddain Gholeel and AlJeddaani AlSafaa, in a four month duration from July 2019 till October 2019.

Study population:
The study included 152 children diagnosed with autism according to DSM V criteria [3]. The questionnaire was filled out by one of the parents or the care giver.
Inclusion criteria were: children aged 2-18 years diagnosed with autism treated by either drugs only or either combined therapeutic modalities. Children with concomitant other chronic disease and parents who refused to participate or did not complete the questionnaire were excluded from the study.

Data collection:
Upon receiving ethics approval the caregiver of children diagnosed with autism were contacted to participate in a survey by filling out the questionnaire. Basic characteristics were collected including age, sex, and age of diagnosis and the source of information. The care giver was asked about the investigations done and if the child had abnormal EEG, and the received therapeutic modalities.

The questionnaire used was designed to evaluate the effect of different therapeutic modalities (Behavioral, educational and different pharmacotherapy) for the autistic child and family.

The first section: included child basic characteristics (age, gender, age of diagnosis, previous EEG done and any abnormalities) and source of information from the caregiver.

The second section involved the patient's experience of the following symptoms (seizures, anxiety, violence, social withdrawal, repeat behavior, hyperactivity, distraction, sleep disturbance and any abnormalities in cognitive behavior).

The third section included the following items: Drug therapy, Behavioral therapy and Educational therapy (duration of therapy, its effect on the child's behavior and if there was a side effect).

The fourth section included parent awareness and attitude toward having an autistic child.

The questionnaire was translated to Arabic language and a pilot study was carried out (10% of the sample size, 15 subjects) who were excluded from the final analysis, to evaluate the questionnaire in its Arabic version. Feedback was positive and we provided help to participants and aided those facing any difficulty in completing the questionnaire. Validation of the questionnaire was made as follows: the questionnaires were translated using a back-translation technique. An expert translated the original questionnaire from English into Arabic. Arabic version of the questionnaires was translated back into English by a bilingual individual. The back-translated and original versions of the questionnaire were compared with attention given to the meaning and grammar.

Data management:
The collected data were coded, entered, presented, and analyzed by computer using a data base software program, Statistical Package for Social Science (version 20, SPSS Inc., Chicago, IL). Quantitative variables were expressed as the mean ± standard deviation (SD) while the qualitative variables were expressed as a number and percentage.

Ethical considerations:
Ethical approval for the study was obtained from the ethical review committee of the college. The nature of the study was fully explained to the study participants and informed written consent was signed by a care-giver of each child. The study was compliant with the World Medical Association Declaration of Helsinki regarding ethical conduct of research involving human subjects.

Results

This study was a cross sectional study that included 152 children diagnosed with autism. The mean age of the children was 4.5±3.2. The source of the data was mainly from the mother (69.1%) and father (19.7%). Most of the children were males (75.7%) and the majority of families had only one child with autism (85.5%). About (45.5%) were diagnosed in the second year of life. [Table1]

It was noticed that about (69.1%) of parents had previous knowledge about autism and (44.7%) had taken courses about autism. [Table 1]

The majority of children complained of social withdrawal (85.5%), distraction of attention and repetitive behavior (75%). [Table 2]

About (36.2%) of the studied children received combined treatment modalities and the most common pharmacological line used was SSRIs and kebra and about 75% of children who took drugs complained of side effects and the parent either waited for improvement or consulted a doctor. [Table 3]

Regarding different modalities in management of children with autism, it was noticed that about 78.95% reported that their children had started the behavioural therapy and also family therapy since they had been diagnosed and showed no problem with these types of therapy and about 32 of the children out of 76 changed their modalities. [Table 4&6]

While 81 autistic children had received educational therapy, 61.73% of them had started it since they had been diagnosed and 25.93% had problems with this and about 19.75% changed this type of therapy. [Table 5]

Table 1: Basic characteristics of the studied group (n=152)

Characteristics	Value	
Age (years):		
Mean± SD	4.5±3.2	
(minimum-maximum)	(2-10)	
Items	No	%
Source of information:		+
Mother	105	69.1
Father	30	19.7
Others (care giver)	17	11.2
Total	**152**	**100**
Gender of child:		
Male	115	75.7
Female	37	24.3
Total	**152**	**100**
Number of family members with autism		
One	130	85.5
More than one	22	14.5
Total	**152**	**100**
Previous knowledge about autism		
Yes	105	69.1
No	47	30.1
Total	**152**	**100**
Had previous courses about autism		
Yes	68	44.7
No	84	55.3
Total	152	**100**
Age of diagnosis:		
Second year of life	69	45.5
Third year	12	7.9
Fourth year	35	23.0
Fifth year	25	16.4
Sixth to ninth year	11	7.2
Total	**152**	**100**

Table 2: Distribution of different symptoms among the studied group (n=152)

Items	No (n=152)	%
Seizures	60	39.5
Anxiety	76	50
Violence	53	43.9
Social withdrawal	132	85.5
Repetitive behaviour	114	75
Hyperactivity	92	60.5
Distraction	114	75
Sleep disturbance	71	46.7
Cognitive behavior	41	27

Table 3: Distribution of investigation and different treatment modalities among the studied group (n=152)

Items	No (n=152)	%
EEG		
Yes	94	61.8
No	58	38.2
Total	**152**	**100.0**
Abnormal EEG (n=94)		
Yes	32	34.1
No	62	65.9
Total	**94**	**100**
Type of therapy received		
Behavioural therapy	21	13.8
Educational therapy	26	17.1
Family education	25	16.4
Pharmacological therapy	25	16.4
Combined treatment	55	36.2
Total	**152**	**100**
Type of pharmacological treatment		
Buspar	5	6.25
SSRIS	30	37.5
Ritalin	5	6.25
Tegretol	10	12.5
Kebra	20	25
Lithium	5	6.25
Pexidrin	5	6.25
Total	**80**	**100**
Side effects of the drugs		
Yes	60	75
No	20	25
Total	**80**	**100**
Dealing with side effects		
Ignore	8	13.3
Wait for improvement	32	53.4
Doctor consultation	20	33.3
Total	**60**	100
Stop drugs		
Yes	26	32.5
No	54	67.5
Total	**80**	100

Table 4: Distribution of behavioral therapy among the studied group (n=76)

Items	No	%
Start of behavioural therapy		
Since diagnosis	60	78.95
Period after diagnosis	16	20.05
Total	**76**	**100**
Any problems with behavioural therapy (n=76)		
Yes	6	7.89
No	70	92.10
Total	**76**	**100**
Dealing with problems (n=6)		
Ignore	0	0
Wait for improvement	2	33.33
Doctor consultation	4	66.67
Total	**6**	**100**
Stop behavioural therapy		
Yes	5	6.58
No	71	93.42
Total	**76**	**100**
Change modality of therapy		
Yes	32	42.10
No	44	57.9
Total	**76**	**100**

Table 5: Distribution of educational therapy among the studied group (n=81)

Items	No	%
Start of educational therapy (n=81)		
Since diagnosis	50	61.73
Period after diagnosis	31	38.27
Total	**81**	**100**
Any problems with educational therapy (n=81)		
YES	21	25.93
NO	60	74.07
Total	**81**	**100**
Dealing with problems (n=81)		
Ignore	1	4.76
Wait for improvement	18	85.71
Doctor consultation	2	9.52
Total	**21**	**100**
Stop educational therapy (n=81)		
Yes	5	6.17
No	76	93.83
Total	**81**	**100**
Change modality of therapy		
Yes	16	19.75
No	65	80.25
Total	**81**	**100**

Table 6: Distribution of family therapy among the studied group (n=76)

Items	No	%
Start of family therapy		
Since diagnosis	60	78.95
Period after diagnosis	16	21.05
Total	**76**	**100**
Any side effects of family therapy (n=76)		
Yes	8	10.53
No	68	89.47
Total	76	**100**
Dealing with side effects (n=8)		
Ignore	2	25
Wait for improvement	2	25
Doctor consultation	4	50
Total	**8**	**100**
Stop family therapy		
Yes	5	6.6
No	71	93.42
Total	**76**	**100**
Change modality of therapy		
Yes	32	42.10
No	44	57.9
Total	**76**	**100**

Discussion

Autism spectrum disorder is one of the neurodevelopmental disorders that needs very specific and unique care of caregiver or family because it has no specific biological marker and this gives no ideas about the prognosis of this disorder [14].

This was descriptive cross sectional study done on 152 children diag-nosed with autism from three different hospitals. One of the most re-markable finding in this study was that ASD is more common in males than females (75.5% & 24.3% respectively). Also studies done in Stockholm, Sweden stated the distribution of cases of ASD in males and female were 8,033 to 3,297 [15]. One of the theories that explained the decrease in prevalence among females is the presence of female protective effect (FPE) which delays and protects them from some symptoms of autism[16]. However other epidemiological studies supposed the inherited risk factors transmitted to the siblings, showed that the higher rate of ASD siblings is more from the affected female than the affected male. This results in increasing the burden and the rate of sibling ASD recurrence [17].

Diagnosis of ASD in early childhood provides a broad scope in good parent-child relationship which consequently has a great impact in the prognosis of autism[18]; about 45.5% of the studied patients were diagnosed in the first two years however Oswald et al[18] reported that children with ASD were diagnosed at age more than five years old despite early parental concerns but contributed this to late intervention and health care professionals were more likely to explain their concerns as it was too early to tell if anything was wrong.

Systematic review has been done by Spain et al [19], on 24 cross-sectional studies on children diagnosed with ASD; most of them were associated with poor social skills and it showed a link between core diagnosis of ASD and social anxiety. This is found in the present result as more than 85.5% of children had social withdrawal and 75% presented with distraction of attention and repetitive behavior. In a study done in India on 21 children diagnosed with autism, 95.2% of them had little interest in other children and 28.6% presented with repetitive behavior [20].

As seizures affect a high proportion of children with ASD [21], Viscidi et al [22] reported average prevalence of seizures was 12.5% among children with ASD, 2-17 years old. In this study, about 39.5% of ASD children had

seizures and 34.1% had abnormal EEG findings, 37.5% of them received medical treatment (tegretol 12.5% and kebra 25%).

In meta-analysis of randomized, ASD and placebo-controlled trials to assess the efficacy of AED drugs in children diagnosed with autism, from five studies, three studies found no significant difference with placebo while one study showed significant difference in Child Yale-Brown Obsessive Compulsive Scale (CY-BOCS) while the last study showed significant difference regarding irritability, repetitive behavior and agitation [23].

Methylphenidate (Ritalin, Novartis; Concerta, Janssen; and generics) is usually known to be used in Attention Deficit Hyperactive Disorder (ADHD) [24]. In this study 6.25% of the autistic children used Ritalin as 60.5% of the children presented with hyperactivity and 75% with inattention, which are considered the main cardinal symptoms of ADHD. Randomized controlled trials done to assess the effect of methylphenidate on both autistic and ADHD children aged five years old, found improvement in ADHD-like symptoms where hyperactivity as an outcome was rated by both teachers and parents and showed no evidence that it improved social interaction in ASD or worsened symptoms [25].

In the current study the questionnaire used was designed to measure effect of different modalities on the autistic children and their family. One of its domains measured parents as caregivers to a child with autism and expressed some positive aspects (understanding their children, knowing how to help them and working well with therapist); other studies expressed the parents' emotion towards having a child with ASD such as feeling guilty of lack of care, inability to help them and blamed themselves for the inheritance [26].

About 44.7% of the caregivers had previous courses about how to deal with an autistic child. This may be explained by that having a child with a developmental disorder such as autism is a challenge for the family due to the unpredictable behavior that results in increasing levels of stress and also that parents needed both emotional and practical support from the family members and extended family [27].

It was noticed from the previous results that assessing the behavior of children with autism and different therapeutic modalities in addition to their effect on their families is important in determining their needs and their follow up after various interventions, as this will aid in the future care applied to them.

Conclusion

Nowadays management of autism depends on a combination of behavioral management, pharmacotherapy, family and educational therapy for best outcome. The most common pharmacological line used was SSRIs and kebra and about (75%) of children who took drugs complained of side effects.

Recommendation: Further studies are needed with large sample size and screening. A community based study that not only depends on cases taken from hospitals and other interventional programs could be done in future to assess the quality of life of the autistic children's families.

Limitations: The limitations in this study are the small sample size, and needs follow up of the children for the best assessment of behavioral and pharmacotherapy on the autistic child.

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Bladder stone disease in children: clinical study in Aden, Yemen

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Abstract

Background: Bladder stones in children continue to be a serious public health problem in the Middle East.

The aim was to determine the patients' characteristics and some aspects of clinical findings in the affected children.

Materials and method: This was a retrospective study of all children with bladder stones seen and treated at Alsaidi private hospital in Aden, during the period January 2016 to December 2017.

Results: A total of 62 children were diagnosed with bladder stone and (83.9%) were males and (16.1%) females. Their age ranged between 1 to 12 years. The age group 1 to 6 years represented the highest percentage of patients (53.2%)

Most patients were from rural areas (69.4%). The ratio male to female was 5.2:1 and the mean age of all patients was 6.3±3.5 years (age range between 1 to 12 years). The mean size of stones was 14.8±3.9 mm (stone size range 8 – 20 mm).

The symptoms were dysuria (40.3%), urine retention (32.3%), and hematuria (27.4%). Urinary tract infection was in (24.2%) patients. The treatment procedures were (53.2%) managed by cystolitholapaxy followed by cystolithotomy (46.8%).

The relationship between bladder stone size groups and the treatment procedures was statistically significant (p = 0.000).

Conclusion: The majority of affected children were males and were from rural areas. Also, the majority were less than 6 years old. The treatment procedures were cystolitholapaxy followed by cystolithotomy.

Key words: Bladder stone, children, Aden, Yemen

Introduction

The oldest bladder stone found by archaeologists'- dates back to 4800 BC in Egypt [1]. Currently, bladder calculi are uncommon cause of pediatric illness in Western nations. Bladder calculi remain common in less developed countries [2].

Urinary calculi can be broadly divided into two types, namely upper urinary tract calculi and lower urinary tract calculi. Bladder calculi are the most common lower urinary tract calculi [3].

Bladder calculi account for 5% of urolithiasis and usually result from the diet, foreign bodies, bladder outlet obstruction, or urinary tract infection [3].

Bladder calculi can be classified into the following two types: primary bladder calculi and secondary bladder calculi [4].

Primary bladder calculi are more common in children exposed to low-protein or low-phosphate diets. Primary bladder calculi have a low recurrence rate following completion of treatment [5].

The following four causes may lead to secondary bladder calculi formation: (i) bladder outlet obstruction, (ii) intravesical foreign bodies, (iii) neurogenic bladder and spinal cord injury, and (iv) renal transplant [4].

Bladder calculi in children in the absence of obstruction, infection or neurogenic disease are considered to be endemic [6].

However, bladder calculi continues to be a serious public health problem in resource poor settings notably in the Middle East, Africa and South East Asia the so called Afro-Asian stone belt [7,8].

The symptoms and findings in children with bladder stones are usually urgency, frequency, incontinence, dysuria, pyuria, difficulty voiding, small caliber of urinary stream, lower abdominal pain and urinary intermittency, with fever reported in about 20-50% of these children [9]. Additionally macroscopic hematuria in children with bladder stones has been noted in 33-90% of patients [10,11]. Most bladder stones are composed of calcium oxalate (45-65%), followed by calcium phosphate (14-30%), and they are usually larger than 2.5 cm in diameter [12,13].

The aim of this study was to determine the patients' characteristics and some aspects of clinical findings in children with bladder stone disease.

Materials and method

This was a retrospective study of all children who suffer from bladder stones and who were seen and treated at Alsaidi private hospital in Aden over a two-years-period, from January 2016 to December 2017. During this period, a total of 62 patients were found with this health problem. The patients' charts were retrieved and information was obtained about sex, age, residency, family history, size of stone, symptoms, urinary tract infection and treatment procedures.

The data was entered into a computer and analyzed using SPSS version 17, statistical package. For variables difference, chi-square tests, means and P values were calculated, with differences at the level less than 5% regarded as significant.

Results

In the study years 2016 to 2017, a total of 62 children were diagnosed with bladder stone disease according to their medical records. Table 1 and Figure 1 revealed that males were 52 (83.9%) and females 10 (16.1%).

The age of patients ranged between 1 to 12 years.

The age group 1 to 6 years represents the highest percentage of patients 33 (53.2%) while the age group 7 to 12 years was 29 (46.8%).

Most of patients were from rural areas 43 (69.4%). Family history of urinary stones was found in 10 (16.1%).

Table 1: Characteristics of the study patients (n=62)

Variables	No	(%)
Sex:		
Males	52	(83.9)
Females	10	(16.1)
Age group (years):		
1 – 6	33	(53.2)
7 – 12	29	(46.8)
Residency:		
Rural	43	(69.4)
Urban	19	(30.6)
Family history:		
Yes	10	(16.1)
No	52	(83.9)

Figure 1: Distribution of patients related to sex

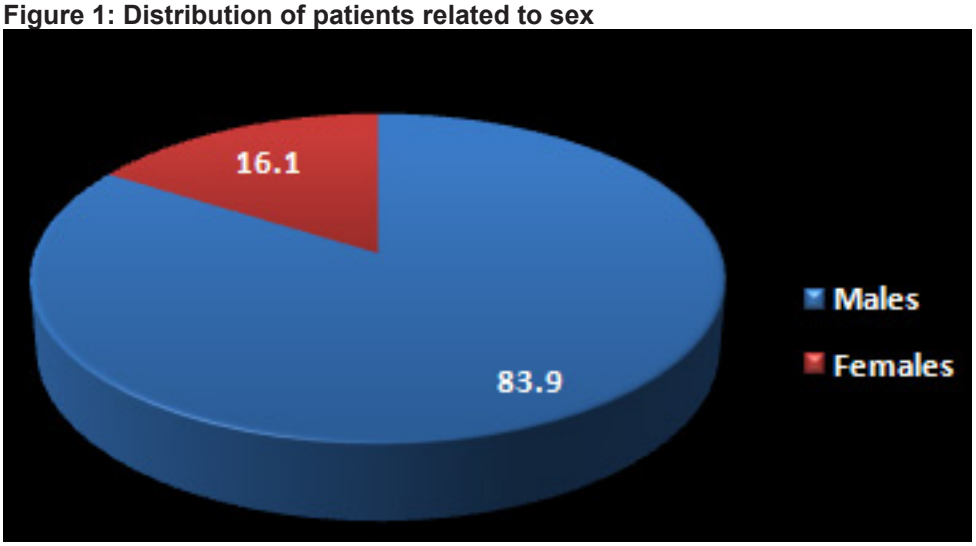

Table 2 showed the ratio male to female was 5.2:1. The mean age of all patients was 6.3±3.5 years. The mean age of males was 6.4±3.5 years and the mean age of the female patients was 5.7±3.4 years. There is no association between means (p > 0.05). The age of all patients ranged between 1 to 12 years. The mean size of stones was 14.8±3.9 mm and the stone size range was 8 – 20 mm. There is no association between means of stone sizes (p > 0.05).

Table 2: Distribution of mean age & mean size of bladder stones related to sex

Characteristic	Range	Ratio	Mean ± SD	p- value
Ratio male to female		5.2 : 1		
Mean age (years)				
Males			6.4 ± 3.5	P >
Females			5.7 ± 3.4	0.05
Total			6.3 ± 3.5	
Age range (years):	1 – 12			
Mean size of stones (mm):				
In males			14.4 ± 4.0	P >
In females			16.9 ± 2.0	0.05
Total			14.8 ± 3.9	
Range of stone size (mm):	8 – 20			

Table 3 revealed that the symptoms were dysuria in 25 patients (40.3%), followed by urine retention in 20 (32.3%), and hematuria in 17 patients (27.4%).

The sizes of stones were put into two groups. Group 8 – 13 mm was 22 (35.5%) while group 14 – 20 mm was 40 (64.5%). Fifteen (24.2%) were found with urinary tract infection. Thirty three (53.2%) of the patients admitted with bladder stone were managed by cystolitholapaxy followed by cystolithotomy 29 (46.8%) as shown in Table 3.

Table 3: Clinical characteristics and management (n=62)

Variables	No	(%)
Symptoms:		
Dysuria	25	(40.3)
Urine retention	20	(32.3)
Hematuria	17	(27.4)
Size group (mm):		
8 - 13	22	(35.5)
14 - 20	40	(64.5)
Urinary Tract Infection:		
Yes	15	(24.2)
No	47	(75.8)
Treatment:		
Cystolitholapaxy	33	(53.2)
Cystolithotomy	29	(46.8)

The relationship between bladder stone size groups and the treatment procedures was statistically significant (p = 0.000) while the difference between values of symptoms and treatment procedures was not significant (p > 0.05) as shown in Table 4.

Table 4: Relationship between treatment and clinical findings (n=62)

Variables	Treatment type				p-value
	Cystolithotomy		Cystolitholapaxy		
	No	(%)	No	(%)	
Stone size group (mm):					
8 – 13	0	(0.0)	22	(35.5)	p=0.000
14 – 20	29	(46.8)	11	(17.7)	
Symptoms:					
Dysuria	10	(16.1)	15	(24.2)	P > 0.05
Urine retention	12	(19.4)	8	(12.9)	
Hematuria	7	(11.3)	10	(16.1)	

Discussion

Bladder stones in developing nations are more commonly endemic in children because of dehydration, infection and a low-protein diet. Calcium-based stones in Western countries are relatively rare in the upper tract [14]. Bladder stones are usually rounded and may occur as singles or multiples. They can be small, or can be large enough to occupy the entire bladder. Bladder stones reach up to 5 cm in diameter in some parts of Asia [15].

In the present study we found 62 children were diagnosed with bladder stone disease and males were significantly more affected than females; they were 52 (83.9%) males and 10 (16.1%) females with the ratio male to female 5.2:1.

In a study that was conducted in Pakistan [16], males were more affected than female children. In their study, out of 113 children with bladder stones males were 97 (85.8%) and females were 16 (14.15%) with M: F ratio of 6:1.

Huffman et al [17] reported that childhood bladder stones are more common in boys than girls.

Our findings correlate well with Huffman et al [17] and Lal et al [16] that in areas of endemic bladder stones boys are affected more than girls.

In our study the age group 1 to 6 years represents the highest percentage of children (53.2%) with childhood bladder stones.

Lal [16] reported that in their study 67% of children affected with bladder stones were less than 5 year of age.
We found in our study that most of the patients are from rural areas (69.4%).

Husain M et al [18] reported in their study that the geographical distribution of paediatric bladder stone is in a transition phase in this country. The children from affluent areas of the city have decreased incidence but disease continues to be endemic in rural areas of the country and poor localities of big cities. Lal et al [16] reported in their

study that 98% of children are from rural populations of poor socioeconomic group and 2% from urban cities/ town's population of Tharparker, Pakistan.

Bladder stones are still prevalent in children living in poor or rural regions [19,20,21].

Our study showed that positive family history of urinary stones was found in 10(16.1%).

Positive family history has been reported to be present in 17–37% of patients with stone disease when compared with 4–22% of normal healthy control subjects [22]. In a well-designed epidemiological study, about 25% of patients with urinary stones were found to be associated with a positive family history [23]. In another study, it was demonstrated that stone-forming patients with positive family history were affected by the disease at younger ages [24].

In the present study, common symptoms at presentation were dysuria in 25 patients (40.3%), followed by urine retention in 20 patients (32.3%), and hematuria in 17 patients (27.4%. These findings are comparable to other similar studies in the literature [25,26,27].

In our study the mean age of all patients was 6.3±3.5 years. The mean age of males was 6.4±3.5 years and the mean age of the female patients was 5.7±3.4 years. There is no association between means ($p > 0.05$). The age of all patients ranged between 1 to 12 years.

Lal et al [16] reported in their study that the age of their study children ranged from 18 months to 14 years which is more than ours also, with the mean age 8.6±4.9 years higher than our study patients'- mean age.

Similar to our findings Ali et al [25] reported in their study that out of 120 patients, 90 (75%) were males and 30 (25%) were females. The mean age of the patients was 6.2+2.03 years, with age ranging from 3-13 years.

In the current study we found the mean size of the stones was 14.8±3.9 mm and the stone size range was 8 – 20 mm.

Also, we found that the bladder stones of the group size 14 – 20 mm represented the higher percentage (64.5%).

This is comparable to what Ali et al [25] reported, that the mean stone size on ultrasonography was 14.1+3.30 mm, with size ranging from 6-22 mm.

In the present study we found (53.2%) of the patients admitted with bladder stone were managed by cystolitholapaxy followed by cystolithotomy (46.8%).
Cystolitholapaxy and lithotripsy have now become the gold standards for the treatment of bladder stones. Most published studies have used a holmium laser, electrohydraulic lithotripter, and Litho Clast technology for the treatment of all types of bladder stones in both the adult and pediatric populations [28].

Open cystolithotomy was previously the gold standard before the introduction of endoscopic technology for the treatment of bladder stones in pediatric patients for a long time offering excellent success rates [28]. Abarchi et al [29] obtained 100% of patients free of calculi in a series of 70 children with bladder stones.

The development of smaller equipment, associated with increased experience of endourologists with minimally invasive procedures, has led to more endoscopic approaches to bladder stones in pediatric patients. If in adults there are no good prospective studies, in children the situation is no different [30].

Salah et al [31] percutaneously approached 155 children younger than 14 years old with calculi measuring between 7 and 40 mm (mean 23 mm). All patients were free of calculi without major complications.

Al-Marhoon et al [32] compared endourologic procedures with open cystolithotomy in children with an average age of five (2-15 years) and bladder calculus of average size 2.8 cm (0.7 to 5.0 cm). Fifty-three patients were treated by open cystolithotomy and 54 patients by transurethral or percutaneous access.

Yu et al [33] reported that in Taiwan, only 5% of inpatients with urolithiasis underwent open surgery for lithotomy. Transurethral cystolitholapaxy and lithotripsy have now become the gold standards for the treatment of bladder stones.

We found in our study that the relationship between bladder stone size groups and the treatment procedures was statistically significant ($p = 0.000$) while the difference between values of symptoms and treatment procedures was not significant ($p > 0.05$).

Conclusion

We concluded that childhood bladder stones represented a public health problem in Yemen. The majority of affected children were males and were from rural areas. Also, the majority of them were less than 6 years old.

Most affected patients had bladder stone sizes more than 14 mm. The treatment procedures were cystolitholapaxy followed by cystolithotomy.

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Risk factors of clinical types of Acute Coronary Syndrome

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Abstract

Objective: to explore clinical patterns and risk factors of Acute Coronary Syndrome (ACS).

Results: A great proportion of the patients with ACS had an age range of 46 – 59 years (47.3%), and 28.2% were younger than 46 years old. Among the cases of ACS, S-T elevation myocardial infarction (STEMI) were 23.7%, non- S-T elevation myocardial infarction (NSTEMI) were 29.5% and unstable angina (UA) were 46.8%. Chest pain (82.7%), and shortness of breath (24.7%) were the most common complaints among patients with ACS. Sweating was encountered among 9.7% of the patients. Risk factors for ACS included smoking (OR:8.95;95% CI:4.022, 19.914, and $p < 0.000$), and male gender (OR:0.414;95% CI:0.190, 0.902, and $p < 0.026$). STEMI was significantly associated with increased mean values of Na level (mean 142.1mEq/L), and young age (mean 48.5 years). NSTEMI was associated with increased value of random sugar level (mean 201.1 mg/dL). UA was associated with increased mean values of systolic and diastolic blood pressures (means 155, and 94 mmHg respectively) and increased Uric acid level (6 mg/dL). In agreement with a recent study, the present study didn't find hypercholesterolemia as a significant risk factor for ACS after allowing for possible risk factors.

Key words: Acute Coronary Syndrome, risk factors, Saudi Arabia

Introduction

Cardiovascular Diseases (CVD) are the leading cause of morbidity and mortality worldwide. (1) Coronary artery disease (CAD) is the most common CVD and accounts for morbidity and mortality of millions all over the world. Acute coronary syndrome (ACS) represents a major health problem mainly among middle aged and elderly populations, although it also affects younger age groups and imposes marked limitations on their life style (2-4). Urbanization in most of the countries has resulted in increased obesity and smoking habit, and development of diabetes mellitus, dyslipidemia, and hypertension, which provide risk factors for rising occurrence of CAD (5, 6). Saudi Arabia, with the major transformation and adoption of a western life style, has suffered from increased prevalence of risk factors for CVD. (6, 7). Among the concern of the 2030 vision of Saudi Arabia is to promote the health care systems through scrutinizing risk factors for the main health problems to deliver community based preventive measures and improve access to health care systems. Our objectives include identifying the pattern of clinical presentation, and exploring the risk factors of the different clinical types of ACS.

Method

A cross sectional study was conducted where the files of 186 patients with ACS admitted to the cardiac wards of two general hospitals: one in the North of Jeddah city and one in the southern region were reviewed during the period 2017-2018. The diagnosis of ACS was based on patient's history of chest pain, physical examination, electrocardiography, radiologic tests, and serial high sensitivity Troponins. ACS was further categorized into unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI) (8). Data regarding the underlying risk factors such as a positive family history, smoking, hypertension, fasting lipid profile for dyslipidemia, liver and kidney profile, random and fasting glycemic profile and uric acid levels were obtained. Demographic characteristics, complications and outcome were also revised. Patients with congenital or valvular heart disease were excluded. A number of 195 inpatients at the same hospitals, without current or past ACS, and who were admitted for causes other than cardiac diseases were employed as controls.

Statistical analysis: Data was analyzed using SPSS (IBM P/C version 23). The Multi-nominal Logistic regression was used; Odds ratio and 95% confidence intervals for the different risk factors were calculated. Level of significance for this study was 0.05.

Results

The majority of patients with ACS were 46 – 59 years old (47.3%); 28.2% were younger than 46 years old, while 24.2% were older than 59 years. The percentage of males among ACS patients [159 (85.5%)] was greater than that of females [27 (14.3%)]; and about one third of the patients with ACS were current smokers [62 (33.3%)]. These findings were significantly higher among patients with ACS compared to controls ($p < 0.000$). Among patients with ACS: 32.3% had treatment for diabetes mellitus, 45.2% had treatment for hypertension and 15.1% had treatment for ischemic heart disease. However these differences were not significantly different from those of the control group ($p > 0.05$). Among the cases of ACS, STEMI was 23.7%, NSTEMI was 29.5%, and UA was 46.8%. Table 1 shows that smoking subjects are 9 times more likely to suffer from ACS (OR: 8.95; 95%CI: 4.022, 19.914, and $p < 0.000$) compared to non-smoking subjects, after allowing for other risk factors. Male subjects are 2.14 times more likely to suffer from ACS (OR: 0.414; 95%CI: 0.190, .0902, and $p < 0.026$) compared with females after allowing for other risk factors. Subjects with hypertension are 1.8 times more likely to suffer from ACS (OR: 0.546; 95%CI: 0.296, 1.007, and $p < 0.053$) compared with normal subjects. Subjects with Diabetes mellitus are 1.726 times more likely to suffer from ACS (OR: 1.726; 95%CI: 0.886, 3.360) compared with normal subjects; however this difference was not statistically significant ($p < 0.108$). Dyslipidemia was irrelevant to ACS, when other factors were controlled.

Table 2 shows that the males were more encountered among the ACS patients with STEMI or NESTMI, while the females were more encountered among the ACS cases with UA ($p < 0.05$). Smoking habit was more common among the patients with STEMI (47.7%) and NSTEMI (43.6%) compared to those with UA(21.8%). These differences were statistically significant ($p<0.05$). Cases with STEMI (43.2%) and with NSTEMI (40.0%) had treatment for DM significantly more than the patients with UA(21.8%). No significant differences were found between the three groups regarding treatment for hypertension or ischemic heart disease (IHD) where $p<0.05$.

Table 3 shows that STEMI was significantly associated with increased mean values of Na level compared to NSTEMI and UA (142.1mEq/L, 139.11mEq/L, and 140.21mEq/L respectively). STEMI was significantly associated with young age (mean =48.5 years), compared to NSTEMI, and UA (54.3, and 52.5 respectively). NSTEMI was associated with increased value of random sugar level (201.1 mg/dL), Compared with STEMI and UA, UA was associated with increased mean values of systolic and diastolic blood pressures (155, and 94 mmHg respectively) and increased Uric acid level (6 mg/dL), compared to STEMI and NSTEMI.

Table 4 shows that chest pain was the most common complaint among patients with ACS (81.7%) particularly among those with STEMI (97%). Dyspnea was a presenting complaint in 24.7% of the patients with ACS, particularly those with UA (29%). Palpitation and headache were complaints among 7.5% of patients with ACS, mainly among those with UA (12.6% and 13.8% respectively).

Table 1: Multi-nominal logistic regression of different risk factors and ACS

Independent Variables	B	P- Value	Exp (B)	95% Confidence Interval for Exp (B)	
				Lower Bound	Upper Bound
Intercept	-.050-	.978			
Age (years)	-.011-	.394	.989	.965	1.014
Hypercholesterolemia	.000	.930	1.000	.997	1.003
Hypertriglyceridemia	.000	.878	1.000	.995	1.006
Smoking habit (1= no, 2=yes)	2.192	.000	8.950	4.022	19.914
Gender (1= male, 2= female)	-.881-	.026	.414	.190	.902
Area of residence (1= Ghulail, 2= El-Safa)	-.240-	.852	.787	.063	9.823
Having DM (1= No, 2= Yes)	.546	.108	1.726	.886	3.360
Having HTN (1= No, 2= Yes)	-.605-	.053	.546	.296	1.007
Having IHD (1= No, 2= Yes)	-.308-	.423	.735	.347	1.560

Table 2: Types of ACS and personal and medical disorders

Variables	ACS			X2 (p)
	STEMI (number 44)	NSTEMI (number 55)	USA (number 87)	
Gender				
Male	93.2%	90.9%	78.2%	7.1
Female	6.8%	9.1%	21.8%	(< 0.021)
Smoking				14.17
Yes	47.7%	43.6%	19.5%	(< 0.001)
DM				8.2
Yes	43.2%	40.0%	21.8%	(<0.016)
Hypertension				0.43
Yes	47.7%	41.8%	46.0%	(<0.821)
IHD				0.81
Yes	11.4%	14.5%	17.2%	(0.669)

Table 3: Analysis of variance for the blood chemistry and age among different types of ACS

Age and Blood chemistry		Mean	Std. Deviation	95% Confidence Interval for Mean		F-Ratio (*P*)
				Lower Bound	Upper Bound	
Cholesterol	STEMI	212.9259	47.53616	194.1212	231.7306	
	NSTEMI	191.7727	57.68877	174.2337	209.3117	2.933
	UA	185.1739	46.69864	173.9557	196.3922	(<0.057)
	Total	192.6000	51.25319	184.0355	201.1645	
Systolic BP	STEMI	133.5814	25.56619	125.7133	141.4495	
	NSTEMI	144.8077	35.67228	134.8765	154.7389	6.644
	UA	155.4070	33.61595	148.1997	162.6143	(<0.002)
	Total	147.1768	33.53840	142.2577	152.0958	
Diastolic BP	STEMI	82.0465	15.13110	77.3898	86.7032	
	NSTEMI	89.6731	23.83910	83.0362	96.3099	6.003
	UA	94.3837	17.58420	90.6137	98.1538	(0.003)
	Total	90.0994	19.61550	87.2225	92.9764	
Na	STEMI	142.0741	3.12467	140.8380	143.3102	
	NSTEMI	139.2059	4.82907	137.5209	140.8908	6.937
	UA	141.9516	3.20567	141.1375	142.7657	(<0.003)
	Total	141.2195	3.88468	140.5261	141.9129	
URIC ACID	STEMI	4.9513	1.37880	4.3551	5.5475	
	NSTEMI	5.9909	1.99270	5.2843	6.6975	3.949
	UA	6.0434	1.46570	5.6394	6.4474	(<0.022)
	Total	5.7971	1.67085	5.4798	6.1143	
RBS	STEMI	190.6400	97.25734	150.4941	230.7859	
	NSTEMI	207.1457	129.85123	162.5403	251.7512	4.303
	UA	145.4681	66.63262	125.9040	165.0322	(<0.016)
	Total	176.1972	101.29615	156.7823	195.6121	
Age	STEMI	48.5000	9.82995	45.5114	51.4886	
	NSTEMI	54.3091	12.28952	50.9868	57.6314	3.326
	UA	52.5862	11.47449	50.1407	55.0318	(<0.038)
	Total	52.1290	11.50626	50.4646	53.7935	

Table 4: Presenting symptoms among patients with different forms of ACS

Symptoms	Acute coronary syndrome (Number 186)						X² (*P*- Value)
	STEMI (Number= 44)		NSTEMI (Number= 55)		UA (Number= 87)		
	No	%	No	%	No	%	
Dyspnea	7	15.9%	14	25.5%	25	28.7%	2.65 (0.272)
Orthopnea	0	0.0%	2	3.6%	3	3.4%	1.59 (0.450)
Chest pain	43	97.7%	45	81.8%	64	73.6%	11.42 (0.003)
Palpitation	0	0.0%	3	5.5%	11	12.6%	7.19 (0.027)
Cough	1	2.3%	1	1.8%	1	1.1%	0.25 (0.881)
Headache	0	0.0%	2	3.6%	12	13.8%	9.7 (0.008)
Vertigo	0	0.0%	0	0.0%	3	3.4%	3.4 (0.176)
Dizziness	1	2.3%	1	1.8%	7	8.0%	3.7 (0.160)
Sense of death	1	2.3%	1	1.8%	2	2.3%	0.04 (0.980)
Sweating	7	15.9%	6	10.9%	5	5.7%	3.5 (0.166)
Nausea	2	4.5%	2	3.6%	4	4.6%	0.08 (0.959)
Vomiting	2	4.5%	0	0.0%	0	0.0%	6.52 (0.038)
Restless	24	54.5%	25	45.5%	38	43.7%	1.44 (0.487)

Discussion

ACS encircles a wide range of clinical disorders that are shared by more than one physiologic derangement: an acute or sub-acute imbalance between the oxygen demand and supply of the myocardium. ACS includes UA and evolving MI which is usually divided into STEMI and NSTEMI. (5). Each year in the United States of America, approximately 1.36 million hospitalizations are required for ACS (9). The prevalence of ACS in the Middle East differs from one country to another. For instance, it was 6% in Saudi Arabia (in 2004), 8.3% in Egypt (in 2001) and 13% in Lebanon (in 2008). However, by 2030, this prevalence is expected to rise due to increasing rates of hypertension, DM, overweight, obesity, physical inactivity, smoking and dyslipidemia (10) Premature ACS remains a significant cause of morbidity and mortality worldwide. In 2012, CAD was the cause of death in 1894 Canadians younger than 55 years. Further, ACS remains a significant cause of lost work productivity, unemployment, and disability in this young age category (11). In this study, 28.2% were under the age of 46. This is in line with another study (12). Several previous reports have revealed the existence of gender differences in terms of presentation of symptoms, validity of diagnostic tests, in-hospital medication, drug side effects, clinical outcomes, complications, and management of ACS(13-16). The percentage of women diagnosed with ACS can range from 33% to 45% (17). This is in line with findings from the present study where the percentage of males was 85.5% while that of females was 14.3%; in addition male subjects were 2.14 times more likely to suffer from ACS compared with females. These sex differences in occurrence of ACS, might be explained by differences in anatomic, physiologic, biologic, and psychological characteristics among them(14, 18). In the present study smoking subjects were 9 times more likely to suffer from ACS (OR: 8.95; 95%CI: 4.022, 19.914, and p < 0.000) compared to non-smoking subjects, after allowing for other risk factors. Smoking is regarded as a strong risk factor for myocardial infarction. Numbers of studies have shown a strong positive correlation between atherosclerosis, smoking and myocardial infarction. Smoking leads to premature atherosclerosis and cardiac death. One in every 5 deaths in the United States each year is due to cigarette smoking. Risk is more in women who smoke and who are taking birth control pills (19-22). Chest pain was the most common complaint among patients with ACS (81.7%) particularly among those with STEMI (97%). Dyspnea was a presenting complaint in 24.7% of the patients with ACS, particularly those with UA (29%). Palpitation and headache were complaints among 7.5% of patients with ACS, mainly among those with UA (12.6% and 13.8% respectively). This is in line with other studies (23-26). The risk factors for coronary artery disease (CAD) include hypercholesterolemia, hypertension, and diabetes mellitus (DM). (9, 10). In the present study, when multivariate logistic regression was used to allow for different factors, diabetes mellitus, hypertension and dyslipidemia were not significant risk factors for ACS.

Ralapanawa et al in 2014 reported 25.7% ACS in Sri lanka to be STEMI, 36.7% to be NSTEMI, and 37.7% to be UA (23). Hersi et al.in 2007 reported 41.5% ACS in Saudi Arabia to be STEMI, 36.5% to be NSTEMI, and 22.1% to be UA (24); while our study in 2018 showed 23.7% of ACS to be STEMI, 29.5% to be NSTEMI and 46.8% UA.

Medagama et al, showed no significant difference in age distribution of patients with all groups of ACS, with the majority being between 51 and 70 years of age.(25) Sharma et al showed a higher mean age of 60.07 ± 10.47 years amongst NSTEMI patients compared to 57.76 ± 11.44 years for STEMI patients with no significant statistical difference. (26). Ralapanawa et al, showed a slightly higher mean age

for UA (62.2 years) and NSTEMI (61.9 years) compared to STEMI (59.2 years) but without a statistical significance (P = 0.246) (22). In line with these findings we found that mean age for STEMI (48.8 ±9.8 years) was significantly lower than the mean age for NSTEMI (54.3 ± 11.4 years) and mean age for UA (52.5 ± 11.47 years). In the present study we found that patients with STEMI and NSTEMI were more commonly males , smokers and having DM compared to the patients with UA; on the other hand females were significantly more encountered among the patients with UA.

Treatment for hypertension and IHD was similar in all groups with ACS. The patients with NSTEMI had increased value of random sugar level compared with the patients with STEMI and UA. These are in line with previous studies (23-26). Hyponatremia, defined as a serum sodium concentration ([Na+]) <135 mmol/L, is the commonest electrolyte disorder encountered in clinical practice. Previous studies had found that hyponatremia is closely related to the prognosis of heart failure (26), and stroke (27). In the present study we found that the patients with NSTEMI and UA had significantly decreased mean value of Na level compared to the patients with STEMI. The underlying mechanism may be relevant to the release of vasopressin, activation of the renin-angiotensin system and catecholamine production (28, 29). Recent epidemiological and clinical evidence suggests that hyperuricemia might be a risk factor for cardiovascular disease where enhanced oxidative stress plays an important pathophysiological role (30). It has been recently reported that serum uric acid is an independent predictor of mortality for patients with CAD and morbidity, including acute myocardial infarction or congestive heart failure (31). In the present study we found the patients with UA had increased Uric acid level compared to the patients with STEMI and NSTEMI.

Conclusion

Male gender, smoking and hypertension were significant risk factors for occurrence of ACS. The occurrence and effect of risk factors differed by type of ACS. Male gender, smoking, DM, and young age were significantly associated with STEMI. Old age, smoking DM, high RBS, and decreased Na+ level, were significantly associated with NSTEMI. Female gender, increased mean value of uric acid, systolic and diastolic blood pressures were significantly associated with UA. Patients with dyslipidemia do not have a preponderance for any type of ACS. More studies are required to understand epidemiology, presentation and risk factors of ACS particularly in regional levels as they can differ from one region to the other. This understanding would help to implement preventive measures including lifestyle modification and drug treatment optimizing risk factors.

Limitations of this study

It was based on a convenient sample. Some data were missing from files of the patients like family history and exercise activities. However, our results were very close to studies conducted in Saudi Arabia and in other parts of the world.

List of abbreviations

ACS: Acute coronary syndrome
STEMI: S-T elevation myocardial infarction
NSTEMI: Non-ST elevation myocardial infarction
UA: Unstable angina
CAD: Coronary artery disease
IHD: Ischemic heart disease
DM: diabetes mellitus
SPSS: Statistical package for Social Sciences
Od: Odds Ratio
CI: Confidence interval

Declarations

Ethics approval and consent to participate
Ethical clearance was obtained from the institutional review board (Protocol identifier 006MP25082019; Application of human ethics committee approval -2-, 17/12/2016). Permission was obtained from the directors of the outpatient clinics for collecting data from the records. Data collection procedure was anonymous.

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Cisplatin induced mesenteric ischemia

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Abstract

Background: Cisplatin is a platinum-based chemotherapeutic agent with wide complications including life-threatening acceleration of venous and arterial thrombosis. Cisplatin associated thrombosis occurs through triggering platelet activation.

Objectives: The aim of this study is to present a case of non-keratinizing undifferentiated nasopharyngeal cancer who had cisplatin chemotherapy.

Methods: We present a 56 year old male admitted to Al-Hada emergency department complaining of diffuse severe abdominal pain associated with nausea at the onset of the pain and constipation one day ago. He was diagnosed with non-keratinizing undifferentiated nasopharyngeal cancer and started chemotherapy of 2 doses of Cisplatin and 12 doses radiotherapy.

Results: On abdominal examination there was generalized guarding and tenderness and the abdomen was distended. There was no organomegaly, bowel sound was scanty, and empty rectum in digital examination. Abdominal X-ray revealed distended small bowel and no air fluid level. There was sinus rhythm on ECG. His WBC count was 19 x 10 3/ µL, and lactic acid level was 9.6 mmol/L. Abdominal contrast enhancement computed tomography showed a large filling defect at the proximal part of the superior mesenteric artery with dilated bowel and porto-mesenteric gas pneumatosis intestinalis. The filling defect seen was obliterating the superior mesenteric artery's lumen denoting acute arterial obstruction distally to its terminal branches. Exploration laparotomy showed heavily necrotic bowel from 30 cm distal to duodenojejunal junction down to 50cm proximal to ileocecal valve, with an area of engorged bowel proximal to that (~ 50 cm, more toward ischemic). After immediate resuscitation with D5 normal saline and intravenous ceftriaxone the patient became oliguric and tachycardic. The patient was admitted to the ICU and labelled as Do-Not-Resuscitate (DNR) and arrested after 6 hours.

Conclusion: In this study, thromboembolic events (TEEs) occurred within the first 100 days of starting cisplatin. TEE prophylaxis is advisable for patients receiving cisplatin-based chemotherapy.

Key words: Cisplatin, induced, mesenteric, ischemia, Hada, Saudi Arabia

Introduction

Cisplatin is a platinum-based chemotherapeutic agent that was licensed in 1978 and is now listed on the World Health Organization's list of essential medicines. It is widely used, alone or in combination, to treat several cancers, including testicular, ovarian, cervical, bladder, head and neck, lung, esophageal and gastric cancers (1,2). It acts by crosslinking purine buildups preventing cell division and expanding oxidative pressure actuating apoptosis (3).

Cisplatin has known complications like nausea and vomiting, nephrotoxicity, hepatotoxicity, cardiotoxicity, myelosuppression, and hypersensitive responses (4). But common life-threatening side effects of cisplatin, which can occur in up to 18.1% of patients during or shortly after treatment is the acceleration of venous and arterial thrombosis (5).

Many hypotheses exist pertaining to the mechanisms associated with Cisplatin associated thrombosis including direct damage to the vascular endothelium, increased procoagulant activity, reduced anticoagulation synthesis, platelet activation and aggregation and vascular inflammation (6,7).

Khorana risk score is used to predicate risk of thrombosis in cancer patients (8). Khorana risk score was used in studies as predictor of thromboembolic events (TEEs) in patients treated with cisplatin based chemotherapy with other predictors like underlying primary malignancy, stage of disease, age, Karnofsky performance status (KPS), and presence of central venous catheter and were significant by multivariate analysis (9).

Thromboprophylaxis for patients treated with cisplatin-based chemotherapy is not included in any guideline but recent studies recommend it if there is no contraindication (10).

Case presentation

History of present illness

After 3 days of last chemotherapy 56 years old male self-presented to Al-Hada emergency department and complained of diffuse severe abdominal pain. The pain started suddenly one day ago, and was progressive, diffuse (mainly epigastric), no radiation, no aggravating or relieving factor. The pain was associated with nausea at the onset of the pain and constipation one day ago, with no history of vomiting, and bleeding per rectum.

On his past medical history, he was a known case of DM, HTN. He was diagnosed 3 weeks ago with non-keratinizing undifferentiated nasopharyngeal cancer and started chemotherapy (received 2 doses of Cisplatin and 12 doses of radiotherapy). Social history revealed that he was a lifelong nonsmoker, and had no history of alcohol consumption.

The patient was alert and hemodynamically stable but subjectively unwell. On abdominal examination there was generalized guarding and tenderness and the abdomen was distended. There was no organomegaly, bowel sound was scanty, and empty rectum on digital examination. An erect chest X-ray was done and there was no pneumoperitoneum. And abdominal X-ray revealed distended small bowel and no air fluid level. There was sinus rhythm on ECG.

Findings of patient's blood analysis

Parameter	value	Normal range	Parameter	value	Normal range
Hemoglobin (g/dl)	16.9	13.0-18.0	Amylase (U/L)	82	25-125
Leucocyte count (x10-3/uL)	19.3	4.00-11.00	Alkaline phosphatase (U/L)	56	40-150
Platelet (x10-3/uL)	265	150-410	Bilirubin (umol/L)	24.4	0.0-20.5
Serum creatinine (umol/L)	85	62-115	Aspartate transaminase (U/L)	24	5-34
Serum potassium (mmol/L)	4.0	3.5-5.1	Serum calcium (mmol/L)	1.99	2.10-2.55
Serum sodium (mmol/L)	138	135-145	Serum magnesium (mmol/L)	0.60	0.66-1.07
C–reactive protein (mg/L)	147.7	0.0-5.0	Activated partial thromboplastin time (sec)	36.8	26.0-40.0
Serum lactate (mmol/L)	9.6	0.5-2.2	Prothrombin time (sec)	15.4	11.5-14.5

Hospital course

The attendant doctor ordered hematological and biochemical investigation that showed that WBC count was 19 x 10 3/μL, and lactic acid level was 9.6 mmol/L. Heparin was given at a 5000 IU dose prophylactically and decision to proceed for CT scan was taken. Abdominal contrast enhancement computed tomography was ordered and results showed large filling defect at the proximal part of the superior mesenteric artery with dilated bowel and porto-mesenteric gas pneumatosis intestinalis. The filling defect seen was obliterating the superior mesenteric artery's lumen denoting acute arterial obstruction distally to its terminal branches.

Air densities were seen within the peripheral branches of the intrahepatic portal tracts mainly in hepatic right lobe pneumoportalis. Dilated small bowel loops reached a diameter of about 3.5 cm with multiple focal areas (mainly ilea loops) of non-enhancing wall showing pneumatosis intestinalis. Small air density was seen at the distal part of the superior mesenteric vein (SMV), and multiple air densities were seen within the peripheral small mesenteric venous branches. Minimal amount of free intraperitoneal fluid was noted. Portal vein was well opacified, and Lower chest cuts were showing minimal right pleural reaction. There was normal enhancement of both kidneys and spleen, and normal CT appearance of the pancreas.

Decision was made for exploration laparotomy, and after immediate resuscitation with D5 normal saline and intravenous antibiotic (ceftriaxone), the patient became oliguric and tachycardic. There was heavily necrotic bowel from 30 cm distal to duodenojejunal junction down to 50cm proximal to ileocecal valve, with an area of engorged bowel proximal to that (~ 50 cm, more toward ischemic). A decision was made with a consultant to close the abdomen, as there was no chance due to his cancer and the status of his bowel. The patient was admitted to the ICU and labelled as Do-Not-Resuscitate (DNR) and arrested after 6 hours. Few case reports have been published about the relationship between cisplatin and acute mesenteric ischemia.

Differential diagnosis

The patient had severe sudden abdominal pain that warranted an immediate clinical care assessment. Visceral perforation needed to be ruled out particularly in a patient who underwent chemotherapy and with the presence of high lactate. Acute pancreatitis was also suspected because the patient also had epigastric pain, however it was ruled out because amylase and lipase were normal. Abdominal x-ray was done and showed no pneumoperitoneum.

The clinical picture was going towards acute mesenteric ischemia, so abdominal computed tomography was requested and showed a large filling defect at the proximal part of the superior mesenteric artery with dilated bowel and porto-mesenteric gas pneumatosis intestinalis. Air densities were seen also within the peripheral branches of the intrahepatic portal tracts mainly in hepatic right lobe pneumoportalis.

Discussion

Established guidelines recommend prophylactic anticoagulation for all oncology patients in high-risk settings, such as hospitalization, major surgery, or postoperatively (16).

However, in the ambulatory setting, prophylactic anticoagulation is not currently recommended except for patients with multiple myeloma receiving thalidomide lenalidomide–based combinations. Based on the results of previous studies, TEE prophylaxis may be advisable for patients receiving cisplatin-based chemotherapy (17).

Among platinum agents (cisplatin, carboplatin and oxaliplatin), the highest rate of TEs was found in cisplatin containing regimens followed by carboplatin and oxaliplatin (18). The rate of TEEs increased especially when adding gemcitabine or vinca alkaloids to platinum compounds (cisplatin or carboplatin). Antithrombotic prophylaxis with nadroparin reduced the risk of developing a TE in comparison to placebo in all chemotherapy regimens (18). To improve the risk-benefit ratio of thromboprophylaxis, clinicians should identify patients at higher risk of TEs, who could have more benefit from anticoagulant administration (19).

Khorana Risk Score is a score for predicting the risk of Venous Thrombotic Events for cancer patients depending on type of cancer and other factors (site of cancer, prechemotherapy platelet count, hemoglobin level or use of red cell growth factors, prechemotherapy leukocyte count, and body mass index (BMI)), regardless of the known risk of cisplatin to cause thromboembolic event in many studies. The type of chemotherapy offered is not considered as a risk category in this score (9,20).

The timing of the TEEs in relation to initiation of therapy further suggests a relation between cisplatin administration and TEEs occurrence (21). In this study, 88% of TEEs occurred within the first 100 days of starting cisplatin.

Acknowledgement

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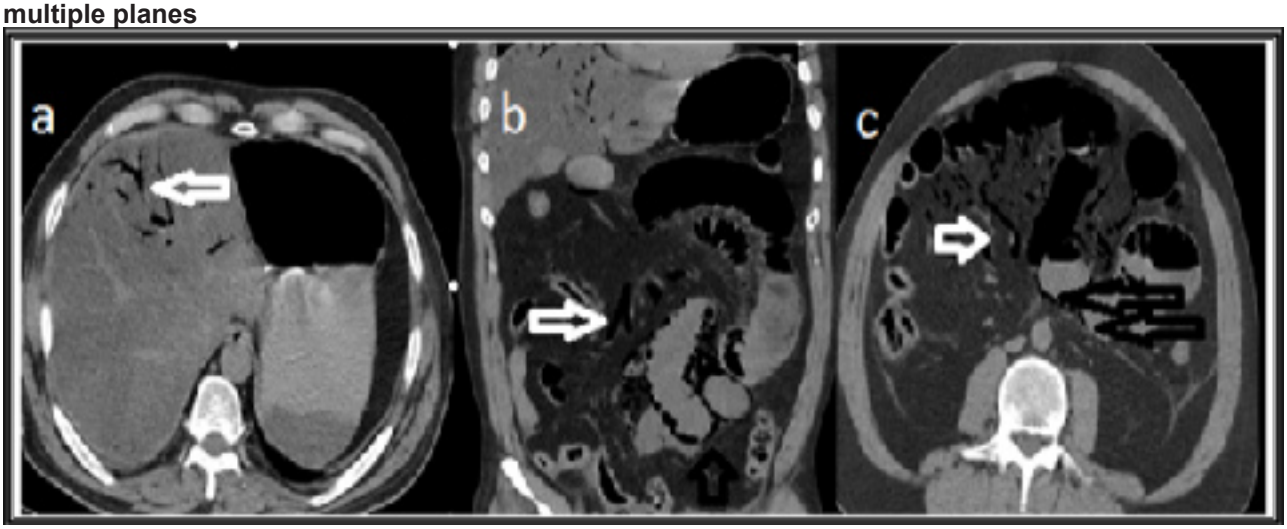
Arterial ischemic events in patients who received cisplatin-based chemotherapy (case reports)

Paper	Tumor	Chemotherapy regime	Findings
Bayne MC (11)	T1N1M0 Tonsillar squamous cell carcinoma	Cisplatin and Fluorouracil	Saddle embolus at bifurcation of aorta causing bilateral limb ischaemia
Tait CD & Rankin EM (12)	TxN3M0 Small cell lung cancer .2T4N3M0 lung adenocarcinoma .3T4N1M0 lung adenocarcinoma	1-Cisplatin and etoposide 2-Cisplatin and Docetaxel 3-Cisplatin and Pemetrexed	1-Non-occlusive thrombus of subclavian artery causing ischemic right hand 2-Occlusive thrombi in lower limb bilaterally and non-occlusive thrombus in thoracic aorta 3-Occlusive thrombus of distal aorta causing bilateral lower limb ischaemia (F)
Rishi A & Ghoshal (13)	Tongue base squamous cell carcinoma	Cisplatin and Radiotherapy	Thrombus occluding descending aorta and left common iliac causing left lower limb ischaemia
Allerton R (14)	T4N1M0 squamous cell nasopharyngeal carcinoma	Cisplatin, 5-Fluorouracil and Vincristine	Thrombus occluding superior mesenteric artery causing complete midgut ischaemia (F)
Doll DC. et al (15)	Testicular germ cell: 1-IIB Yolk Sac Tumour 2-IIA Embryonal Cell 3-III Embryonal Cell 4-III Embryonal Cell	All: 1-Cisplatin, 2-Vinblastine and 3-Bleomycin	1-Myocardial Infarction 2-Cerebrovascular Accident 3-Myocardial Infarction 4-Cerebrovascular Accident

Figure 1: Non-Contrast CT (SOMTOM Definition AS) scan using 128 multi-slice CT of the abdomen at multiple planes

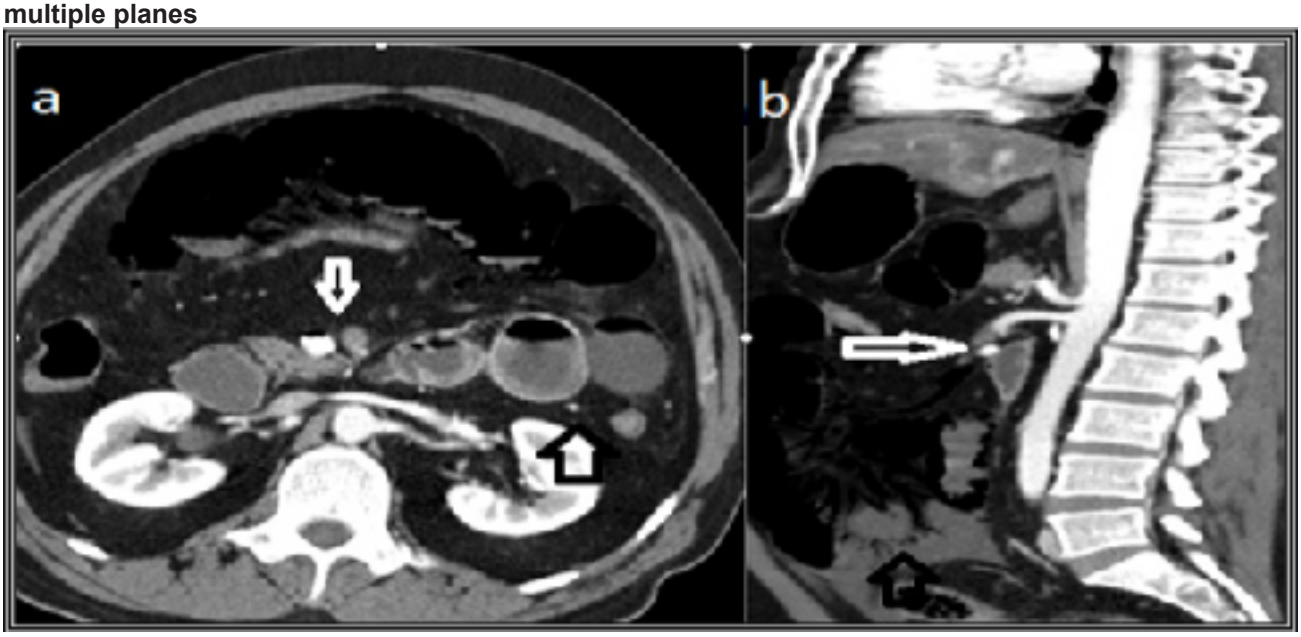


a. Non-contrast axial CT scan at the level of the upper abdomen above the liver hilum with prominent IHBRs with evidence of air densities inside pneumo-bilia (white arrow).

b. Non-contrast coronal CT scan of the whole abdomen with multiple linear shaped air densities seen along the root of the mesenteric vessels (white arrow). Noted dilated small intestinal loops with evidence multiple areas of intra-mural air densities seen inside the dilated bowel (black arrow).

c. Non-contrast axial CT scan at the lower abdominal level with multiple intra-mural air densities seen inside the dilated bowel (pneumo-intestinalis with some of them showing characteristic arc shaped\ (black arrow). Other multiple linear tortuous areas of air densities seen inside the mesenteric fat along the branches of the mesenteric vessels.

Figure 2: Non-Contrast CT (SOMTOM Definition AS) scan using 128 multi-slice CT of the abdomen at multiple planes

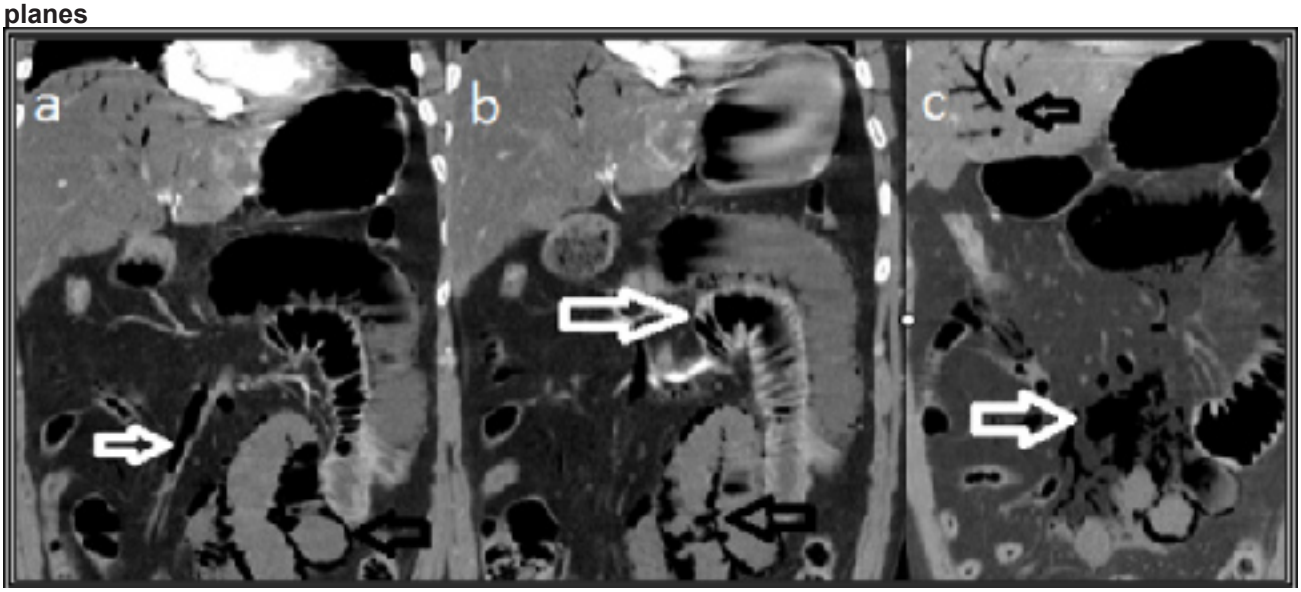


a. Non-contrast axial CT scan at the level of the upper abdomen above the liver hilum showing prominent IHBRs with evidence of air densities inside pneumo-bilia (white arrow).

b. Non-contrast coronal CT scan of the whole abdomen shows multiple linear shaped air densities seen along the root of the mesenteric vessels (white arrow). Note dilated small intestinal loops with evidence of multiple areas of intra-mural air densities seen inside the dilated bowel (black arrow).

c. Non-contrast axial CT scan at the lower abdominal level show multiple intra-mural air densities are seen inside the dilated bowel (pneumo-intestinalis with some of them showing characteristic arc shape (black arrow). Other multiple linear tortuous areas of air densities are seen inside the mesenteric fat along the branches of the mesenteric vessels.

Figure 3: Post-Contrast CT (SOMTOM Definition AS) scan using 128 multi-slice CT of the abdomen at multiple planes



Multiple shapes and distribution of air densities in abnormal areas inside the abdominal cavity with:
a. Linear air densities seen along the root of the mesenteric vessels (white arrow). Multiple linear and curvi-linear shaped areas of pneumo-intestinalis seen at the lower abdomen (black arrow).

b,.The proximal segments of the jejunal loops still shows wall enhancement with multiple linear areas of intra-mural air densities giving the appearance of saw teeth sign (white arrow). Other focal globular shaped areas of pneumo-peritoneum seen at the distal jejunal loops with absence of its wall enhancement (black arrow).

c. Linear air densities seen inside the prominent IHBRs pneumo-bilia (black arrow). Focal area of collected air densities seen at the central part of the peritoneum cavity suggested of large pockets of pneumo-peritoneum (white arrow).

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Abortion training in obstetrics and gynecology residency training program centers in Jeddah, Saudi Arabia

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Abstract

Background: Although abortion is quite a common event for women, it needs special training by the medical team to deal with it. That would improve the safety margin in dealing with abortion. Legal consideration is of paramount value like working according to the local law and gaining informed consent from the authorized personnel.

Aim of the work: Describe the current state of abortion training at current active centers where there is a audi board training program for Obstetrics and Gynecology in Jeddah, Saudi Arabia

Objectives of the work: To assess the availability and type of abortion training presently available to obstetrics and gynecology trainees in Jeddah.

Method: A cross sectional study that was conducted to describe the current state of training for Obstetrics and Gynecology residents in Jeddah.

Results: The study included 70 trainees in Obstetrics and Gynecology in Jeddah. It was found that (64.3%) were females and (46.2%) were in the age group 25-50;71.4% of the collected group considered abortion training is effective. 50% considered first-trimester abortion termination by surgicalmethod is effective training while 64.3% reported that they have efficient training in the medical method of termination.

Conclusion: We concluded from the previous results that training of abortion is variable as there are some residents who had no training and others consider such training is optional while others consider it routine; in addition most of the residents had performed abortion (13-17 weeks) more than 50 times.

Key words: Abortion, training, obstetrics, residency

Introduction

Abortion is considered one of the most common reproductive health issues for women (1), however proper training in dealing with such cases is variable worldwide. In Saudi Arabia, elective abortion is not practiced as contraception; surgical and medical interventions are done for cases of incomplete, missed, or inevitable abortion and mastering this technique a requires sufficient number of cases to accomplish this skill (2).

The American College of Obstetricians and Gynecologists (the College) supports women's access to safe abortion care, as it illustrates some recommendations to implement comprehensive obstetrics and gynecology residency programs including abortion training, and also including training programs for medical school students and extending it to family physicians and advanced practice clinicians (APCs) (2).

Despite, that the Accreditation Council for Graduate Medical Education has included the training in abortion in Ob-Gyn programs since 1996. About half of the applied programs do not provide this type of training, and this has contributed to lack of abortion health care which must include training in induced abortions(4). Based on the Saudi commission for health specialties training curriculum of obstetrics and gynecology, the trainee is expected to diagnose and order the appropriate workup, and manage and respond to the ethical and clinical requirements of the cases (5).

Legislation on abortion is variable among countries especially Islamic countries (6).

Fatwa (an Islamic edict) 4 of the Islamic Jurisprudence in 1990 in Makkah Al-Mukarama (KSA) agreed to allow abortion under certain circumstances. The approval process should go through a specialized committee including competent physicians who will agree that the affected fetus had grossly congenital malformations (untreatable and unmanageable) and the unborn fetus would be a true burden for both the family and itself. Fetal age should be less than 120 days from the moment of conception (7) .

Availability of physicians who have fulfilled the training programs is still the challenge in our country. We performed this study to evaluate actual training of abortion among residents in Saudi Arabia.

Materials and Methods

The current study is a cross sectional study that was conducted to describe the current state of abortion training for residents in the post graduate training program for Obstetrics and Gynecology in Jeddah ,Saudi Arabia.

Study population and data collection
A surveying questionnaire was sent to 70 obstetrics and gynecology residents selected randomly from Dr. Soliman Fakeeh Hospital, International Medical Hospital, King Abdulaziz Hospital, King Abdulaziz Medical City, King Abdulaziz University Hospital, King Fahad Armed Forces Hospital, King Faisal Specialized Hospital and Research Center and Maternity and Children Hospital. These hospitals and centres were chosen as they include obstetrics and gynecology residents training programs. Training was defined as routine if it is included in residents' schedules with individuals permitted to do it. The term optional means that the training is not in the residents' schedules but available for individuals to take, on request.

The questionnaire included:
• Collecting Demographic information including age, sex and residency.
• Collecting details about the program type.
• Collecting data about techniques used in first and second trimester abortion.

Data management:
The data were collected, tabulated, presented and analyzed by computer using Statistical Package for Social Science program (version 20, SPSS Inc., Chicago, IL). Quantitative variables were expressed as the mean ± standard deviation (SD) while the qualitative variables were expressed as numbers and percentage.

Results

The present study is a cross sectional study of residents in postgraduate residency training program for obstetrics and gynecology in Jeddah. The study included 70 residents selected randomly from the eight previously mentioned hospitals.

Results showed that about (64.3%) of the participants were females and most of the participants (46.2%) were in the age group (25-50). About (78.6%) of the participants were from Jeddah. [Table 1]

Table (2) shows that 57.1% of the programs were community programs and 71.4% considered abortion training as part of routine training.

Table 3 illustrates that 50% of participants consider first-trimester abortion done by using surgical method as routine training and 61.5% of them reported that surgical method is found to count less than 50% of their training. First-trimester abortion by using medical method is routine training for 64.3% of participants and accounts for 50-75% of their training. Second-trimester abortion done by using induction is considered to be routine training by half of the participants and optional training by the other half. About (64.3%) were trained to do induction by using misoprostol.

About 35.7% of participants did 10- 50 abortions (less than 13 weeks) while 42.8% did abortions (13-17wks) more than 50 times and more than 17 weeks was <10 times [Table 4].

About 71.4% of participants reported that first-trimester abortion (surgical) in their training was done usually in the operating room while 100% of participants reported that second-trimester abortion (surgical) in their training was usually done in the operating room [Table 5].

About 92.8% performed first-trimester surgical abortion and 71.4% of participants plan to perform first-trimester medical abortion. About 57.2% plan to perform second-trimester medical abortion and 98.6% are going to perform a first-trimester surgical abortion. About 57.2% reported that Dilatation and evacuation was done up to second-trimester gestation [Table 6].

Table 1: Basic characteristics of the participants (n=70):

Basic characteristics	Study group	
	No	%
Gender		
Female	48	64.3
Male	22	35.7
Age group		
25-30	45	64.2
31-35	20	28.5
>35	5	7.3
Residence		
Jeddah		
Other city	55	78.6
	15	21.4
Are you:		
R1	15	21.4
R2	10	14.3
R3	10	14.3
R4	15	21.4
R5	20	28.6

Table 2: Assessing the program type and the training course received concerning abortion among the participants (n=70)

Items	Study group (n=105)	
	No	%
Program type :		
• Community	40	57.1
• University	20	28.5
• Military	5	7.2
• Private	5	7.2
Is abortion training in your program considered to be:		
• Routine training (defined as required training)	50	71.4
• Optional training (residents choose to receive training)	5	7.2
• No training	15	21.4

Table 3: Assessing the techniques used concerning abortion among the participants

Items	Study group (n=105)	
	No	%
Is first-trimester abortion done by using surgical method considered to be:		
• Routine training	35	50.0
• Optional training	30	42.85
• No training	5	7.15
If you answered the previous question as "routine or optional training", out of all your training surgical methods it is found to account for .....(n=65)		
• less than 50%	40	61.5
• 50-75%	20	30.8
• more than 75-99%	5	7.7
Doing First-trimester abortion by using medical method is?		
• Routine training	45	64.3
• Optional training	20	28.5
• No training	5	7.2
If you answered the previous question is "routine or optional training", out of all your training medical method is found to account for about ..... (n=65)		
• less than 50%	5	7.7
• 50-75%	35	53.6
• more than 75%	25	38.7
Is second-trimester abortion done by using induction considered to be:	35	50.0
• Routine training	35	50.0
• Optional training	0	0.0
• No training		
If you answered the previous question is "routine or optional training", out of all your training induction method it is found to account for		
• less than 50%	40	57.2
• 50-75%	20	53.7
• more than 75%	10	14.3
You are trained to do induction by using?		
• Misoprostol	45	64.3
• Amniotic injection PGF-2	5	7.2
• Oxytocin	20	28.5

Table 4: Assessing the techniques used concerning abortion at different gestational ages among the participants (n=70)

Items	Study group (n=70)	
	No	%
How many abortions (Less than 13 wks) did you do during your training?		
None	5	7.15
less than 10	10	14.3
10-50	25	35.7
more than 50	30	42.85
How many abortions (13 - 17 wks) did you do during your training?		
None	5	7.15
less than 10	15	21.4
10-50	20	28.6
more than 50	30	42.85
How many abortions (more than 17 wks) did you do during your training?		
None	10	14.2
less than 10	30	42.8
10-50	20	28.6
more than 50	10	14.4

Table 5: Distribution of different locations where abortion was done among the participants (n=70)

Items	Study group (n=70)	
	No	%
First-trimester abortion (surgical) in your training is done usually in:		
• OR	50	71.4
• Inpatient unit	10	14.3
• L&D	5	7.15
• Clinic	5	7.15
Second-trimester abortion (surgical) in your training is usually done in:		
OR	70	100.0
Inpatient unit	0	0
Clinic	0	0

Table 6: Assessing the attitude concerning abortion among the participants (n=70)

Items	Participants (n=70)	
	No	%
Have you performed first-trimester surgical abortion?		
Yes	65	92.8
No	5	7.2
Did you plan to perform first-trimester medical abortion?		
Yes	50	71.4
No	20	28.6
Did you plan to perform second-trimester medical abortion?		
Yes	40	57.2
No	30	42.8
Plans after residency to provide abortion:		
Are you going to perform a first-trimester surgical abortion?		
Yes	69	98.6
No	1	1.4
Are you going to perform first-trimester medical abortion?		
Yes	70	100.0
No	0	0.0
Are going to perform second-trimester surgical abortion?		
Yes	70	100.0
No	0	0.0
If you plan to provide second-trimester abortion, which method you will use?		
D&E for all second-trimester gestation	20	28.6
D&E up to specific second-trimester gestation	40	57.2
Induction beyond that specific second-trimester gestation	7	10.0
Always induction	3	4.2

Discussion

The present study is a cross sectional study that included 70 residents of the obstetrics and gynecology residency programs in Jeddah, to understand the current state of abortion training in Saudi Arabia. About 71.4% of residents reported that abortion training is routine training, 50% of participants considered the first trimester abortion using surgical method and 64.3% by using medical method as routine training.

A cross-sectional study in USA done by Steinauer et al (8) to survey the availability of abortion training program in obstetrics and gynecology residency training programs, considered it routine training as the residents were not permitted to do it as optional training, and found that 64% (121) of programs had routine training, 71% first trimester aspiration abortion and 66% medication abortions and Liauw et al. (9) reported the state of abortion training in Canada, found about 66% of residents were competent in first-trimester surgical abortion and about 50% had routine training abortion programs. Also Roy et al. (10) considered it routine training in half of their residency program.

Regarding second-trimester abortion done by using induction it was considered to be routine training by half of the participants and optional training by the other half; about (64.3%) were trained to do medical induction while Liauw et al. (9) reported 35% expected to be competent in second-trimester surgical abortion and about 15% of residents had no abortion training as they were not aware about it within the program. Eastwood et al. (11) reported second-trimester induction (51% of programs) and (10%) no training corresponding to 7.15% in our study.

Conclusions

We concluded from the preceding results that training of abortion is variable as there are some residents who had no training and others consider such training is optional and others consider it routine; in addition most ; residents performed abortion (13-17 weeks) more than 50 times.

Limitations:
One of the limitations is the small sample size and that it was taken from one geographical area (Jeddah). Also we suggest the involvement of the programs directors in collecting data in order to have complete evaluation.

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Evaluation of knowledge, attitude and use of dietary supplement and hormones among male gym attendees in Taif city, Saudi Arabia

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Abstract

Background: Nutritional supplements and hormones are used at a high rate throughout the world.

Objectives: to evaluate the prevalence of use of dietary supplement and hormones among gym attendees, and to assess participants' knowledge and attitude towards them.

Methods: A cross-sectional study was done on 338 gym attendees in Taif city. A self-administered questionnaire was used. It included items on their sociodemographic characters, their exercise history, and their use of any nutritional supplements or hormones.

Results: About 30% of the participants (29.6%) used nutritional supplements or hormones, and the most commonly used were protein powder (22.5%) and vitamins (13.6%). Among them, 11.2% agreed on hypertension, 28.7% agreed on liver disease, 35.5% agreed on weight gain, and 40.2% agreed on kidney disease as a side effect of supplements. For hormones, 21.3% agreed on hypertension, 22.2% agreed on diabetes mellitus, 39.1% agreed on weight gain, and 21.1% agreed on vision problems as a side effect of their use. Of the participants, 35.8% agreed that psychiatric problems are side effects, 25.4% agreed on testicular hypotrophy, and 37.9% agreed on breast enlargement. A non-significant relationship was found between the participants' level of education and both their use of any nutritional supplements or hormones, and source of information, and the majority of those who were not using nutritional supplements or hormones (79.5%) were not using a special diet.

Conclusion: All gyms attendees should consult a healthcare professional before the use of hormones or nutritional supplements, and gym coaches should be educated regarding hormones and nutritional supplements.

Key words: knowledge, attitude, supplement, hormones, gym, Taif

Introduction

The concept of body image is now becoming a trend that is increasing with the influence of media. Thus, there is growing awareness about appearance [1]. To achieve the desired body image, it is essential to have a good diet, sufficient rest and an active exercise program [2]. Some athletes and exercising people use dietary supplements to improve their performance [3].

Nutritional supplements are divided into food components, for example protein, and non-foods, or pharmaceutical preparations, for example vitamins and minerals capsule or tablet, supplying one or more nutrients in a concentrated form including proteins, minerals, vitamins, trace elements, and other components that are theoretically present in a normal and balanced diet [2].

Nutritional supplements are usually present in an untypical form of food, including tablets, capsules, powders, or pills [4]. People use dietary supplements for many reasons: increasing the whole body fat-free mass (i.e., body building) [4], general improvement of health [4], enhancement of energy and general performance [5], and avoidance of specific diseases [6].

These supplements may also have their liabilities with short and long-term side effects [7]. Short term side effects can include: digestive problems, headache, muscle cramping etc. Long term side effects are reported as: cardiovascular problems, kidney stones, kidney failure, gout etc [8]. Unfortunately about 55% of dietary supplement users are consuming them without any professional guidance [9].

A study conducted in Riyadh, Saudi Arabia to investigate prevalence and patterns of the use of protein supplements among gym users, revealed that 28% of the general population of gym users use more than the recommended dose of protein supplements compared to 9% of medical students who are gym attendees and previous studies have indicated that 1.4-2.0g/kg/day is the amount needed for a physically active individual [10].

A study in Beirut, Lebanon, showed that the prevalence of nutritional supplement use was 36.3% among fitness club participants and the supplement most commonly consumed by the participants was protein powder [11]. In the United States, more than 3 million people were reported to be using or to have used ergogenic supplements [12]. Compared with other countries, Saudi Arabia had a lower prevalence of hormone use (7.9%) than was found in Al Ain, UAE (22%), [13] and in Germany (13.5%). [14] However, the prevalence in this study was higher than that found in Trinidad and Sweden, both of which had a prevalence of 3% [15,16].

Different rates of the use of nutritional supplements and hormones have been reported throughout the world. However, limited data are available on the prevalence of their use by regular gym members in Taif city, Saudi Arabia. Thus, this study aimed to assess the knowledge and attitude toward nutritional supplement intake among gym attendees in Taif city. The aims of the present study were to evaluate the prevalence of use of dietary supplement and hormones among gym attendees, and to assess participant's knowledge and attitude towards dietary supplements and hormones.

Subjects and methods

Study design: A cross-sectional study was done in the period from February to May 2019.

Study settings: All gyms in Taif city; three gyms were chosen randomly named: fitness time gym, golden gym, and super – training gym.

Sampling methodology: The inclusion criteria were all gym members who were in the gym at the time of survey and who were above 18 years old. The exclusion criteria were female gyms.

Study instrument: A self-administered questionnaire was distributed to all respondents in the chosen gyms in Taif city. The questionnaire included items on the participant's age, educational level, smoking status, weight, and height. It included questions on the total period of exercise, frequency of exercise per week, duration of daily exercise, following a special diet, use of any nutritional supplements or hormones and their type, the main reason they use dietary supplements, the way the users were introduced to supplements and where they get their information, and their opinions regarding the side effects of the used supplements and hormones. The response rate was 63.2% and 338 gym attendees were the study participants.

Ethical considerations: Ethical approval was obtained from the college of medicine research ethical committee at Taif University, Saudi Arabia. Verbal and written consent was obtained from all participants after explaining the aim and nature of the study.

Data analysis: Data was analyzed by the Statistical Package for Social Sciences (IBM SPSS statistics 26). Descriptive data was presented as numbers and frequencies.

Results

Table 1 shows that 72.5% of the participants were of an age ranging from 18-25 years; most of them (54.4%) had a bachelor's degree, and 75.7% were non-smokers. Most of the studied participants had a normal weight (53.6%).

Of the participants, 47% started practicing exercises for less than one month prior to the study, 37.3% practice exercises for 3-5 times/ week, 52.7% practice it for 1 to < 2 hours, and 30.8% were following a special diet (Table 2).

About 30% of the participants (29.6%) were using nutritional supplements or hormones (Figure 1), and the most commonly used were protein powder (22.5%) and vitamins (13.6%) (Figure 2). When nutritional supplements or hormone users were asked about the reason for use, the most common reason was body building (21.6%) followed by the desire to prevent diseases (9.2%) (Figure 3).

Figure 4 shows that 13.6% were introduced to supplements and got the information they required when using it, from online websites, 12.7% from their coach, and 5.6% from a nutritionist.

Table 3 shows that according to the attitude of the participants towards the side effects of supplements, 11.2% agreed on hypertension, 28.7% agreed on liver disease, 35.5% agreed on weight gain, 40.2% agreed on kidney disease, 24.6% agreed on allergy, 36.75 agreed on gastric upset, and 16.9% agreed on muscle pain.

According to the attitude of the participants towards the side effects of hormones, 21.3% agreed on hypertension, 22.2% agreed on diabetes mellitus, 39.1% agreed on weight gain, and 21.1% agreed on vision problems. Of the participants, 35.8% agreed that psychiatric problems are side effects, 25.4% agreed on testicular hypotrophy, 37.9% agreed on breast enlargement, 18% agreed on increased RBC, and only 0.3% agreed on prostatic hyperplasia (Table 4).

A non-significant relationship was found between the participants' level of education and both their use of any nutritional supplements or hormones, and source of information (p= >0.05) (Figures 5 and 6). On the other hand, a highly significant difference was found between following a special diet and the use of any nutritional supplements or hormones, as the majority of those who were not using nutritional supplements or hormones (79.5%) were not using a special diet (p= < 0.001).

Table 1: Distribution of the studied participants according to their age, education, smoking status, and BMI (No.: 338)

Variable	No. (%)
Age group (years):	
18-25	245(72.5)
26-30	48 (14.2)
31-40	25(7.4)
>40	20 (5.9)
Education:	
Intermediate	7 (2.1)
High school	139 (41.1)
Bachelor's	184 (54.4)
Master's	6 (1.8)
Above master's	2(0.6)
Smoking status:	
Smoker	82 (24.3)
Nonsmoker	256 (75.7)
Body mass index (BMI):	
Underweight (<18)	34 (10.1)
Normal weight (18-24.99)	181 (53.6)
Overweight (25-29.99)	62 (18.3)
Obese I (30-34.99)	37 (10.9)
Obese II (35-39.99)	16 (4.7)
Obese III (>40)	8 (2.4)

Table 2: Distribution of the studied participants according to the period they started to exercise, frequency and duration of exercise and following a diet

Variable	No. (%)
Total period of exercise	
- <1 month	159 (47)
- From 1 month to 6 months	87 (25.7)
- From 7 months to a year	15 (4.4)
- More than year	77 (22.8)
Frequency of exercise per week	
- <3 times	142 (42)
- 3-5 times	126 (37.3)
- >5 times	70 (20.7)
Duration of exercise	
- <1 h	144 (42.6)
- 1-<2h	178 (52.7)
- >2h (.....)	16(4.7)
Following special diet	
- Yes	104 (30.8)
- No	234(69.2)

Figure 1: Distribution of the studied participants according to the usage of any nutritional supplements or hormones

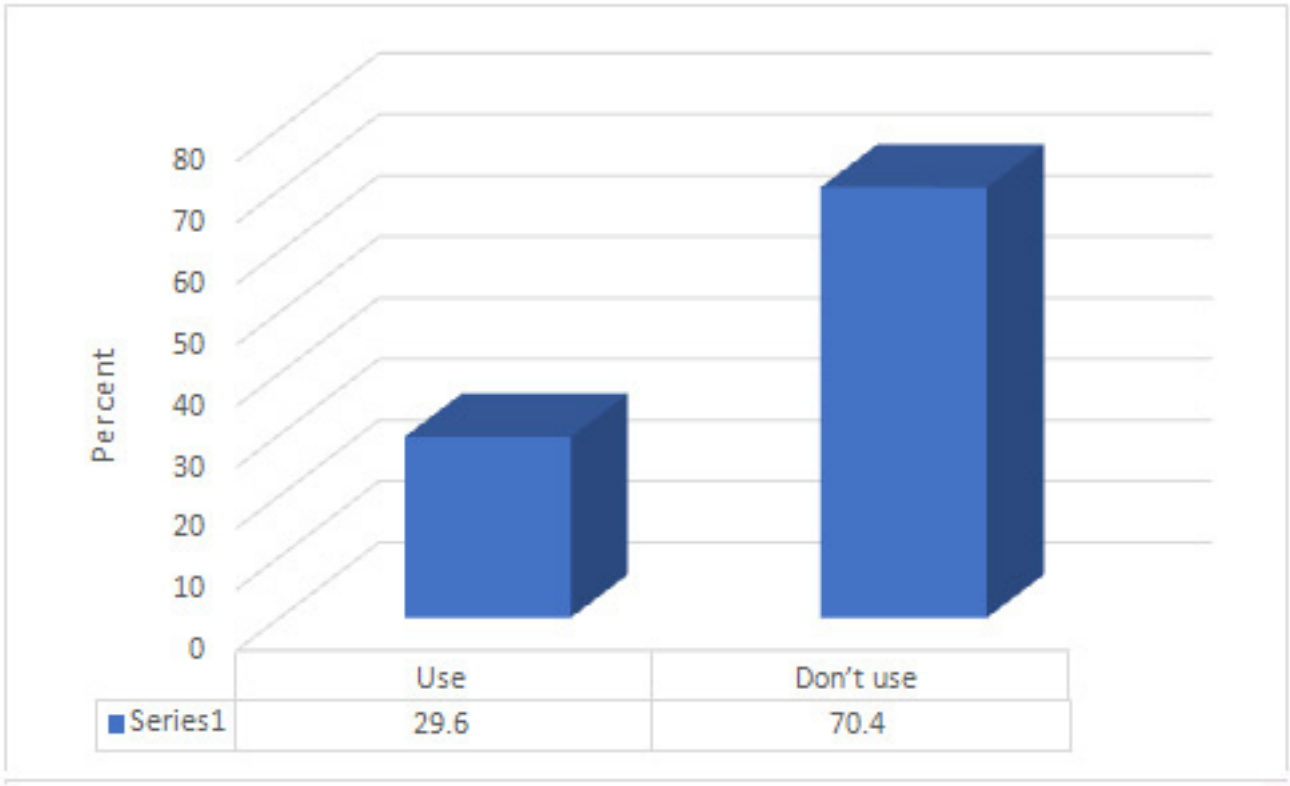


Figure 2: Distribution of the studied participants according to type of used supplements

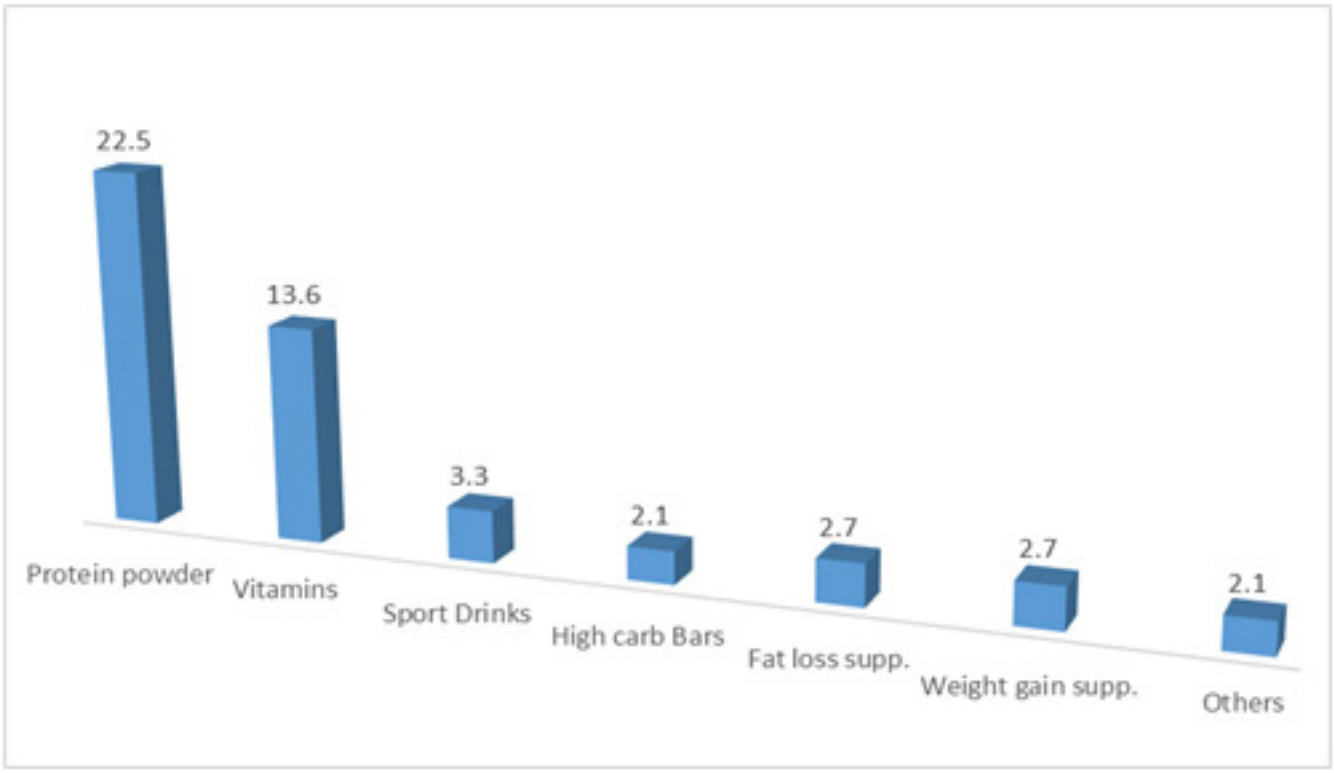


Figure 3: Distribution of the studied participants according to the main reason they use dietary supplements

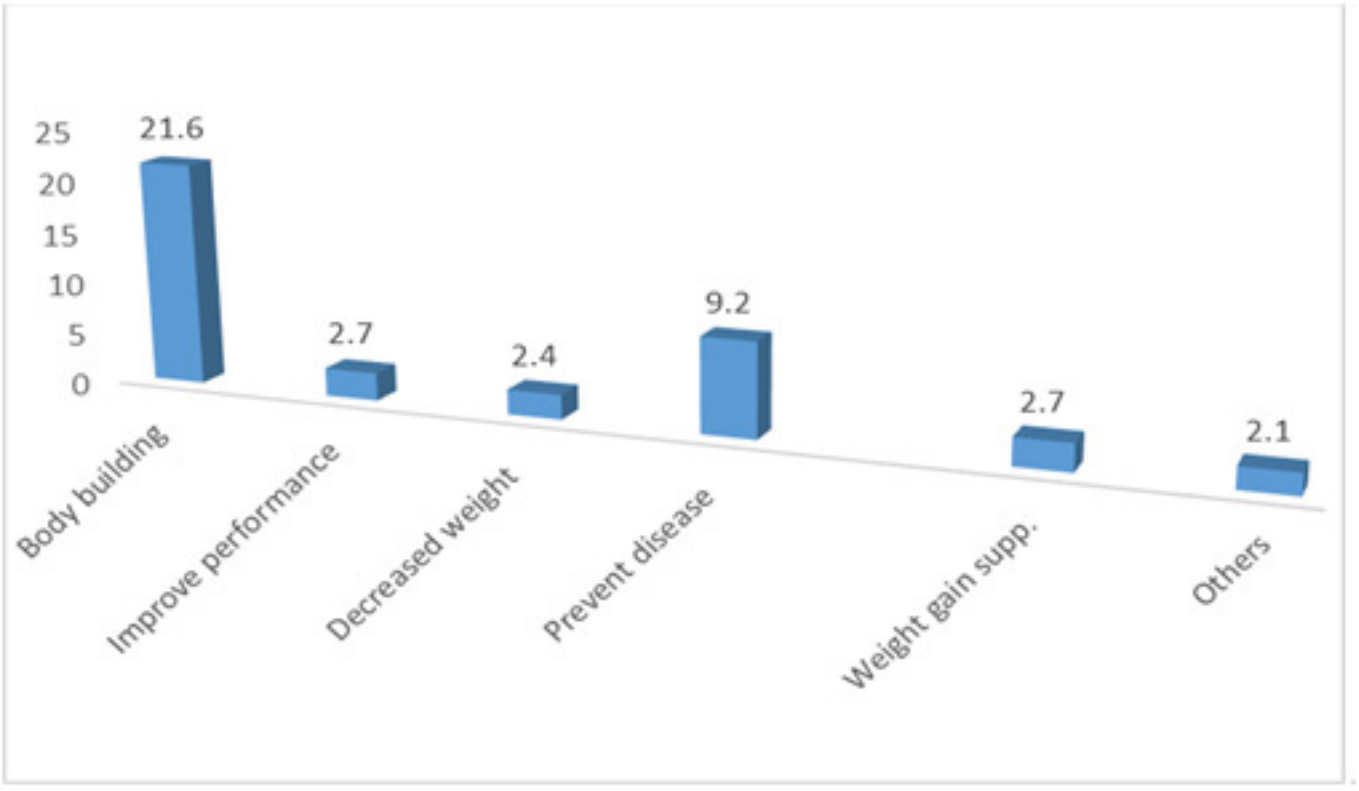


Figure 4: Distribution of the studied participants according to the way the users were introduced to supplements and where they get the information you require when using them

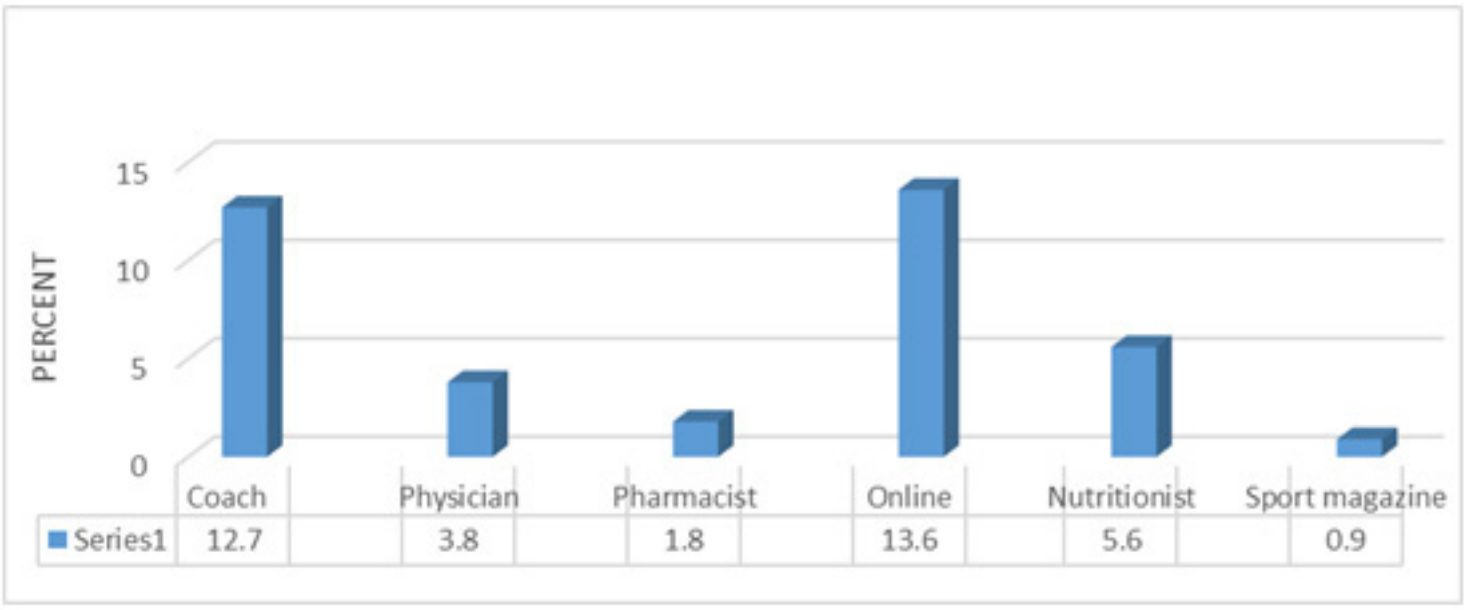
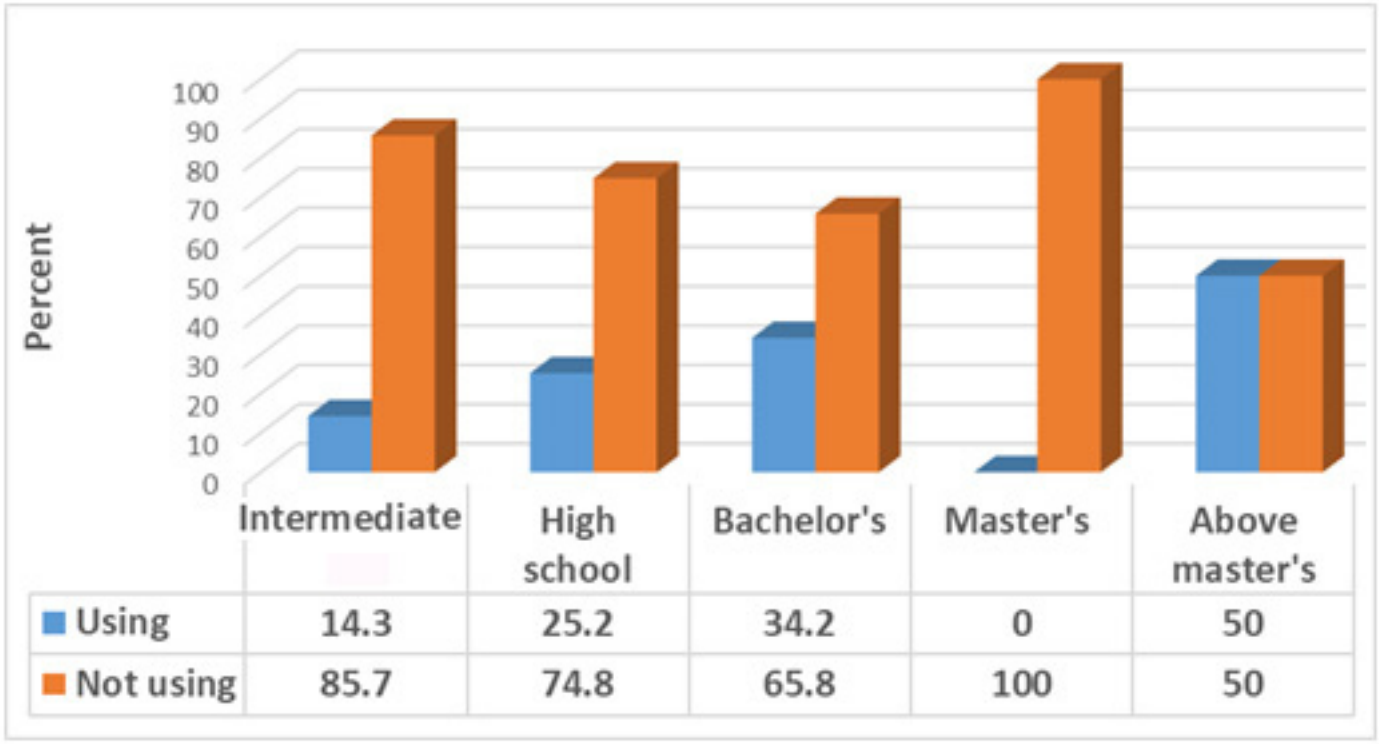


Figure 5: Relationship between participant's level of education and the use of any nutritional supplements or hormones



N.B. (Chi-Squared test ($\chi 2$) =6.91, p-value=0.14)

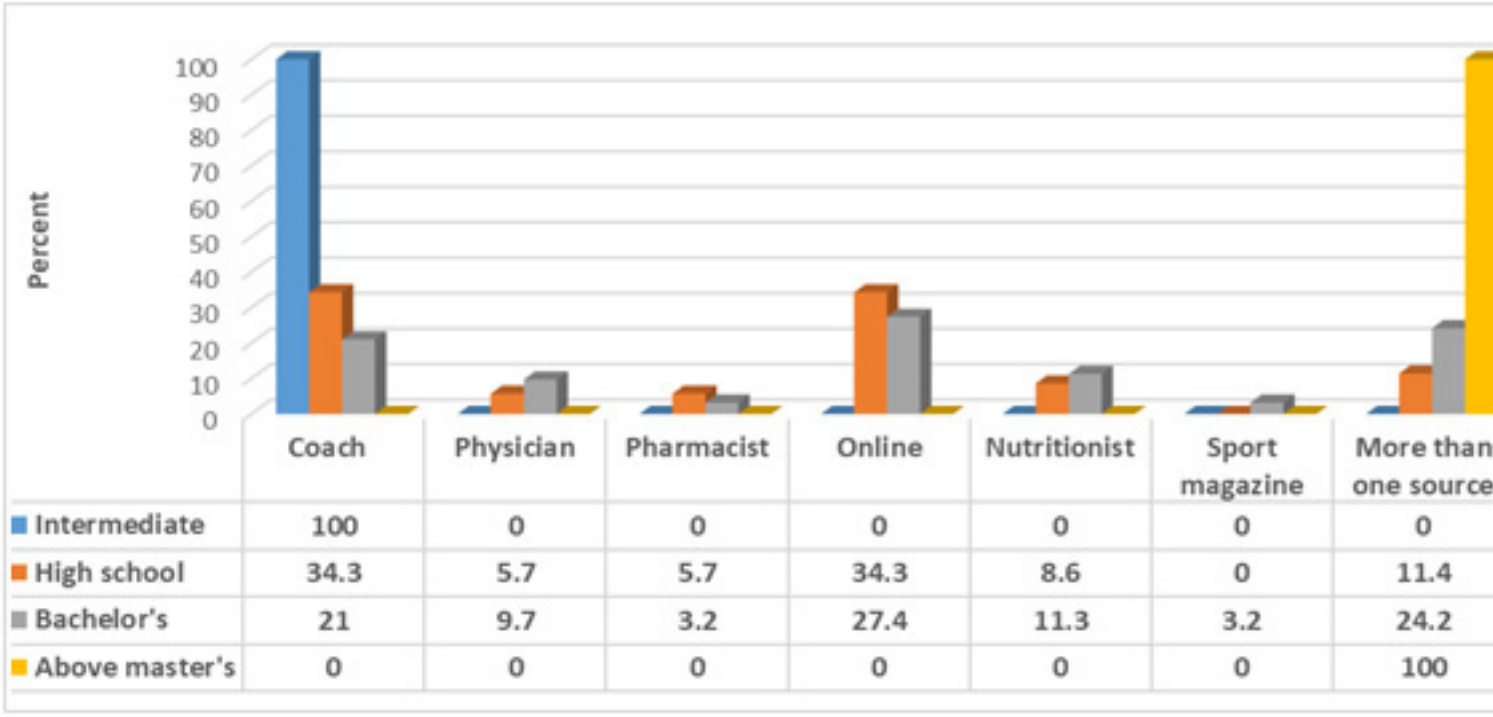
Table 3: Distribution of the studied participants according to their opinions about the side effects of the used supplements

Variable	No. (%)
Do you consider hypertension a side effect of supplement use?	
- Yes	38 (11.2)
- No	117 (34.6)
- I don't know	183 (54.1)
Do you consider liver disease a side effect of supplement use?	
- Yes	97 (28.7)
- No	75 (22.2)
- I don't know	166 (49.1)
Do you consider weight gain a side effect of supplement use?	
- Yes	120 (35.5)
- No	79 (23.4)
- I don't know	139 (41.1)
Do you consider kidney disease a side effect of supplement use?	
- Yes	136 (40.2)
- No	61 (18)
- I don't know	141(41.7)
Do you consider allergy a side effect of supplement use?	
- Yes	83 (24.6)
- No	79 (23.4)
- I don't know	176 (52.1)
Do you consider gastric upset a side effect of supplement use?	
- Yes	124 (36.7)
- No	59 (17.5)
- I don't know	155 (45.9)
Do you consider muscle pain a side effect of supplement use?	
- Yes	57 (16.9)
- No	130 (38.5)
- I don't know	151 (44.7)
Do you consider increased urination a side effect of supplement use?	
- Yes	110 (32.5)
- No	71 (21)
- I don't know	157 (56.4)

Table 4: Distribution of the studied participants according to their opinions about the side effects of the used hormones

Variable	No. (%)
Do you consider hypertension a side effect of hormones use?	
Yes	72 (21.3)
No	53 (15.7)
I don't know	213 (63)
Do you consider diabetes mellitus a side effect of hormones use?	
Yes	75 (22.2)
No	61 (18)
I don't know	202 (59.8)
Do you consider weight gain a side effect of hormones use?	
Yes	132 (39.1)
No	40 (11.8)
I don't know	166 (49.1)
Do you consider vision problems a side effect of hormones use?	
Yes	41 (12.1)
No	82 (24.3)
I don't know	215 (63.6)
Do you consider psychiatric problems a side effect of hormones use?	
Yes	121 (35.8)
No	47 (13.9)
I don't know	170 (50.3)
Do you consider prostatic hyperplasia a side effect of hormones use?	1 (0.3)
Yes	93 (27.5)
No	50 (14.8)
I don't know	
Do you consider testicular hypotrophy a side effect of hormones use?	
Yes	86 (25.4)
No	53 (15.7)
I don't know	199 (58.9)
Do you consider breast enlargement a side effect of hormones use?	
Yes	128 (37.9)
No	35 (10.4)
I don't know	175 (51.8)
Do you consider increased RBC a side effect of hormones use?	
Yes	61 (18)
No	47 (13.9)
I don't know	230 (68)

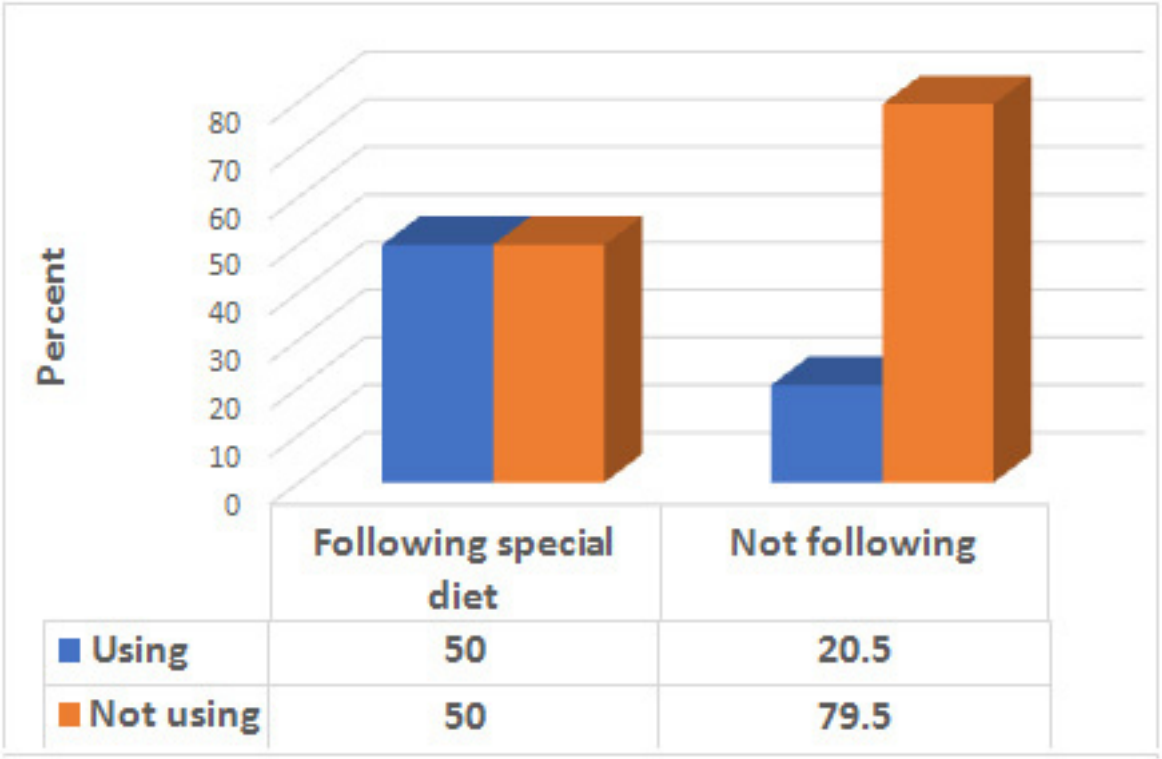
Figure 6: Relationship between participant's level of education and source of information



	Coach	Physician	Pharmacist	Online	Nutritionist	Sport magazine	More than one source
Intermediate	100	0	0	0	0	0	0
High school	34.3	5.7	5.7	34.3	8.6	0	11.4
Bachelor's	21	9.7	3.2	27.4	11.3	3.2	24.2
Above master's	0	0	0	0	0	0	100

N.B. (Chi-Squared test ($\chi 2$) = 12.57, p-value=0.81)

Figure 7: Relationship between following a special diet and the use of any nutritional supplements or hormones



	Following special diet	Not following
Using	50	20.5
Not using	50	79.5

Discussion

The present study that evaluated the knowledge, attitude and use of dietary supplement and hormones among gym attendees, was the first study to be done in Taif city.

Most of our participants were in the age that ranged from 18-25 years, and 75.7% of them were non-smokers; a result that showed that gym attendees have more insight into smoking risks.

People of this age group and with this level of education (54.4% of participants had a bachelor's degree), have more awareness of the health benefits of exercising compared to their peers in the population.

In our study, 29.6% of the participants were using nutritional supplements which is the least compared to other studies done in Tehran (66.7%) [17], Riyadh (47.9%) [18], Brazil (36.8%) [19], Beirut city (36.3%) [20], and Italy (30.1%) [21].

In the present study and both studies conducted in Riyadh and Beirut, the most common type of nutritional supplement used was protein powder [18].

As reported in the current study, gym attendees had their source of information from online (13.6%), and coaches (12.7%) and it seems strange that the participants didn't consider physicians (3.8%) as their main source of information. This indicates the need for coaches to have some medical training or provision of some medical supervision in these gyms to ensure the safety of their members.

Most of our respondents used supplements for better performance, to enhance their physical appearance, improve health, recovery and to prevent injury. Dietary supplement use may be irrational if the exerciser has a healthy diet and meal replacements that occur through the advice of a physician or dietitian.

In the study of the use of hormones and nutritional supplements that was done in Riyadh and conducted in 2016, it was found that most of the participants were not aware of the side effects of nutritional supplements such as: high blood pressure, liver disease, kidney disease, allergies, and muscle pain, although they had more knowledge about hormonal risk, when compared to their knowledge about risks of nutritional supplements. [18]

In our study most of the questions regarding the knowledge of side effects of nutritional supplements and hormones were answered by participants with "I don't know". This result shows that there was not much difference between the knowledge regarding the hormones' risk and nutritional supplements' risk among the participants.

In addition, our participants used them blindly without education. This could be due to their dependence on the coach and the online websites to gain information about nutritional supplements and hormones, however these sources have no scientific knowledge to give them validity to prescribe the nutritional supplement as individuals have different needs, risks and special conditions and even though there is no adequate fellow up for the users.

It is not a fault to care about bodybuilding and body image, which is the most common reason that most gym attendees use nutritional supplements and hormones, but the mistake is that when they want something from external sources, it could harm their body from the inside.

Limitations

One of the limitations of this study was using self-reported questionnaires that may be prone to recall bias. The use of a cross-sectional study showed the relation between variables without including a cause-effect relationship.

Conclusion

Based on the results of the present study, all gym attendees should be advised to consult a healthcare professional before the use of hormones or nutritional supplements. It is recommended that gym coaches should be educated regarding hormones and nutritional supplements by courses conducted by an expert. In addition, all gyms should be under the supervision of the Ministry of Health.

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Women's Awareness of Risk of DVT During Pregnancy and Puerperium: A Cross Sectional Study in Jeddah

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Abstract

Background: Venous thromboembolism (VTE) is considered a significant leading cause of mortality and morbidity during pregnancy and puerperium. Therefore, women should be aware of their own risks of developing VTE.

Objectives: To explore the level of awareness among women about the risk of DVT during pregnancy and puerperium.

Methods: This was a cross-sectional study using a self-administered web-based survey of 223 Saudi women aged 22 to 65 years from Jeddah. Participants were selected using a convenient sampling technique from August to September 2019. The questionnaire included demographic, socioeconomic, obstetrics and gynecological data as well as 14 disease-specific questions. A total score was calculated.

Results: Women were generally aware of deep venous thrombosis definition (85%), symptoms (96%), diagnosis (68%), prevention (84.2%), and treatment (74.3%). However, 47.7% of them were unaware of possible pulmonary complications. Many did not recognize gender (31.1%), obesity (15.3%), pregnancy (35.6%), and labour (41%) as risk factors. Their median awareness score was 10 (66.7%) with a significant positive correlation with their socioeconomic level (R=0.184, P=0.006). (21.6%) of the participants were unaware of VTE risk (scored <60%) and were found to have a significantly lower education (p=0.002) and socioeconomic level 0.008 compared to those with better awareness.

Conclusion: Adult Saudi women from Jeddah are aware of VTE during pregnancy and puerperium but with serious defects in their knowledge concerning the risk factors and the possible pulmonary complications. The awareness is positively related to their socioeconomic level. A well constructed epidemiological studies are recommended to further address the topic and help in planning better education for Saudi women.

Key words: Saudi, awareness, deep venous thrombosis, DVT, Venous thromboembolism, VTE, pregnancy, puerperium.

Introduction

Venous thromboembolism (VTE) is considered a significant leading cause of mortality and morbidity during pregnancy and puerperium[1]. Naturally, pregnancy is associated with modifications in two systems, coagulation, and fibrinolysis. These changes include an increase in a number of clotting factors, a decrease in protein S levels, and a significant fall in the activity of activated protein C [2]. Estimation was done which suggested that VTE holds a 10-fold increase in the risk of VTE in pregnant women (due to their hypercoagulable status) compared with non-pregnant women of the same age [3]. Deep venous thrombosis (DVT) comprises (85%) of all pregnancy-related symptomatic cases, with approximately 66% of all DVT cases that took place in the prepartum period while half of these cases occurred before the third trimester [4]. Interestingly, Pulmonary Embolism (PE) is moderately less eventful during pregnancy. However, it may occur more frequently than DVT in puerperium [5]. Women are at high risk due to their previous history of VTE, Thrombophilia, Antiphospholipid Syndrome, immobilization, recurrent miscarriages, and previous surgical history [4,6]. Additionally, more risk factors contributed to increasing the risk of VTE which included: morbid obesity, the use of external estrogen, and multi-parity[7,8]. For Saudi women, the VTE risk is considered high in the view of the prevalent high parity, obesity, advanced maternal age, repeated cesarean section and consanguinity marriages with the risk of inherited thrombophilia. Their incidence of VTE was reported to be 1.25 per 1000 deliveries[9]with a mortality rate of 0.025 cases per 1,000 deliveries. One Saudi study reported an incidence of 9% post-delivery[10]. Despite the importance of VTE among pregnant women, there is a relative global lack of public awareness[11,12,13]. Most published previous work in Saudi Arabia stressed on physician adherence to VTE guidelines of screening and prophylaxis in obstetric cases[9,14] helped by the Saudi Center for Evidence-Based Healthcare (EBHC) Department with few reports addressed the women awareness [15] despite the known high prevalence of pregnancy rate. Therefore, the objective of this study was to explore the level of awareness among women about the risk of VTE during pregnancy and puerperium.

Methodology

This was a cross-sectional study using a self-administered one-time web-based survey of Saudi women. This survey was conducted from August to September 2019. The study was approved by the Ethical Committee at Ibn Sina National College for Medical Studies in Jeddah. The study included Saudi adult females living in Jeddah with any marital status who have access to social media. Participants were selected using a convenient sample with consecutive techniques. Exclusion criteria included healthcare workers and women with incomplete data, previous VTE conditions, bleeding tendency or chronic autoimmune diseases, or were on oral anticoagulant therapy for any reason. The questionnaire was constructed in Arabic by an expert. A pilot study of 50 cases was performed to test the reliability of the questionnaire.

The participants were asked about their consent to participate at the start of the questionnaire and were reassured about the confidentiality of their data. The questionnaire included demographic, socioeconomic, obstetrics and gynecology data as well as 14 questions about their knowledge of the disease including definition, symptomatology, diagnosis, treatment, risk factors, complications and prevention. A separate score for socioeconomic level (SEL) was calculated including the education, monthly income, occupation, and type of residence (rented or owned houses) with a total of 14 points scale. Individuals scored 5 or less, from 6-10 and more than 10 were considered low, intermediate, and high SEL respectively.

For the VTE awareness questions, a wrong answer scored zero and right answer scored 1 and a total score out of 15 was calculated for each participant. We considered awareness if 60% of responses were right. Therefore, the participants were divided into 2 groups using the total score (<=9 unawareness and >9 awareness groups).

Statistical analysis: The Statistical Package for Social Sciences version 21 (SPSS Inc., Chicago, IL, USA) was used for data analysis and construction of figures. Descriptive statistics were carried out for all variables using median or mean according to the studies variable. Comparison between the 2 groups was performed using independent Student-Test. Correlation was tested using Pearson correlation coefficient. For all statistics, a two-sided p-value <0.05 was considered statistically significant.

Results

This study included 223 Saudi women from Jeddah, aged 22 to 65(median age 31) years, 72 of them (32.4%) were employed. Their median SEL score was 10 ranging from 6 to 14 which corresponded to the intermediate level. Some had chronic illnesses especially diabetes 13 (5.9%) and hypertension 14 (6.3%) and 38 (17.1%) were on oral contraceptives [Table 1].

Concerning their Obstetric and Gynecological history, 55 (24.8%) were single, 24 (10.8%) had PCOD, 157 (70.4%) had history of pregnancy while 11 of them had twin pregnancy (7%), 69 had an abortion (30.9%) and 99 delivered vaginally (44.6%) [Table 2].

Women were aware of DVT definition (85%), symptoms (96%), methods of diagnosis: blood test (15.8%), x-ray (16.2%) or both (68%) and treatment (74.3%). However, the frequency of wrong answers in their DVT awareness was in the definition (14.9%), possible pulmonary complications (52.3%) and (14%) were unaware of any DVT complications [Table 3].

Women were aware of the methods of prevention of DVT especially the exercise (58.1%) and walking (26.1%). However, some did not recognize gender (31.1%), obesity (15.3%), pregnancy (35.6%), or labor (41%) as risk factors for DVT. On the other hand, they considered factors such as diabetes (52.7%), asthma (14%), and TB (27.5%) as risk factors [Table 4].

The median total score was 10 ranging from 5 to 14 and correspond to accepted DVT awareness among participants. The awareness score was significantly correlated with the socioeconomic level of the participants [Figure 1]. The awareness group included 174 (78.4%) participants and the other group of unawareness included 48 (21.6%) participants. The group of awareness was significantly younger (p=0.049), with higher education (p=0.002) and socioeconomic level (p=0.008), but a lower number of births (p=0.035). They could better recognize the main VTE risk factors (p=0.000), the emergency (p=0.015) and the pulmonary complications of VTE (p=0.030) compared to the unawareness group [Table 5].

Table 1: Demographic characteristics of the participants (n=223) Saudis from Jeddah

Variables		N	%
Age: median(min-max): years		31(22-65)	
Occupation status	Housewife	83	37.4
	Employed	72	32.4
	Student	48	21.6
	Retired	19	8.6
Education	Elementary school	2	.9
	Middle school	4	1.8
	High school	45	20.3
	College graduates	171	77.0
Monthly income	<1000SR	23	10.4
	1000-5000SR	55	24.8
	>5000-10000SR	105	47.3
	>10000SR	39	17.6
Type of residence	Rented	79	35.6
	Owned	143	64.4
Socioeconomic level: median (min-max)		10 (6-14)	
Number of family members: median(min-max)		5(1-12)	
Socioeconomic level: median (min-max)		8 (5-10)	
Chronic illness	Diabetes	13	5.9
	Hypertension	14	6.3
Medication	OCP	38	17.1
	Diuretic	2	.9
	Others	8	

Table 2: Obstetric and gynecological characteristics of the participants (n=223)

		n	%
Age of menarche: mean ±SD		12.8±1.52	
Diagnosed with PCOD	Yes	24	10.8
Marital status	Single	55	24.8
	Married	159	71.6
	Divorced	8	3.6
Pregnancy		157	70.4
History of twin pregnancy		11	7.0
History of Abortion		69	30.9
Number of births		88	39.4
Type of childbirth delivery	SVD	99	44.6
	CS	26	11.7
	Both	28	12.6
Type of feeding	Breast	71	32.0
	Artificial	27	12.2
	Both	55	25.0

Table 3: Women's awareness about VTE and its complications

		N	%
Definition	Blood clot formation	189	85.1
	Cannot form a clot	33	14.9
Symptoms	Leg swelling	152	68.5
	Leg redness	17	7.7
	Leg pain	44	19.8
	Skin abrasion	7	3.2
Diagnosis	Bloodtest	35	15.8
	X-ray	36	16.2
	Both	151	68.0
Treatment	Not an emergency	53	23.9
	Go to ER	165	74.3
	Take pain killers	4	1.8
Complications	Lung complications	116	52.3
	Limping	75	33.8
	No complications	31	14.0

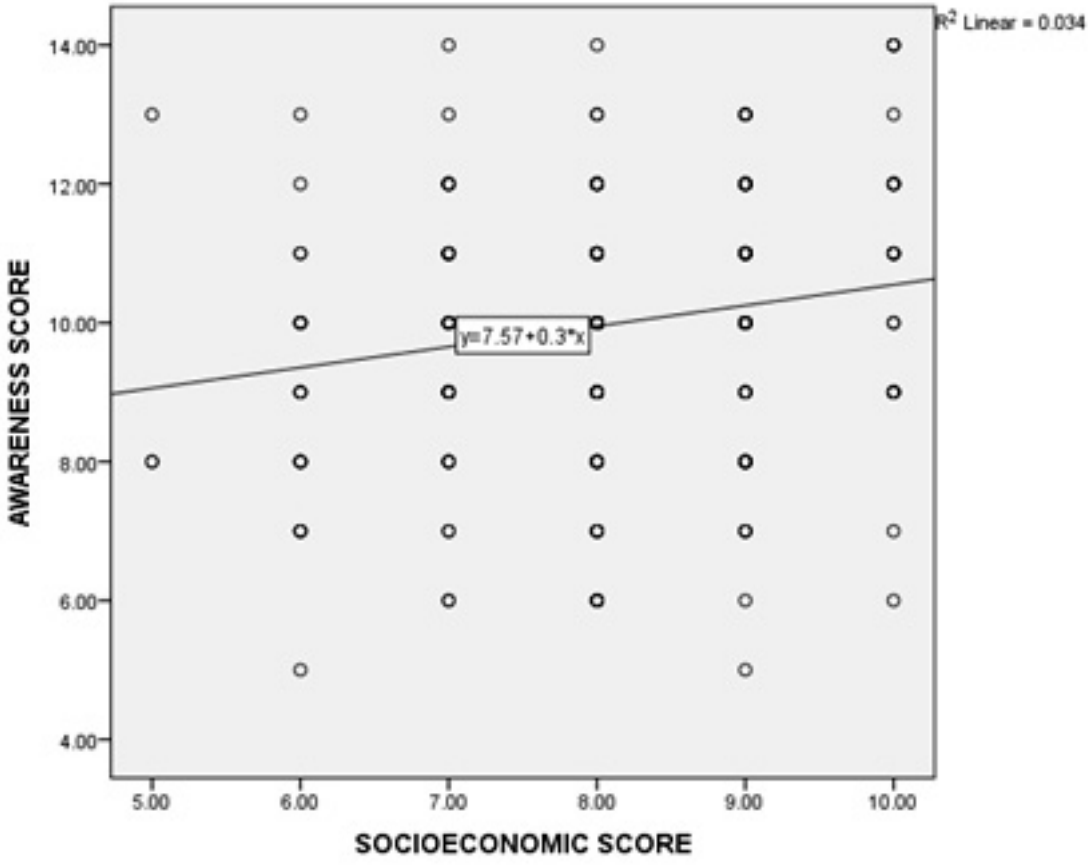
Table 4: Women's awareness of the risk factors and prevention of DVT

			N	%
Risk factors	**Females in the childbearing period**	Yes	153	68.9
		No	69	31.1
	Pregnancy	Yes	142	64.0
		No	79	35.6
	Oral contraceptive pills	Yes	162	73.0
		No	60	27.0
	Puerperium	Yes	130	58.6
		No	91	41.0
	Obesity	Yes	188	84.7
		No	34	15.3
Wrong risk factors	**TB**	Yes	61	27.5
	Diabetes	Yes	117	52.7
	Asthma	Yes	31	14.0
Prevention	**Exercise/walking**		129	84.2
	Drinking water		22	9.9
	Painkillers		3	1.4
	Stocking		10	4.5

Table 5: Comparison between both groups of awareness

		Poor awareness group	Awareness Group	P
Age		37.04±12.88	33.19±11.68	0.049
Socioeconomic level		10 (6-14)	10.5 (6-14)	0.008
Number of births		2.5 (0-11)	2 (0-8)	0.035
College graduate		56.3%	82.8%	0.002
Definition of VTE		75.0%	87.9%	0.038
Identification of VTE risk factors	Females	35.4%	78.2%	0.000
	Pregnancy	22.9%	75.5%	0.000
	Puerperium	18.8%	69.5%	0.000
	Contraceptive pills	47.9%	79.9%	0.000
	Obesity	56.3%	92.5%	0.000
Identifications of complications	VTE is an emergency	58.3%	78.7%	0.015
	Pulmonary complications	37.5%	56.9%	0.030

Figure 1: Correlation between socioeconomic level and awareness (r=0.184, p=0.006)



Discussion

We found an overall good awareness among adult Saudi women living in Jeddah about VTE definition (85%), symptoms (96%), diagnosis (68%), and preventability (84.2%). However, there were serious defects in their knowledge mainly in the consideration of the VTE as a non-emergency situation (23.9%), with no complication (14%), with only (52.3%) of them who considered the possible pulmonary complications. Not all women considered oral contraceptive pills (73%) or the puerperium period (53.6%) as a risk factor. Moreover, they considered other unrelated risk factors like asthma, diabetes, and tuberculosis as important risk factors. Women with poor awareness constituted less than a quarter of the participants (21.6%) and were characterized by being older (p=0.049), with lower socioeconomic levels (p=0.008); mainly education (p=0.002) and more parity (p=0.035) compared to women with good awareness.

In our study, the overall good level of awareness conflicts with the explored serious defects and could be reflected in how deep women's education should be during their childbearing period.

Surprisingly, a substantial number of our participating women had previous exposure to pregnancy (70.4%), labor (39.4%) and abortion (30.9%), so at some time they were counseled and educated about their risk and prevention of VTE.

The overall global public awareness of VTE is reported to be lower than expected despite the serious condition with known morbidity and mortality [11]. Similar to our results, the global poor awareness lay mainly in identifying the major risk factors for VTE including estrogen-containing drugs and in lack of concern of the emergency situation [11]. Our results were much better than another Saudi study [15] which explored the knowledge of 340 pregnant and postpartum patients and found poor knowledge of almost all aspects of the disease, especially preventable factors. Similar to our findings, the same study reported on the positive effect of educational level on awareness.

There are few published data about VTE awareness among Saudi women. Therefore, large epidemiological studies are recommended to further address this important highly preventable topic in other areas in the kingdom especially those areas with advanced maternal age, high parity, low education, and socioeconomic level. Pending the completion of data, there is a tremendous need to improve the health education of Saudi women about childbearing period associated VTE probably through constructing public educational campaigns aiming to improve awareness in order to reduce the burden from this largely preventable disorder. Meanwhile, physicians should pay great attention to educate their pregnant patients about their risk of VTE.

Conclusion

Saudi women from Jeddah aged 22 to 65 demonstrated an acceptable level of awareness about VTE during pregnancy and puerperium with a positive correlation to their socioeconomic level. However, there were serious knowledge deficits and crucial areas in the lack of awareness. Therefore, this study raises the importance to address the topic of VTE among Saudi women with more depth stressing on weak points especially the emergency, the great risk of OCP, puerperium period and lung complications.

More epidemiological data are needed on a national level to support and complete our conclusion. Meanwhile, there should be a national plan for improving the education program for pregnant as well as non-pregnant women. We recommend launching a national VTE Day campaign in Jeddah focusing on pregnancy and puerperium and emphasizing to the public its major risk factors, emergency nature, and preventability. Physicians also should pay more effort to educate their patients during the childbearing period to ensure the delivery of safe and high-quality patient care.

The main limitation of this study was the potentially leading nature of the closed-ended questions of the survey. The second limitation was the non-randomized online sampling technique of participants that could limit the generalization of our results to all Saudi women. Moreover, women with online access are expected to have a higher level of education that could simply explain the overall satisfaction level of their awareness in this study.

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Association of Physicians' Empathy with Adherence to Treatment among diabetic patients at King Fahd Hospital, Medina, KSA

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Abstract

Objectives: To describe the level of physicians' empathy from the point of view of diabetic patients and to investigate the association between physicians' empathy from diabetic patients' perspectives with their adherence to treatment and clinical outcome.

Methods: This is an analytical cross-sectional study conducted at the diabetic center at King Fahad Hospital, Madinah, KSA from November 2017 till August 2018. A total of 214 participants with type 2 diabetes mellitus were enrolled in this study. Physicians' empathy was measured by Consultation and Relational Empathy(CARE) questionnaire and patients' adherence to treatment was assessed using Hemoglobin A1c(HbA1c) level as the clinical outcome. Univariate analysis was carried out to investigate the association between physicians' empathy and adherence to treatment and multivariate analysis was performed to investigate the factors independently associated with adherence to treatment.

Result: There is a statistically significant association between physicians' empathy as perceived by the patients and adherence to treatment as assessed by HbA1c level p= 0.004. Predictors of adherence to treatment were: Physicians' empathy score p=0.049, age p= 0.043, duration of illness p= 0.013 and associated co-morbidities such as eye diseases p=0.0001 and heart diseases p=0.023

Conclusion: Type 2 diabetic patient's adherence to treatment as indicated by their HbA1c level is associated with higher physician empathy as perceived by these patients and with a more controllable diabetic status as indicated by their HbA1c level.

Key words: Adherence, Empathy, Type 2 Diabetes mellitus

Introduction

Empathy is defined as a concept involving two domains, which are cognitive and affective, or emotional domains. The cognitive domain includes the ability of understanding another person's thoughts and feelings regarding an inner experience and the ability to see the outside world from the other person's perspective. The affective domain involves the capacity to enter into the experiences and feelings of another person which allows clinicians to better understand the emotions and perspectives of patients about their health condition(1).

Empathic involvement has a crucial role as it lays the foundation stone for a trusting relationship which when it is formed, constraints in communication will diminish, and this in turn will lead to a more accurate diagnosis and greater compliance, which ultimately will result in better quality of care (2).

The management of chronic illnesses such as diabetes involves a combination of interventional activities including education, nutritional therapy, physical activity, and drug therapy. Due to the multidimensionality and complexity of management and the complications associated with the disease, self-care and adherence to the different aspects of the treatment regimen are challenging (3). Medication non-adherence rate in diabetes has been reported to range from 36% to 93% leading to a poor metabolic control that results in complications including hospitalizations, nephropathy, retinopathy, neuropathy, myocardial infarction, and stroke (4). In diabetes care, empathy was found to be associated with objective measures of disease management such as blood sugar control and fewer complications (5).

A positive correlation between physicians' empathy and clinical outcome in the diabetic patient has been reported. Physicians' accurate understanding of their diabetic patients' beliefs about their illness, as an indicator of empathic understanding, was associated with better self-care among patients, e.g., improved diet and increased blood glucose self-testing (6). Another study reported a significant association between a validated measure of physician empathy which is "the Jefferson Scale of Empathy" and patient outcomes in diabetic patients (hemoglobin A1c (HbA1c) < 7.0%, and Low-density lipoprotein (LDL) cholesterol < 100) (7).

The World Health Organization (WHO) defines adherence to long term medication as "the extent to which a person's behavior corresponds with agreed recommendations from a health care provider (8). It is reported that approximately 50% of chronic patients do not take their medications as prescribed for various reasons (9). Studies suggest that the most effective way to improve patient's adherence to long-term medications is by establishing a good relationship with the patient and by expressing empathy (10).

The current research aims to explore the relationship between physicians' empathy and the adherence to medication among diabetic patients, aiming to reduce the gap in knowledge regarding the effect of empathy on long term adherence to treatment in these patients.

Research objectives

1. To describe the level of physicians' empathy from diabetic patients' perspectives.
2. To determine the frequency of adherence to treatment among diabetics.
3. To explore the association between physicians' empathy from the point of view of diabetics and adherence to treatment among diabetics.

Methodology

Study design:
This is an analytical cross-sectional study.

Study Setting and period:
The study was conducted in Medina, KSA, at the Diabetic Center affiliated to King Fahad hospital over the period November 2017 to August 2018.

A pilot study was conducted prior to the current study and its results were used to calculate the sample size and to modify some questions accordingly.

Study participants and sampling method:
Participants were consecutively selected from the list of patients appointed to the diabetic outpatient clinic of the diabetic center at King Fahad hospital during the period of data collection from 12/3/2018 till 1/4/2018. Inclusion criteria included; patient >18 years old who has confirmed diagnosis of type 2 diabetes mellitus. Exclusion criteria included patients with type 1 diabetes mellitus and those younger than 18 years old.

Abbreviation	Explanation
HbA1c	Hemoglobin A1c
LDL	Low-density lipoprotein
WHO	World Health Organization
CARE	Consultation and Relational Empathy
SPSS	Statistical Package for the Social Sciences
OR	Odds Ratio
CI	Confidence Interval

Sampling size:
Sample size was calculated using OpenEpi for sample size calculation for cross sectional studies (11), hypothesizing good diabetes mellitus control (as evident by a HbA1C level of less than 7), thus considered adequately adherent to treatment, among patients viewing their physicians as empathetic. Patients having a physician's empathy score equal to or higher than the 50th percentile were considered as perceiving their physicians as empathetic. According to the pilot study, 33% of patients who view their physicians as empathetic had good diabetes mellitus control, thus were considered adherent to treatment, compared to only 17% of those who view their physicians as less empathetic, at a 95% confidence interval and 80% statistical power. These inputs yielded a sample size of at least 214 participants to be included in the study (12).

Measurements
Explanatory variables
1. Sociodemographic characteristics: age, sex, residence, marital status
2. Disease-related information: duration of diabetes mellitus type 2 since diagnosis, current treatment, presence of complications, etc.
3. Measurement of physicians' empathy: the Consultation and Relational Empathy (CARE) measurement tool was used to measure physician's empathy from the patient's perspective. It is 10-item self-reported questionnaire assessing empathy of physicians during consultation. Respondents' rating of CARE is done using 5 point scales (0 = doesn't apply, 1= poor, 2= fair, 3= good, 4= very good, 5= excellent). Participants having a CARE empathy score equal to or more than the 50th percentile were considered perceiving their physicians as empathetic while those scoring less than the 50th percentile were considered viewing their physicians as non-empathetic)(13,14). The CARE questionnaire was translated to Arabic and then back translated to English and was revised by a community medicine consultant to ensure its validity.

Outcome measure
The outcome measure is adherence of diabetic patients to treatment. This was assessed using HbA1c (%) level as last recorded in the participants' files. HbA1C was measured using standard laboratory procedures at King Fahad hospital's laboratories. HbA1c is a marker of glucose level in blood during the last 60 to 90 days (15) and is used in this study as an indicator for patient adherence to treatment in agreement with previous international similar studies(7). Participants were classified according to their HbA1C level into 3 categories; Good control (less than 7.0%), moderate control (7-9%), and poor control (more than 9.0%) (16,17,18). For the purpose of statistical analysis, these groups were collapsed into only 2 groups: Not-controlled (HbA1C ≥ 7%) and controlled (HbA1C less than 7%).

Statistical analysis
Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 21(19). Descriptive statistics were displayed as frequencies and percentages for categorical variables. Measures of central tendencies (the median), and measures and dispersion (minimum – maximum) were used to summarize continuous variables, as the continuous variables were not normally distributed when tested by Shapiro-Wilk test. Univariate analysis was performed to investigate the association between the exposure factors (age, sex, occupation, duration of illness and presence of complications and perceived physician empathy score) with the outcome (compliance to treatment as measured by the level of HbA1c). This was performed using Chi-squared test and Mann-Whitney test. Multivariate analysis to investigate factors independently associated with adherence to treatment was performed using binary logistic regression. P value was set at a significance level of < 0.05.

Correlations

A correlation test was done to study the strength and direction of relation between HbA1C level and physician's empathy scoring; the test result showed Pearson's r is -.235 . This means there is **a negative correlation between HbA1C level and physician's empathy scoring (if one variable increased the other variable will decrease**) ; the r value .235 number is slightly close to 1. For this reason, we can conclude that there is a weak relationship between HbA1C level and physician's empathy scoring.

Descriptive statistics

	Mean	Std. Deviation	N
HbA1C	8.431	1.8936	214
Total score	37.7103	9.96803	214

Correlations			
		HbA1C	Total score
HbA1C	Pearson Correlation	1	-.235**
	Sig. (2-tailed)		.001
	N	214	214
Total score	Pearson Correlation	-.235**	1
	Sig. (2-tailed)	.001	
	N	214	214

Results

In this study, the aim was to investigate the association of physician's empathy from diabetic patients' perspectives with patients' adherence to treatment as indicated by their HbA1C level. In total, 214 participants diagnosed with type 2 DM patients were consecutively recruited from the diabetic center outpatient clinics, during the period from 12 \3\2018 to 1\4\2018.

Socio-demographic characteristics, clinical history and physician empathy score of the studied group

Males represented 48.1% of the studied group. Most of the participants were Saudis (93.9%) and living in Medina city (87.9%). The age ranged from 24 years up to 98 years with a median of 60 years. According to marital status of the participants, most of them were married (73.4%) or widowed (13.6%). The majority (81.8%) were diagnosed for a period of ≥ 12 months. As regards treatment, 57.5% were on oral hypoglycemic tablets, 15.9% were on insulin injections and 26.6% were on both. Considering the last HbA1c measurement; 24.3% of patients were considered to be well controlled (HbA1c is less than 7%) 46.3% of patients were moderately controlled (HbA1c is ≥7.0% - ≥9.0%) and 29.4% of patients poorly controlled (HbA1c is >9.0%). The study identified diabetic complications during the last years; eye diseases and hypertension were the most frequent complications at 37.4% and 34.1% of the participants reported them respectively, followed by diabetic foot (17.3%), hyperosmolar hyperglycemic status (14.5%), heart diseases (14%), kidney diseases (9.8%) and hypoglycemic coma (4.7%). The physician empathy score ranged from 16 points up to 50 points with a median score of 40 points. (Table 1).

Physician empathy and factors associated with diabetic patients' adherence to treatment

Table 2 shows a statistically significant association between physician's empathy as perceived by the patients and their adherence to treatment. Patients adherent to treatment had a higher median perceived physician empathy score compared to those who were non-adherent (p= 0.004).

As regards other determinants of adherence to treatment, univariate analysis revealed a statistically significant association between adherence to treatment and a longer disease duration of ≥ 12 months as 88.9 % of patients who were non-adherent to treatment had a disease duration of ≥ 12 months compared to 59.6 % of those who were adherent (p=.000, Odds Ratio(OR) 0.185; 95% Confidence Interval(CI) = .088 - .387). There was also a statistically significant association between some diabetes mellitus co-morbidities and non-adherence to treatment. The frequency of those who reported having eye diseases (p=.000), hypertension (p=.000), diabetic foot (p=.035), reporting at least one attack of hyperosmolar hyperglycemic state (p=.001) as well as having heart disease (p=.004) was significantly higher among the non-adherence to treatment group compared to the adherence to treatment group. Age was not significantly associated with adherence to treatment (p= 0.072) in univariate analysis. Also, there was no statistically significant difference between the 2 comparison groups as regards having kidney diseases (p=0.096) as well as reporting at least one attack of hypoglycemic coma (p=0.280).

Multivariate analysis revealed the variables independently associated with diabetic patients' adherence to treatment. These are presented in Table 3. A higher physician's empathy score (p=0.049 , OR 1.050; 95% CI 1.000 – 1.102), age (p= 0.043 , OR 1.045; 95% CI 1.001 – 1.090), disease duration (p= 0.013 , OR 0.284 ; 95% CI 0.104 - 0.769), eye disease complications (p= 0.000, OR 0.145; 95% CI 0.052 - 0.404) and heart disease (p=.000 , OR 0.145; 95% CI 0.052 - 0.404) significantly contributed to the prediction of adherence to treatment.

Table 1: Socio-demographic and clinical characteristics of the participants

Variables		No. (=214)	%
Sex	Male	103	48.1
	Female	111	51.9
Nationality	Saudi	201	93.9
	Non-Saudi	13	6.1
Residence	Medina	188	87.9
	Outside Medina	26	12.1
Marital status	Single	9	4.2
	Married	157	73.4
	Divorcee	19	8.9
	Widowed	29	13.6
Duration of illness	< 12 months	39	18.2%
	≥ 12 months	175	81.8%
Type of treatment	Oral hypoglycemics	123	57.5%
	Insulin injections	34	15.9%
	Both Insulin injections and oral hypoglycemics	57	26.6%
Diabetic status	Good control	52	24.3%
	Moderate control	99	46.3%
	Poor control	63	29.4%
Diabetes complications and associated co-morbidities	Eye complications	80	37.4%
	Hypertension	73	34.1%
	Diabetic foot	37	17.3%
	Hyperosmolar hyperglycemic state	31	14.5%
	Heart diseases	30	14%
	Kidney diseases	21	9.8%
	Hypoglycemic coma	10	4.7%
		Median	Min-Max
HbA1C		8.0	5.5 – 14.0
Age (in years)		60.0	24.0 – 98.0
Physician empathy score		40.0	16.0 – 50.0

Table 2: Determinants of adherence to treatment among the studied group

Variables	Non-adherent to treatment		Adherent to treatment		P
	N (=162)	%	N (=52)	%	
Male sex	78	48.1	25	48.1	.993
Married	118	72.8	39	75	.759
Resident in Medina	141	87	47	90.4	.520
Duration of illness ≥ 1 year	144	88.9	31	59.6	.000*
Diabetes mellitus co-morbidities					
1. Eye diseases	72	44.4	8	15.4	.000*
2. Hypertension	66	40.7	7	13.5	.000*
3. Diabetic foot	33	20.4	4	7.7	.035*
4. Hyperosmolar Hyperglycemic status	31	19.1	0	0.0	.001*
5. Heart diseases	29	17.9	1	1.9	.004*
6. Kidney diseases	19	11.7	2	3.8	.096
7. Hypoglycemic coma	9	5.6	1	1.9	.280
	Median (Min-Max)		Median (Min -Max)		P
Age (in years)	55.5 (24.0-98.0)		60.0 (39-88.0)		0.072
Physicians' empathy score	37.0 (16.0-50.0)		44.0 (19.0-50.0)		0.004*

Table 3: Factors independently associated with adherence to treatment among the studied group

Variables	P	Exp (B)	95% CI
Physicians' empathy score	.049*	1.050	(1.000 – 1.102)
Age	.043*	1.045	(1.001 – 1.090)
Sex	.989	1.006	(.444 – 2.276)
Married	.236	.680	(.359 – 1.287)
Resident in Medina	.864	.1.127	(287 – 4.420)
Duration of illness	.013*	.284	(.104 - .769)
Heart diseases	.023*	.083	(.010 - .714)
Eye diseases	.0001*	.145	(.052 - .404)
Hypertension	.073	.346	(.109 – 1.102)
Diabetic foot	.563	.670	(.172 – 2.606
Kidney diseases	.990	.988	(.154 – 6.332)
Hypoglycemic coma	.118	.147	(.013 – 1.622)

Discussion

This study investigated the level of physician empathy as perceived by diabetes mellitus type 2 patients and its relation to patient adherence to treatment (measured by HbA1C level). Empathy must be seen as a component of the physician's competence. Hojat et al, 2011 surveyed 535 patients by mail, measuring their overall satisfaction with their primary care physicians. A significant association was found between patient satisfaction and physician empathy with a total score of 0.93 (the total score of the survey ranged from 0.85 to 0.96)(20).

The current study showed a statistically significant association between physician empathy in diabetes management and patient adherence to treatment (p=0.004) and this finding is consistent with a study done by Hojat et al, 2011 that investigated clinical outcomes of diabetic patients in relation to physician's empathy and reported that patients of physicians with low empathy scores were significantly more likely to have higher levels of HbA1c compared to patients of physicians with high empathy scores ($p < .001$) (7). Another study done by Del Canale et al, 2012 in Parma, Italy, studied the relation between physician's empathy score and the possibility of developing long term complications in type 2 diabetic patients and showed that patients treated by physicians with low to moderate empathy scores had a significantly higher rate of developing diabetes complications compared to patients treated by physicians with higher empathy scores ($p< .05$) (5).

In addition to physician empathy, the present study shows that there are other factors independently associated with patient's adherence to treatment such as the participants' age. According to the National Diabetes Statistics Report in 2017, diabetes is an age-related disease where the percentage of adults with diabetes increased with age, reaching a high of 25.2% among those aged 65 years or older in the United States (21). The American Diabetes Association (ADA) has recommended screening all adults for diabetes mellitus beginning at age 45 years, regardless of weight (22). Berkowitz et al, 2013 showed that the age of diagnosis was associated with HbA1c and that a younger age at diagnosis (those <65 years) is associated with a worse subsequent glycemic control level (p value <0.001)(23). Older patients have characteristics that make glycemic control a difficult process. Geloneze et al, 2014 found that both aging and diabetes affect insulin production and sensitivity (24). The duration of illness was one of the factors independently associated with adherence to treatment in the current study. This is in agreement with a study conducted in Stockholm, Sweden, which reported that HbA1c ≥ 6.5 % was associated with the duration of diabetes ($p < 0.001$) and concluded that long disease duration corresponds to the decline and deterioration in β cell function and subsequent increase in HbA1c (26). Hsieh et al, 2014 found that better glycemic control is achievable in those who were diagnosed later in life with short duration of illness ($p < 0.0001$) while earlier age of diabetes diagnosis and long duration are associated with increasing HbA1c ($p < 0.0001$)( ). Also, Unnikrishnan et al, 2017 showed that individuals with young-onset type 2 diabetes mellitus (age at onset 25 years or below) need to be identified early and treated aggressively so as to prevent or delay complications of diabetes (27).

In this current study, non-adherence to treatment was found to be associated with the presence of some diabetic complications. Several studies reported a relationship between poor glycemic control and diabetic complications. Alduraywish et al, 2015 showed that high prevalence of advanced disease complications reflected poor glycemic control (28). Leasher et al, 2016 reported that from 1990 to 2010, around 0.8 million of 3.9 million had visual impairment due to diabetic retinopathy (29). Hayward et al, 2016 conducted a clinical trial including 1791 participants and showed that good glycemic control will improve cardiovascular outcomes (30). Patel et al, 2008 and Turnbull et al, 2009 showed that a high incidence of hypertension is associated with diabetes mellitus (31,32). On the other hand, there is no significant association between nephropathy and diabetic control in the current study contrary to other studies that showed a strong relationship between nephropathy and diabetes control, for example Huang et al, 2011 and Kayar et al, 2017 showed that there is a significant relationship between poor glycemic control and nephropathy (32,33,34). However, this may be attributed to the low prevalence of kidney complications among the studied group.

In a study conducted by Kayar et al, 2017 in Istanbul, Turkey, to estimate the risk factors of poor glycemic control, 757 patients with type 2 DM were followed for 2 years (2013-2015). It was found that marital status had a significant correlation with glycemic control (p value 0.034)(32). Similarly, in Northern Ireland, United Kingdom, a study was done by Berry E et al, 2018 and followed up 75 couples for 12 months and found that marital status contributed to a well-controlled HbA1c (7%) and that this may be due to support that came from a partner which improved disease related distress (35). On the contrary, in the current study, marital status was not related to a well-controlled HbA1C level as an indicator for adherence to treatment ($P= 0.759.$). This difference may be attributed to the long follow-up period in later studies, being prospective studies.

The present study has a design limitation being a cross-sectional one while a longitudinal study design would have been more suitable to establish a causal relationship of physician empathy with HbA1c levels but this was not feasible due to time constraints. On the other hand, the present study's strengths are the 100% response rate by the participants who were approached to share in this study.

Conclusion

The study findings show that type 2 diabetic patient's adherence to treatment as indicated by their HbA1C level is associated with higher physician empathy as perceived by these patients. A higher physician empathy is associated to a more controllable diabetic status as indicated by the HbA1C level and subsequently lower complications. It is recommended to provide healthcare workers with specific training programs on patient communication and effective patient-physician relationship skills to enhance their attitudes and skills concerning empathy with their patients, being an important component of their overall competence. It is also needed to support diabetic patients by awareness programs concerning adherence to treatment and follow-up visits. Physicians' empathy is an area of further research. Replication of this study in multiple hospitals, across different caregiver stuff is recommended, thus putting empathy in the domain of evidence-based medicine.

Recommendation

It is recommended to provide healthcare workers with specific training programs on patient communication and effective patient-physician relationship skills to enhance their attitudes and skills concerning empathy with their patients, being an important part of their overall competence.

It is also needed to support diabetic patients through awareness programs concerning adherence to treatment and the importance of follow-up visits. Physicians' empathy is an area of further research work. Replication of this study in multiple hospitals, across different caregiver stuff is recommended, thus putting empathy in the domain of evidence-based medicine.

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Ethical considerations

Ethical approval was obtained from the research ethical committee at the faculty of medicine, Taibah University prior to conduction of the study. Administrative approvals were obtained from the authorities at King Fahad Hospital. Informed consent was obtained from the participants. All the study procedures conformed with the declaration of Helsinki on ethical principles for medical research involving human subjects( ).

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Awareness of Taibah University Female Students Toward Risks and Safety of Using Oral Isotretinoin for Acne Treatment

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Abstract

Background & Objectives: Isotretinoin is considered to be the most effective medication in treatment of refractory severe acne especially with scarring. In recent years, its application has been extended to those patients with mild to moderate acne despite being associated with many serious side effects. The objective of this study was to assess the awareness of female students in Taibah University, Medina, Saudi Arabia about oral isotretinoin therapy and the adverse events, risks and safety issues related to its use.

Methods: A cross-sectional study was carried out at the female section of both colleges of Medicine and Nursing, Taibah University, Medina, Saudi Arabia, using a self-administered, semi-structured validated questionnaire that included questions on socio-demographic information, knowledge of students about oral isotretinoin therapy and adverse effects, risks, safety issues and precautions related to its use.

Results: Two hundred and twenty-two students (27%) responded to the questionnaire. Dryness was the most well-known side effect (65.3%) followed by hepatic side effects (50%) and teratogenicity (37.3%). Most participants knew that pregnant women, breastfeeding women, women with childbearing potential and children (65.3%, 46%, 30.7% and 30%, respectively) were the most at risk patients for side effects of isotretinoin. Out of those who knew isotretinoin, 78% reported that they do not know the safety issues and precautions.

Interpretation & Conclusions: The total awareness level toward isotretinoin is unsatisfactory among medical and nursing female students, which attracts attention for educational and awareness programs to improve their knowledge.

Key words: Acne, awareness level, female, isotretinoin, risk, safety, Taibah University

Introduction

Acne is a chronic inflammatory disease, which has a significant psychological and social impact. Most cases of acne present with a pleomorphic variety of lesions consisting of comedones, papules, pustules and nodules, and in some cases are accompanied by scarring (1).

The initial event in the development of an acne lesion is abnormal desquamation of the keratinocytes that line the sebaceous follicle and create a microplug or microcomedo. In addition, the increase in circulating androgens at the onset of puberty stimulates the production of sebum into the pilosebaceous unit. These events combine to create an environment within the pilosebaceous unit that is favourable for the colonization of the commensal bacteria, Propionibacterium acnes (2).

Isotretinoin noticeably reduces the production of sebum and shrinks the sebaceous glands. It stabilizes keratinization and prevents comedones from forming and reduces inflammation in moderate to severe inflammatory acne. The exact mechanism of action is unknown; however, it is known that it alters DNA transcription (3).

Isotretinoin is considered to be the most effective medication in the treatment of refractory severe acne cases especially with scarring; however, its use is associated with many serious side effects. One of the most important and significant issues is its teratogenic effect when used during pregnancy (2).

Moreover, isotretinoin use has been associated with psychiatric side effects. There have been a growing number of reported cases of the following side effects: depression, suicide, aggression, psychosis, mood swings, violent behaviour, hostility, bipolar disorder and obsessive-compulsive disorder (5).

Some studies have shown that isotretinoin could affect liver enzymes and lipid levels (3). It may increase serum levels of liver enzymes, triglycerides (TGs) and low-density lipoprotein (LDL) cholesterol and reduce the level of high-density lipoprotein (HDL) cholesterol(6).

Because of all of these significant side effects, patients should be monitored during the course of the treatment to detect these abnormalities before they become clinically significant; however, the frequency of testing varies in clinical practice owing to a lack of consensus (7).

In contrast, multiple prior studies have concluded that only baseline fasting lipid and hepatic panels with one follow-up test are necessary, (8) and one of these studies found that most blood abnormalities occur within the first 2 months of therapy (9).

In recent years, application of isotretinoin has been extended to those patients with mild to moderate forms of acne, especially to those who are responding unsatisfactorily to conventional therapies, hence increasing the likelihood of exposure to birth defects and other disorders.

Isotretinoin is used 90% of the time by people between the ages of 13 and 45 years, (4) and 50% of isotretinoin prescriptions are for women as reported by previous studies (5). There are limited research studies about the awareness of the adverse effects and safety issues in using isotretinoin therapy, especially in Saudi Arabia despite its wide use for acne treatment. Therefore, the aim of the conduction of this study was to highlight and give the overview of this rising issue with the following objective:

To assess the awareness of female students in Taibah University, Medina, Saudi Arabia about oral isotretinoin therapy and the adverse events, risks and safety issues related to its use.

Material and methods

Study design and setting:
A cross-sectional study was carried out at the female section of two colleges (Faculty of Medicine and Faculty of Nursing), Taibah University, Medina, Saudi Arabia.

Study population and study period:
Undergraduate medical and nursing female students in Taibah University during their study period in the academic year 2017-2018 were invited to participate in the study.

Sampling technique and size:
All the undergraduate female students of all years of both the selected colleges were invited to participate in the study.

Data collection tools and procedures:
The data were collected using a self-administered, semi-structured questionnaire developed by the researchers after extensive review of the literature and similar studies, and then distributed to the participants through email through the leader of each year. The questionnaire consisted of four parts:

First part: included questions on socio-demographic information of the participants such as age, residence (e.g. urban or rural), marital status, college (medicine or nursing), class level/year in university etc.
Second part: included questions on knowledge and awareness of students about oral isotretinoin therapy known commercially as Roaccutane/Accutane and the risks and adverse effects related to its use.
Third part: included questions on knowledge and awareness of students toward safety issues and precautions related to the use of isotretinoin.
Fourth part: included questions to be filled in by those who had used or were using isotretinoin at the time of the study to elicit information about the side effects and determine whether they received counselling before its use.

Scoring of knowledge:
Each question was scored 0-1 for awareness. Total score was 26. If the student score was <13, her knowledge was considered unsatisfactory (poor level of awareness), and if her score was ≥13, her knowledge was considered satisfactory (good level of awareness).

Pilot study:
Before the start of the study, the semi-structured questionnaire was pre-tested on 10 students to explore if there was any ambiguity or items leading to misunderstanding in the questionnaire in order to reach its current final form. These 10 students were not included in the main survey.

Validity and reliability of the questionnaire:
The items in the questionnaire were obtained from a number of validated questionnaires, (6, 7,8,9) and validity was completed by reviewing it with 3 experts. The questionnaire was re-administered after a week to the same sample of the pilot study to check test–retest reliability.

Data management:
Data were coded, entered and analysed using the Statistical Package for Social Science (SPSS) version 21.0 (SPSS, Chicago, IL, USA). Quantitative data were represented as the mean and standard deviation, and qualitative data were represented as frequencies and percentages.

Ethical approval:
Official permission was obtained from the Taibah University Scientific Ethical Committee. Informed consent was obtained from all the participants after describing the aim of the study. Privacy and confidentiality were assured.

Funding: Self-funded.

Abbreviations

PEP	**Personal Excellence Pathway**	IL	Illinois
DNA	Deoxyribonucleic acid	USA	United States of America
TGs	Triglycerides	SD	Standard deviation
LDL	Low-density lipoprotein	PPP	Pregnancy Prevention Program
HDL	High-density lipoprotein	FDA	Food and Drug Administration
SPSS	Statistical Package for Social Science	KSA	Kingdom of Saudi Arabia

Results

Table 1: Socio-Demographic Characteristics of the Studied Subjects

	Frequency (n=222)	Percentage (%)
Age (years):	Mean ± SD 22.46 ± 3.71	
College:		
Medicine	126	56.8
Nursing	96	43.2
Academic year:		
First	43	19.4
Second	49	22.1
Third	45	20.3
Fourth	59	26.6
Fifth	26	11.7
Marital status:		
Unmarried	193	86.9
Married	29	13.1
Residence:		
Rural	25	11.3
Urban	197	88.7

The overall number of participants was 222 female students with a response rate of 27% (222/827) from the college of medicine (56.8%) and nursing (43.2%) in Taibah University with a mean (SD) age of 22.46 ± 3.71 years. About 26.6% of the students were from the fourth year, 22.1% from the second year, 20.3% from the third year, 19.4% from the first year and 11.7% from the fifth year. Regarding marital status, 86.9% of the participants were unmarried and 13.1% were married, with the majority (88.7%) living in an urban residence compared to 11.3% living in rural areas (Table 1).

Figure 1: Percentage of Respondents According to Their Knowledge about Isotretinoin Therapy for Acne

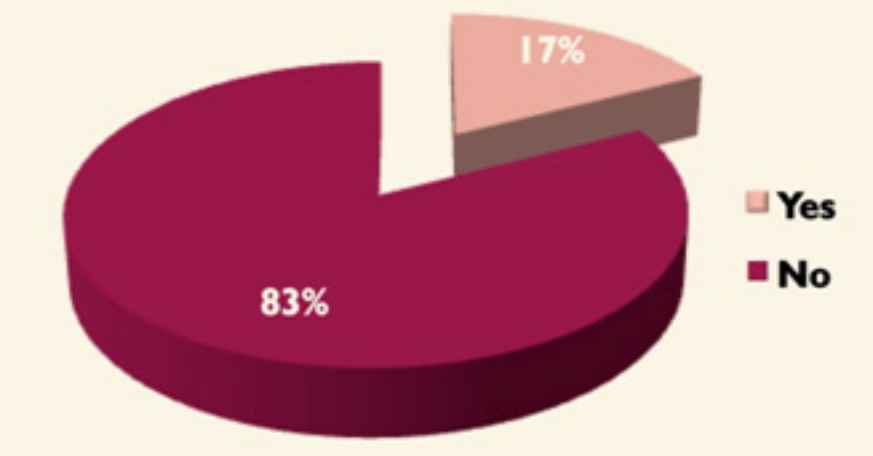
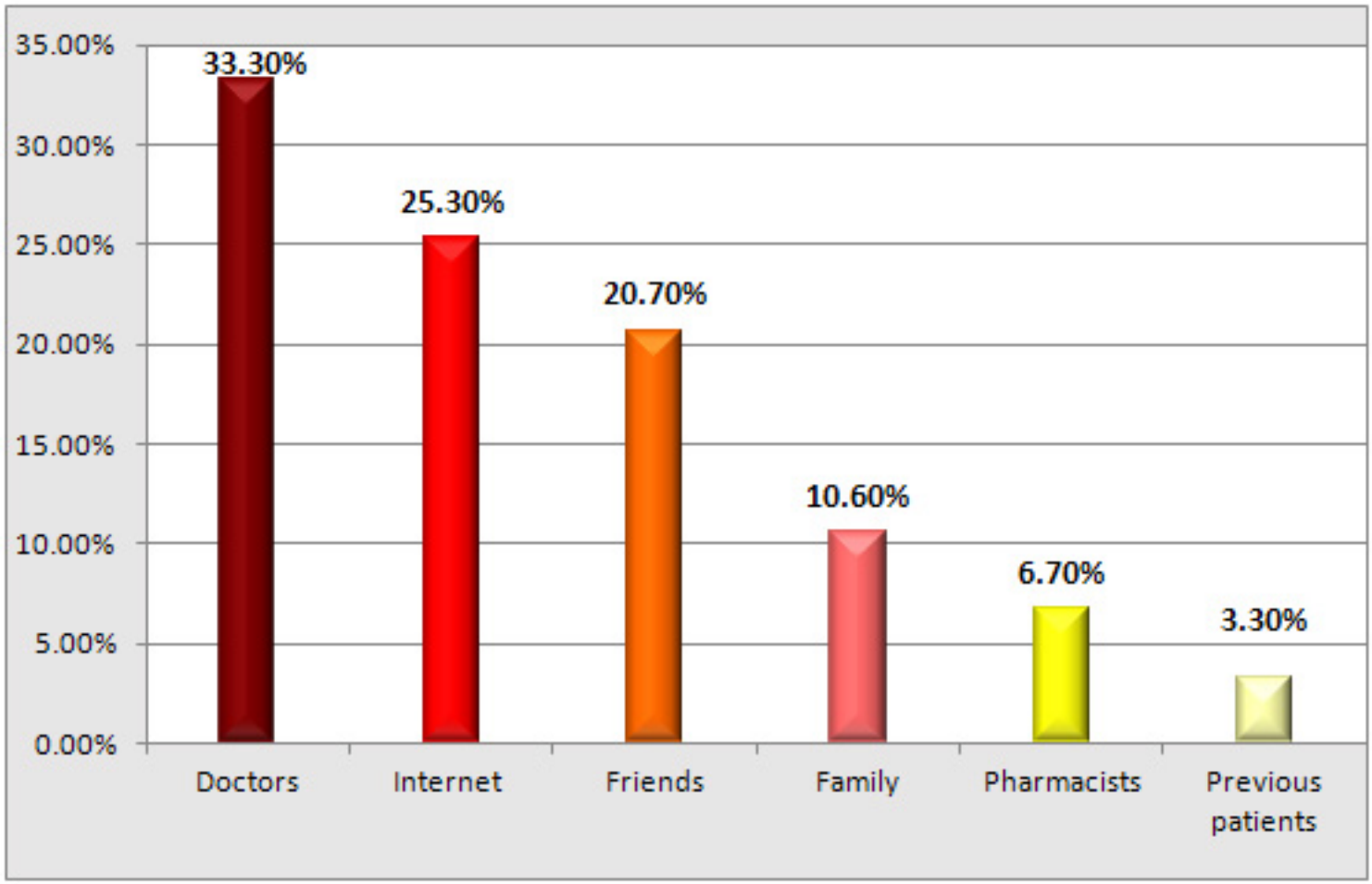


Figure 1 shows that more than half of the female medical students (67.6%) knew about the oral isotretinoin therapy for acne. (n = 150).

Figure 2: Sources of Information of Isotretinoin Therapy for Acne



From those who mentioned that they had information about isotretinoin therapy for acne, their commonest sources of information were from doctors (33.3%) followed by the Internet (25.3%), friends (20.7%), family (10.6%), pharmacists (6.7%) and previous acne patients (3.3%), as shown in Figure 2.

Table 2: Knowledge about Side Effects of Isotretinoin and at risk Patients

	Frequency (n=150)	Percentage (%)
What are the risks and side effects of using oral isotretinoin drug?		
Teratogenicity		
Know	56	37.3
Don't know	94	62.7
Dryness		
Know	98	65.3
Don't know	52	34.7
Constipation		
Know	40	26.7
Don't know	110	73.3
Lipid profile disturbance		
Know	45	30.0
Don't know	105	70.0
Hepatic side effect		
Know	75	50.0
Don't know	75	50.0
Depression		
Know	45	30.0
Don't know	105	70.0
Anaemia		
Know	11	7.30
Don't know	139	92.7
Back ache, bone pain and arthralgia		
Know	2	1.30
Don't know	148	98.7
Who are the at-risk patient groups for using isotretinoin?		
Pregnant women		
Know	98	65.3
Don't know	52	34.7
Breastfeeding women		
Know	69	46.0
Don't know	81	54.0
Women with childbearing potential		
Know	46	30.7
Don't know	104	69.3
Children		
Know	45	30.0
Don't know	105	70.0
Elderly		
Know	17	11.3
Don't know	133	88.7
Adults		
Know	3	2.00
Don't know	147	98.0

Regarding awareness level of participants about the side effects of isotretinoin and at risk patients, dryness was the most well-known side effect (65.3%) followed by hepatic side effects (50%) and teratogenicity (37.3%). Most of the participants knew that pregnant women, breastfeeding women, women with childbearing potential and children (65.3%, 46%, 30.7% and 30%, respectively) were the most at risk patients for side effects of isotretinoin, as shown in Table 2.

Table 3: Awareness of Safety Issues and Precautions for Using Oral Isotretinoin

	Frequency (n=150)	Percentage (%)
Use of contraception for married women		
Know	55	36.7
Don't know	95	63.3
Regular specific investigation for follow-up		
Know	80	53.3
Don't know	70	46.7
Avoid exposure to sunlight and use of sun protection		
Know	68	45.3
Don't know	82	54.7
Avoid taking drugs without medical counselling		
Know	54	36.0
Don't know	96	64.0
Avoid blood donation during therapy		
Know	25	16.7
Don't know	125	83.3
Avoid laser treatments for a period of 1 year		
Know	39	26.0
Don't know	111	74.0
Contraindicated in patients allergic to peanuts or soya		
Know	14	9.33
Don't know	136	90.7
Not to take vitamin supplements containing Vitamin A during oral isotretinoin therapy		
Know	20	13.3
Don't know	130	86.7

Table 3 shows that out of those who knew the drug, 78% reported that they did not know the safety issues and precautions for using oral isotretinoin. Meanwhile, regular specific investigation for follow-up, avoiding exposure to sunlight, use of contraception for married women and avoid taking drugs without medical counselling were the known safety issues and precautions by most of the participants (53.3%, 45.3%, 36.7% and 36%, respectively).

One hundred and three students (68.7%) out of those who knew the drug mentioned that they did not know of the required regular investigations during treatment with isotretinoin, while liver function tests, kidney function tests, lipid profiles, complete blood count and pregnancy test were known as the required regular investigations during treatment with isotretinoin by most of the participants (65.3%, 42.7%, 36.7%, 41.3% and 36%, respectively), as shown in Table 4.

Figure 3 shows that more than half of the female medical students (62.16%) did not use oral isotretinoin, while 37.84% of participants were using oral isotretinoin.

Forty-seven (56.0%) of the current students who used oral isotretinoin therapy for acne received counselling before they started using the drug, while 27 students (32.1%) developed sides effects during the use of oral isotretinoin therapy, as shown in Table 5.

Figure 4 shows the total awareness level of female students in Taibah University, Medina, Saudi Arabia toward oral isotretinoin therapy and the adverse events, risks and safety issues related to its use. The majority of the participants (84.7%) had an unsatisfactory level of awareness compared to 15.3% who had satisfactory awareness level.

Table 4: Awareness of the Required Regular Investigations During Treatment With Isotretinoin

	Frequency (n=150)	Percentage (%)
Liver function tests		
Know	98	65.3
Don't Know	52	34.7
Kidney function tests		
Know	64	42.7
Don't Know	86	57.3
Lipid profiles		
Know	55	36.7
Don't Know	95	63.3
Complete blood count		
Know	62	41.3
Don't Know	88	58.7
Pregnancy test		
Know	54	36.0
Don't Know	96	64.0

Figure 3: Usage Percent of Isotretinoin Drug Between Participants

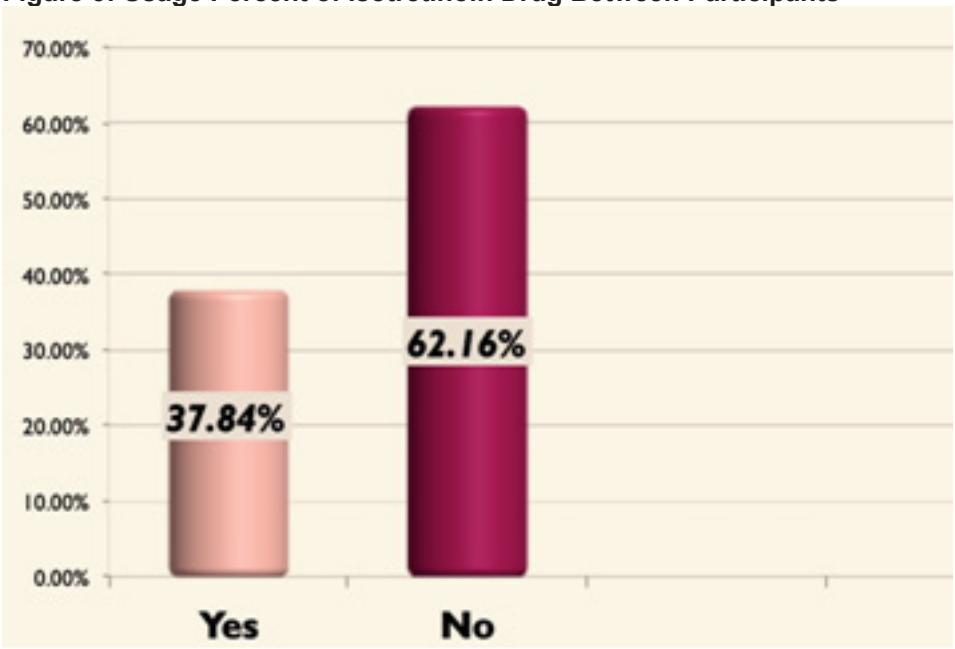
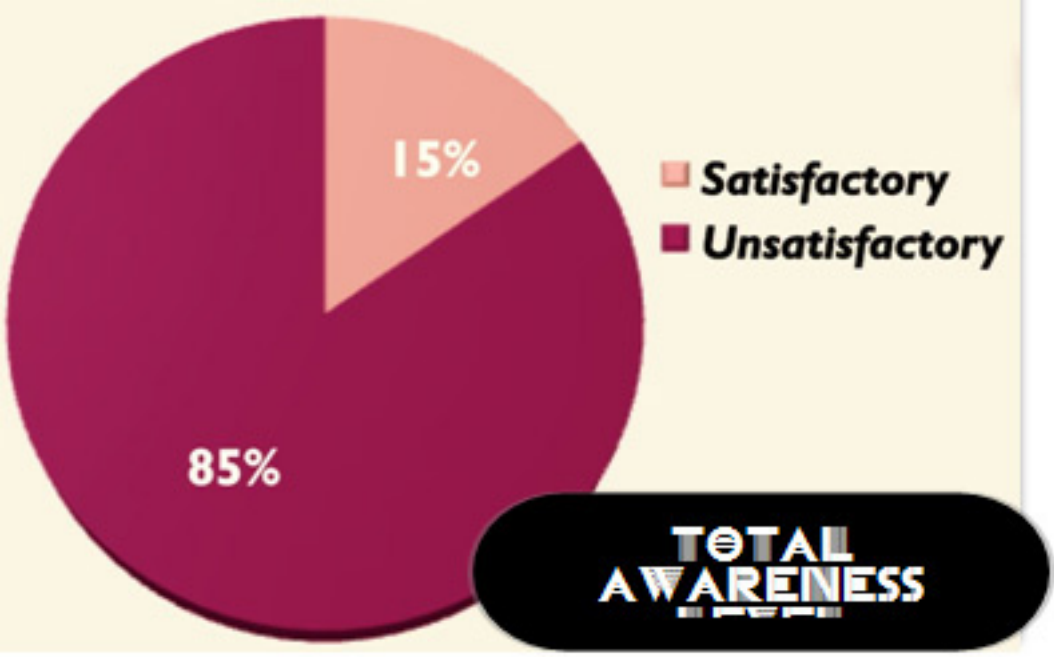


Table 5:Drug Experience of Current Students Using Oral Isotretinoin Therapy

	Frequency (n=84)	Percentage (%)
Did you receive any counselling before you started using oral isotretinoin therapy?		
Yes	47	56.0
No	37	44.0
Did you develop any side effects during its use?		
Yes	27	32.1
No	57	67.9

Figure 4: Total Awareness Toward Oral Isotretinoin Therapy for Acne Among Participants



Discussion

Isotretinoin, known commercially as Roaccutane/Accutane is an effective medication for the treatment of severe recalcitrant acne. Although many people know or even use isotretinoin drug, some of them do not have enough information about this drug. Others may even fear using this drug because of the lack of accurate information about the drug. (10) Previous research studies have shown that good knowledge and awareness about the drug increases the compliance and decreases the side effects(10).

This was the first study in Taibah University, Medina, Saudi Arabia, which aimed to assess the awareness of female students about oral isotretinoin therapy. The present study shows that more than half of the female medical students (67.6 %) had some information about the oral isotretinoin therapy for acne, and their major sources of information were from doctors, which is consistent with a study conducted by Al-Harbi, 2010 at Qassim region, (10) which clarifies the role of the doctors as providers of health education.

Dryness was one of the most well-known side effects in our study (65.3%) followed by hepatic side effects (50%) and teratogenicity (37.3%). This result is in agreement with that of similar previous studies that have shown dryness of lips, eyes and skin as the most common side effect among patients who used isotretinoin, (11) indicating the importance of educating patients about the drug side effect and the ways to reduce this side effect.

The regulatory authority in each country has approved a Pregnancy Prevention Program (PPP), which consists of advice on education, therapy management and control of distribution of the drug(12). According to this program, women of childbearing potential should use at least one method of effective contraception, preferably two forms, starting one month before and finishing one month after the course of isotretinoin treatment(13). In order to achieve safety and risk reduction of isotretinoin therapy, a program was created in 2006 by the United States Food and Drug Administration (FDA) and directed at women of childbearing potential. This program states that isotretinoin drug can be prescribed only to those female patients who meet the program criteria for pregnancy prevention before and during the use of isotretinoin drug(14, 15). In agreement with these precautions, most of our participants were aware that pregnant women, breastfeeding women, women with childbearing potential and children (65.3%, 46%, 30.7% and 30%, respectively) were the most at risk patients for side effects of isotretinoin. Similarly, a study done by Lammer et al.(16) has shown that there was 25-fold increased risk of birth defect among babies of women who were exposed to isotretinoin during pregnancy than those who were not exposed to isotretinoin during pregnancy. Another study done by Lewicka et al.(13) has shown that the majority of women (94.2%) were aware of the risk of serious foetal malformation during isotretinoin treatment and (39.3%) was instructed to perform a pregnancy test at home before isotretinoin administration, which highlights the importance of proper counselling about pregnancy prevention programs in minimizing birth defects among women of childbearing age in the course of treatment.

There are many issues and precautions that should be taken when using oral isotretinoin. This study mentions that nearly half of the participants (45.33%) were aware about the importance of avoiding exposure to sunlight while they were on treatment and using sun protection, while few of our participants knew about the need to avoid blood donation and taking Vitamin A during therapy. In addition, only 9.33% knew that this drug is contraindicated in patients allergic to peanuts or soya.

Indeed, isotretinoin may increase the sensitivity of the skin to light, so the use of sun protection is important during treatment. Several studies have reported that people who use isotretinoin therapy should avoid blood donation while taking the drug and 1 month after, as it is a teratogenic drug and may cause birth defects if given to a pregnant woman (17,18). In addition, previous reports have demonstrated that supplements containing Vitamin A should not be used with isotretinoin to avoid additive toxic effects (12).

Cosmetic procedures such as waxing and laser can increase the chance of scarring if used during the period of treatment. However, there is insufficient evidence to justify delaying cosmetic procedures such as waxing and laser for patients currently or recently using isotretinoin(4). Those patients who have allergy to soya and peanuts should inform their doctor and pharmacist before starting the treatment because isotretinoin contains soya oil. However, in 2015, N.M.K. et al. reported that he had treated six patients with known severe peanut allergies with isotretinoin without any anaphylactic reaction(19).

As regards the required investigation during oral isotretinoin therapy, our results show that 68.7% of the participants had no idea about the required investigation. Meanwhile, those who had some information on the required investigation mentioned that liver function tests, kidney function tests and complete blood count are the top priority investigations, followed by lipid profiles and pregnancy test. A previous study conducted by Rao et al.(20) has shown an increase in the level of liver enzymes, total cholesterol and serum triglycerides in 6% of participants, while there was no change in white blood cells count, haemoglobin level and platelet count. More attention should be paid to educate patients who will start isotretinoin therapy, about the importance of measuring lipid profiles, liver function tests and full blood count before starting the treatment and after 1 month of its initiation, repeating these investigations every 3 months(12).

In the present study, the awareness about the importance of pregnancy test before and during isotretinoin was 36.0%, which is low compared to its risk. Isotretinoin is a teratogenic drug as shown in a review conducted by Layton, 2009, which reported that 50% of pregnancies that were exposed to isotretinoin spontaneously abort and about 25% were born with cardiovascular or skeletal deformities (12), which indicates the need for performing pregnancy test before, during and after a course of therapy and providing advice on contraception.

In a study done by Al-Harbi, 2010, 21.1% of students were using oral isotretinoin therapy, and 63.7% of them complained of side effects that interfered with their daily activities (10). In the present study, 37.8% of the participants were using oral isotretinoin, and 32.1% of them developed side effects related to the drug. Differences between both studies might be attributed to a different sample size and the subjects involved, as the study conducted in Qassim region was made on both male and female students, while our study was conducted only among female students.

Concerning the total level of awareness, the majority of the participants (84.7%) in the present study had insufficient knowledge and a poor level of awareness compared to 15.3% who had adequate knowledge and good awareness level, which is lower than that reported in the previous study (10). This difference in the level of awareness about isotretinoin drug might be related to the lack of health education concept among dermatologists in Medina, where the main source of information in the study was doctors. The other possible reason is that health education programs about this commonly used drug were done previously in Qassim region. Therefore, these findings indicate the need for devoting more time to educate patients about the ways to avoid and deal with the side effects of isotretinoin, concentrating on the explanation of common side effects, appropriate methods, and frequency of moisturization, safety rules and precautions during the use of oral isotretinoin therapy.

It should be emphasized that the main limitation of this study was the low level of response among participants and that the collected data were self-re¬ported, with consequent risk of bias and inaccuracy. Furthermore, as it was not a community-based but a cross-sectional study conducted only at the female section of two colleges of Taibah University, This study cannot firmly establish causal relations, and the results may not be generalized to the rest of the university students.

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Conflict of Interests
The authors declare that they have no conflict of interests.

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Appendix A

QUESTIONNAIRE

Awareness of Taibah University female students toward risks and safety of using oral isotretinoin for acne treatment

We are medical students at Taibah University; this questionnaire includes questions that will help us to determine the level of awareness toward oral isotretinoin named as Roaccutane (Roche Pharma AG, Germany) /Accutane (Roche Laboratories, United State) for acne treatment among students at Taibah University. Please help us by filling in this questionnaire; your name will not appear in the research. This study is only for scientific research. Your filling confirms agreement for participation.

I- Socio-demographic information:

- Age: ……. (years)
- College: □Medicine □Nursing
- Marital status: □ Married □ Unmarried
- Study year:

□ First year □Second year □ Third year □ Fourth year □Fifth year

- Residence: □ Urban □ Rural

II- Awareness of oral isotretinoin therapy (named as Roaccutane/Accutane) and the risks and adverse effects related to its use

1. Do you know oral isotretinoin drug (Roaccutane/ Accutane)?

□ Yes
□ No

If yes,

2. What is your source of information?

□ Doctors
□ Pervious patient
□ Friends
□ The family
□ Internet
□ Newspaper
□ Pharmacist
□ Others ……

3. Do you know the risks and side effects of using oral isotretinoin drug?

□ Yes
□ No

If yes,

4. What risks and adverse effects do you know of oral isotretinoin therapy? (You can choose more than one answer):

□ Teratogenicity
□ Dryness
□ Constipation
□ Lipid profile disturbance
□ Hepatic side effects
□ Depression
□ Anaemia
□ Others …….

5. Who are at-risk patient group for using isotretinoin?

□ Pregnant women
□ Breastfeeding women
□ Women with childbearing potential
□ Children
□ Elderly people
□ Adults

III- Awareness of safety issues and precautions for usage of oral isotretinoin therapy.

(You can choose more than one answer):

6. What are the safety issues and precautions for using Roaccutane/Accutane (oral isotretinoin)?

□ Use of contraception among married women during oral isotretinoin therapy
□ Regular specific investigations for follow-up
□ Avoid exposure to sunlight and use of sun protection product while using oral isotretinoin drug
□ Avoid taking other drug/herbal medications without medical counselling
□ Avoid blood donation during oral isotretinoin therapy
□ Avoid laser treatments for a period of 1 year following the end of treatment
□ Contraindicated in patients allergic to peanuts or soya
□ Not to take vitamin supplements containing Vitamin A during oral isotretinoin therapy
□ Others …….

7. What are the investigations that should be done regularly during treatment with isotretinoin?

□ Liver function tests
□ Kidney function tests
□ Lipid profiles
□ Complete blood count (CBC)
□ Pregnancy test

IV- Additional questions to be filled by those who used or are currently using isotretinoin

8. Did you use oral isotretinoin known as Roaccutane/ Accutane before or are you currently using it?

□ Yes
□ No

a. If yes, who prescribed it?

1- Physician ( )
2- Took it by yourself ( )

b. For how long did you use it? ……

9. Did you receive any counselling before you started using oral isotretinoin therapy?

□ Yes
□ No

10. Did you develop any side effects during its use?

□ Yes
□ No

If yes: what is it?.....

El-Gamal, F et al, explored clinical patterns and risk factors of Acute Coronary Syndrome (ACS). A great proportion of the patients with ACS had an age range of 46 – 59 years (47.3%), and 28.2% were younger than 46 years old. Among the cases of ACS, S-T elevation myocardial infarction (STEMI) was 23.7%, non- S-T elevation myocardial infarction (NSTEMI) was 29.5% and unstable angina (UA) was 46.8%. Chest pain (82.7%), and shortness of breath (24.7%) were the most common complaints among patients with ACS. In agreement with a recent study, the present study didn't find hypercholesterolemia as a significant risk factor for ACS after allowing for possible risk factors.

In two papers the issue of urinary stone were dealt with. Qattan , M.M et al, assessed the use of extracorporeal shockwave lithotripsy (ESWL) in the management of renal stones in relation to different sizes and locations of the stone. They followed a retrospective cohort study between 2014 and 2018 carried out by obtaining data from electronic health records and patients files for all patients who had ESWL in King Abdulaziz Medical City, Jeddah. They found thatthe overall success rate of ESWL was 41.13%, out of 45 subjects who had ureteric stones, 18 (35.29%) subjects had a successful ESWL. Where as a retrospective study of all children with bladder stones seen and treated at Alsaidi private hospital in Aden. A total of 62 children were diagnosed with bladder stone and were (83.9%) males and (16.1%) females. The authors concluded that the majority of affected children were males and were from rural areas. Also, the majority were less than 6 years old. The treatment procedures were cystolitholapaxy followed by cystolithotomy.

Bifari I et al, carried a cross-sectional study using a pre-tested and validated questionnaire. The study was done in a private shopping mall at Taif city, Saudi Arabia during the month of October, 2018 after obtaining ethical clearance. We included responses of 431 participants for our analysis.. The authors concluded that the use of TEM and self medications for eye problems in Saudi Arabia is not uncommon. Even though most of the participants are aware of the harmful effects of some of the Traditional medicaments, there is a need to raise the knowledge and awareness regarding use of TEM and self medicaments for eye problems.

Thawabeh A.N et al, presented a case of non-keratinizing undifferentiation nasopharyngeal cancer who had cisplatin chemotherapy. They presented a 56 years old male admitted to Al-Hada emergency department complaining of diffuse severe abdominal pain associated with nausea at the onset of the pain and constipation one day ago. In this study, thromboembolic events (TEEs) occurred within the first 100 days of starting cisplatin. TEE prophylaxis is advisable for patients receiving cisplatin-based chemotherapy.

Helvaci M.R et al tried to understand the safest upper limit of triglycerides in the plasma. The authors concluded that Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD were all deteriorated parallel to the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Interestingly, the greatest number of deteriorations was observed just above the plasma triglycerides value of 60 mg/dL.

Khan M et al, performed an observational cross-sectional study on 400 healthcare workers in health care facilities in Saudi Arabia. The aim of the study is do assessment of the knowledge and compliance of healthcare workers among safety precautions in health care facilities. The tool used in this study was self-administrated questionnaire divided into three sectors: (1) socio demographic, (2) knowledge about concept of standard precautions, its measures and when used, (3) Practice of standard precautions. The authors concluded that more than half of our participants had sufficient knowledge and practice regarding standard precautions.

Alkhayat, M.A et al, aimed to assess the satisfaction of patients who have undergone bariatric surgery in the city of Taif. The authors follow an online survey using a Post-Bariatric Satisfaction Questionnaire was used to collect responses from patients. The authors concluded that satisfaction from bariatric surgery was not only effective in a reduction in weight loss but also has found to affect in reducing co-morbidities which drastically improved the quality of life. Patients should be made aware of the benefits and the limitations of these types of surgeries in morbid obesity management.

Jajah, M.B et al, carried cross-sectional observational study on 347 type 2 diabetic patients who were using the drug 'metformin' for at least six months. The study aimed to assess the prevalence of vitamin B12 deficiency in patients with Type 2 diabetes mellitus (T2DM) on metformin. The prevalence of vitamin B12 deficiency among participants was 10.4%. Patients with borderline levels were about 20.2% and remaining 69.5% had normal vitamin B12 levels. The authors concluded that vitamin B12 supplementation should be prescribed for diabetic patients to prevent the occurrence of vitamin B12 deficiency complications.

Bossei A et al, conducted a cross-sectional survey to determine the prevalence of De-Quervain's tenosynovitis and its relationship to the frequency of cell phone usage among medical professionals. Participant sample size was 354 students, selected through convenience sampling. The Finkelstein test showed positive results (67%, n=238) when done on students. The authors concluded that De-Quervain's tenosynovitis is a critical cause of hand dysfunction for health care providers. Further awareness will help researchers develop an educational program for mobile texting and recommend suitable behavioral variations for avoiding this under-documented cause of tendinopathy.

Murshid S.J et al, carried an an analytic cross-sectional study of 83 post-cardiac surgery Saudi patients looking at the quality of life. The authors concluded that post-cardiac surgery Saudi patients had an accepted HRQoL months after their surgery that could deteriorate later with their advancing age. They recommend paying more attention to those with old age and /or comorbidities who will undergo cardiac surgery in order to improve their long lasting HRQoL.

Awaji R.M.H et al conducted a descriptive cross sectional study in three private hospitals in Jeddah. The aim to evaluate the pharmacotherapy for children with autism spectrum disorder in Jeddah. The authors concluded that nowadays management of autism depends on combination between behavioral management, pharmacotherapy, family and educational therapy for best outcome. The most common pharmacological line used was SSRIs and kebra and about (75%) of children who took drugs complained of side effects.

A study from Ayman Abdelbaky et al, Saudi Arabia evaluated the prevalence of use of dietary supplement and hormones among male gym attendees in Taid City, and to assess participants' knowledge and attitude towards them.

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