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Mobile Phone Addiction and its Relationship to Sleep Quality among the General Population in Abha City, Saudi Arabia .... page 82

Education and Training

Case Report

Medicine and Society

Editorial

In this issue there are various papers from a number of authors from the region in addition Beasley J and Pocock L provide a restrospective on the life of Dr Manzoor Butt a family doctor from Rawalpindi, Pakistan whose life's work extends far beyond the confines of his surgery and out into the community where he has initiated so many projects that provide aspects of health, safety and poverty appeasement in the local community.

Sarhan , M.D., et al, did a cross-sectional study that included 112 nocturnal enuresis patients aged between 5 to 14 years of both sexes in the Child Psychiatry Clinic at Cairo University Hospital. Social data were collected for the studied children and the parents' attitude towards the problem of nocturnal enuresis. The aim of the study is to identify the risk factors and pattern of nocturnal enuresis in the Child Psychiatry Clinic of the Center of Social and Preventive Medicine. The mean age of the patients was found to be 8.6 ± 2.6. The average number of dry nights per week was 1.8. Medicines were used by only 24% of patients. It was also observed that 47% of patients suffered from punishment. Twenty-five percent complained of constipation. Two-thirds of the patients had a positive family history. Learning problems and attention deficit disorder were present in 14 and 12%, respectively. The authors concluded that nocturnal enuresis is a common problem that is affected by many risk factors, especially constipation, parental punishment, and drinking liquids after dinner. It turns out that very few patients have learning problems.

Mass N et al., looked at the the risk factors, clinical features, and treatment outcomes of Male Breast Cancer MBC patients in Saudi Arabia. The authors followed a retrospective-cohort study using consecutive sampling, all male patients who were diagnosed with breast cancer based on the pathology results that were collected from the medical records from January 1998 to December 2017 and treated in Princess Nora Oncology Center. A descriptive statistic was used to find the minimum, maximum, and mean of age at the time of diagnosis. On the other hand, frequencies and percentages were utilized to summarize all other clinical features of the patients including the pathological type, stage at time of diagnosis, metastasis, risk factors, performance status, treatments, and relapse. The mean age of all the 15 patients was 58 +/- 16.5 SD at the time of diagnosis, whereas the maximum was 91 and the minimum was 36. The most predominant type of male breast cancer was Invasive Ductal Carcinoma IDC, which affected 14 patients out of 15 (93.3%).

Alotaibi G.N et al, used a cross-sectional study to investigate the prevalence of burnout and its associated risk factors among female medical students in Taif University. The prevalence of burnout was about 23% of 213 participants. With 27% reporting high levels of EE, 62.4% had high level of DP and a low level of PA was (8.9%). The authors concluded that Year of study, study hours, leisure time activities and exercise are factors influenced burnout among female medical students in Taif, KSA. Effective coping strategies should be considered to minimize burnout levels. Simple methods such as increased physical activity, leisure time activities and group discussion may reduce the likelihood of the development of burnout.

Basharat , V et al., did a A descriptive cross sectional survey to estimate the prevalence and correlates of IBS among teachers in Abha city. The research included 578 teachers, 55.9% of them were females and 75.6% were married. IBS was recorded among 35.5% of the teachers. IBS was more recorded among females than males. Logistic regression model included all teachers' demographic and work data among which gender, income, chronic health problems, and work load were found to be statistically significant predictors for IBS status. The authors concluded that about one third of the teachers had IBS. IBS subtype M was the most frequent especially among females with high income and high work load.

Alshehri , M.H et al., did a cross-sectional study recruited a total of 281 Saudi students of both genders at the college of medicine of IMSIU-Riyadh, from the preparatory year to the fifth year. The aim of this study is to measure the knowledge and attitude towards BLS among medical students. A total of 280 students completed the questionnaire. Males constituted the majority of participation (57.1%). The overall mean score for BLS knowledge was very poor (29.96%, SD±14.67). In addition, 40% of students had never received BLS training before. It was also noted that about 76% of students desired more BLS training and about 78% of them thought BLS training should be mandatory. The outcome indicates very poor knowledge of BLS among medical students of IMSIU, which mandates more BLS training. Despite the numerous students' failure to show acceptable knowledge on BLS training, a good attitude is observed. These findings encourage more improvement in BLS education among IMSIU students to guarantee better outcomes during emergency situations.

Asiri, A et al., did a nationwide study that included 1218 adults living in Saudi Arabia. A study questionnaire was designed for online data collection using the "Google Forms". The aim is to assess knowledge of the population in Saudi Arabia about health hazards affecting the offspring of fathers with advanced age at the time of conception. Almost half of participants were males (49.4%), age of 60.3% was 20-40 years, 22.2% were working in the health sector, while 34.4% were working in other sectors. The authors concluded that the public in Saudi Arabia mostly have poor knowledge about impact of advanced paternal age on offspring's health. Most of them feel the need to raise their awareness about offspring's health problems associated with father's ageing. It is recommended to raise their awareness regarding the fact fathers, mostly after the age of 40 years, experience decreased fertility, and constitute a high risk for congenital malformations among their offspring. Couples must be counselled on the impact of advanced paternal and maternal ages on negative pregnancy outcomes and impaired offspring health.

Mustafa A.E.M et al., did a descriptive cross-sectional survey targeting all mothers in Aseer region. The aim is to assess mother's awareness regarding weaning practices and its determinants among Mothers in Aseer reign, southern of Saudi Arabia.The survey included 803 responding mothers whose ages ranged from 20 to 55 years with mean age of 30.6 ± 10.2 years old. University level of education was recorded for 516 mothers (64.3%). Exact of 174 mothers (18.3%) reported that infant food should be breast milk only till the age of 4 months. The authors concluded that the study revealed that mothers in Aseer region had poor knowledge regarding weaning and weaning practice especially effect of delayed weaning. Their main source of information based on their personal experience. More effort should be paid to improve mother's awareness and practice regarding breast feeding and weaning.

Al Saleh, M.M et al., did a : A population based cross-sectional survey targeting general population in Aseer region, southern of Saudi Arabia. The aim was to assess knowledge, attitudes, and practices concerning self-medication with antibiotics among the public in Aseer region, Saudi Arabia. A total of 843 participants completed the study questionnaire. Exact of 796 (94.4%) of the respondent reported that Antibiotics should be purchased according to a doctor's prescription, 450 (89%) correctly said that Antibiotics have side effects, and sometimes are dangerous. The authors concluded that population in Aseer region had poor knowledge regarding antibiotic use in total. Also, participants practice was questionable and need to be improved to adhere to safe practices with antibiotic use.

A number of papers discussed educational issue and training. AL-Shahrani, A. et al., did a descriptive cross-sectional study targeting all medical interns in all accessible hospitals. The questionnaire covered the interns' socio-demographic data, work-related data, and preferred speciality besides preferred workplace and worktime. The study included 80 medical interns of which 30 males and 50 females. As for marital status, 73.3% of the male interns were married compared to 24% of the females with statiscal significance (P=.001). the authors claims that the current study revealed that there were gender differences regarding future workplace (especially high responsibility positions) and work time specifically for those who had children especially for female interns. Besides, males showed bimodal occupational self-efficiency expectations while female interns were at moderate level. Alqahtani A.M.A. et al.,

Followed a cross-sectional design, this study out at 25 PHCCs in, Saudi Arabia. The study comprised 25 PHCCs managers and 300 PHC providers. Survey instruments included a brief sociodemographic survey questionnaire, the "Multifactor Leadership Questionnaire. The study aimed to explore the relationship between managers' leadership styles and job satisfaction among healthcare workers in primary healthcare centers (PHCCs). Only 52% of PHCC mangers attended training on leadership, 68% highly followed transformational leadership facet "idealized influence", and 64% followed "management-by-exception", while only 28% highly followed the "Laissez-faire" leadership style. About one-third of healthcare providers were satisfied, 9.3% were dissatisfied, while 51.3% were ambivalent. The authors concluded that job satisfaction is significantly less among pharmacists, those having insufficient income, or less experience in PHC. Laissez-faire leadership significantly correlates with most job satisfaction items, followed by transactional and transformational leaderships. It is necessary to improve PHC providers' job satisfaction by better application of transformational and transactional leadership styles. Ashfaq T et al., did a mixed methodology to determine the family physicians' change in knowledge due to sitting the MRCGP [INT] and its impact on their attitudes and practice in Pakistan. The study was conducted in two phases. In phase 1, 65 doctors who had passed MRCGP [INT] were interviewed and a focus group was also held to assess the FPs/GPs perceptions. In phase II, patients were interviewed regarding the practice of the FPs/GPs. A pre- tested structured questionnaire was used for data collection. In this study, Major areas of strength are patient centered approach 68%, holistic care 56%. Overall patient satisfaction was found to be 52%. Moreover, all the participants in focus group acknowledged that MRCGP has indeed brought a positive change in their knowledge and consultation skills. The authors concluded that increased patient awareness has challenged health professionals, to not only increase their knowledge base, but also to incorporate this within their everyday practice. Hence, Impact of MRCGP [INT] professional examinations such as MRCGP [INT] can be a reliable way for the FPs/GPs to keep their knowledge level updated.

Hanoof Ali alqahtani, H.A., et al., did a descriptive cross-sectional survey was conducted targeting all females in Aseer region, southern of Saudi Arabia aging 18 years up to 65 years. The aim is to assess the level of public awareness, knowledge, and attitudes towards Pap smear as a screening test for cervical cancer among Saudi women, attending major healthcare facilities in the Aseer region. The survey included 956 females whose ages ranged from 18 to 65 years old. About 64% of the females were married and 29.9% were single. The authors concluded that the study revealed that there is a great lack of knowledge regarding Pap smear as a screening method of cancer cervix among Saudi females in Aseer region. The lack of knowledge was more reported among highly educated working female. The test should be done routinely in obstetrics and gynecology departments of the hospitals for high-risk groups.

Tufail, & Saghir, reported a 34-year-old lady presented to the practice with a one-day history of vertigo, and nausea. This caused her to fall and she had hit the left side of her head. She also described a headache on the side where she had landed and had not taken any analgesia. On arrival her observations were stable, and Migraine headache was considered the most likely cause of her symptoms. During her stay at the Emergency Department, the headache worsened so a CT scan was carried out. This revealed a sinus venous thrombosis. An Magnetic resonance Venogram was recommended and showed thrombosis of the left tranverse and sigmoid sinus. Cerebral Venous Thrombosis (CVT) is an uncommon disorder. However it has higher tendencies to occur in female patients younger than 40 years of age, smokers and or those with thrombophilia. Women who are pregnant and those who are taking hormonal contraceptive therapy are at risk (Fayaz, 2012) and in this case her BMI also needs to be taken into account as a confounding factor. The case appreciates the multifactorial nature of primary care and the need to keep all hats on during a consultation. This is what sets Family Medicine aside from other disciplines; The ability to appreciate a patient as a whole story rather than chapters.

Alruwaili, S. et al., did a cross-sectional study including 112 keratoconus patients who were treated with contact lenses, subjects were from different areas of Saudi Arabia. The aim is to determine the prevalence of contact lens use as well as the attitudes toward contact lens usage and its complications among keratoconus patients. Of 112 respondents, 84.8% were treated with hard lenses, while 23.2% used soft lenses. Complications reported among 57.1%, the most common being dry eyes. The authors concluded that the results of this study highlight negative habits of contact lens use and complications experienced by users. Although the study shows good practice among keratoconus patients, health education on contact lens hygiene is recommended to improve patient behaviour and prevent severe complications. In addition, further research must be undertaken to evaluate the awareness of contact lens related complications among KC patients.

Alfayea, M.A., et al., did a cross-sectional study was conducted among a sample of general adult population aged >18 years,. To assess extent of mobile using, and its possible impact on patterns of sleep quality disturbance among general population. The study included 475 participants. Their age ranged between 18 and 60 years with a mean±SD of 28.1±8.4 years. The overall smartphone addiction scale score ranged between 37 and 161 (out of 165) with a mean±SD of 100.2±21.4. Highest scores were reported among those using smartphone in playing games (p=0.003). There was a significant negative correlation between participants' age and their smartphone addiction scale scores (r= -0.112, p=0.015). Overall, poor sleep quality, based on PSQI was observed among 93.7% of participants. The authors concluded that smartphone addiction is an evident problem among our population, particularly younger. Smartphone addiction is associated with long sleep latency, shorter sleep duration, lower sleep efficiency, higher daytime sleep dysfunction and overall poor sleep quality.

Risk Factors, Clinical Features and Treatment Outcomes of Male Breast Cancer in Saudi Arabia: A Single Center Study

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Abstract

The aim of this study was to determine the risk factors, clinical features and treatment outcomes of Male Breast Cancer (MBC) patients in Saudi Arabia. This retrospective-cohort study was conducted in Princess Nora Oncology Center at King Abdulaziz Medical City in Jeddah, Saudi Arabia. By using consecutive sampling, all male patients who were diagnosed with breast cancer based on the pathology results that were collected from the medical records from January 1998 to December 2017 and treated in Princess Nora Oncology Center at King Abdulaziz Medical City, Jeddah, Saudi Arabia were included in this study. Excel was used to encode all the patients' data, while SPSS was used for the analysis. A descriptive statistic was used to find the minimum, maximum, and mean of age at the time of diagnosis. On the other hand, frequencies and percentages were utilized to summarize all other clinical features of the patients including the pathological type, stage at time of diagnosis, metastasis, risk factors, performance status, treatments and relapse. The mean age of all the 15 patients was 58 +/- 16.5 SD at the time of diagnosis, whereas the maximum was 91 and the minimum was 36. The most predominant type of male breast cancer was Invasive Ductal Carcinoma IDC, which affected 14 patients out of 15 (93.3%).

Key words: Male breast cancer; Ductal carcinoma; Clinical features; Risk Factors; Treatment.

Introduction

Breast cancer in men is a very rare disease, accounting for less than 1% of all cases of breast cancer and less than 1% of all cancers in men(1). Presentation includes palpable breast mass, which may be associated with nipple retraction or overlying skin changes and few cases have the initial presentation as abscess(2,3). Although breast cancer occurs predominantly in females and shares many similarities with male breast cancer, there are also some important differences(4). The etiology and pathogenesis of this disease have been linked in multiple factors. Of all the causes involved, BRCA2 mutations is found to be a related factor that clearly increases the chance of men to be affected with breast cancer(5). Apart from this factor, Klinefelter's syndrome, (6) life style and environmental factors including radiation and heat exposure, smoking, alcohol consumption, obesity , and the lack of physical activity, (5,6) and hepatitis (7,8) were also reported.

There are few cases of breast cancer among men that have been reported in the literature, however, the mortality rate is increasing worldwide. This could be due to the fact that men do not typically undergo routine clinical or self-evaluations for breast changes unlike females who are constantly advised to perform an early check-up to recognize the early signs of breast cancer and therefore perform prompt intervention when necessary(2). Particularly the disease is usually discovered in its late stages, which lowers the patients' survival rate. Although breast cancer treatment has improved significantly over time, the exact utility in adaption of this guideline in the management of breast cancer among men is still unknown.

The National Comprehensive Cancer Network (NCCN) guideline is one of the most established guidelines in the management of Female Breast Cancer FBM and is also used to treat male breast cancer.(9). The diagnosis of male breast cancer depends on several procedures and modalities besides the physical examination. Therefore, a combination of various diagnostic tests is essential for the diagnosis, grading, and staging of male breast cancer. The initial diagnostic tool is mammography, which is used to measure the symptoms of male breast cancer(5). However, to have an accurate result of the grading and the specific type of male breast cancer, a biopsy is the gold standard(10). On the other hand, PET/CT F-18 FDG is an excellent imaging procedure that determines the stage and the effectiveness of a therapy of breast cancer in males since it has a 100% sensitivity and an 89% accuracy for the detection of metastasis(11). Additionally, it is highly recommended to have BRCA genetic testing, especially for those individuals who have relatives with the history of breast cancer(5).

Treatment for male breast cancer varies from single or combination modalities based on many criteria including the type and the stage of the cancer. A mastectomy was considered the standard treatment years ago, but lumpectomy has raised in significance since it has shown 82.9% ten-year breast cancer survival compared to mastectomy that had only 77.3%(12). In order to avert the regrowth of cancer, Post-Mastectomy Radiation Therapy PMRT is highly considered to improve the overall survival rate(13). A hormonal therapy such as tamoxifen is very effective in patients with positive estrogen receptors(5). Moreover, chemotherapy is a systematic therapy that is suitable especially for patients with advanced stages and metastasis(5). Besides chemotherapy, there is also systematic targeted therapy including anti-HER and CK4,6 inhibitors in adjuvant and metastatic settings.

In this study, we investigated the risk factors, clinical characteristics and treatment outcomes of breast cancer among male Saudi patients, which may provide evidence that will help to improve the patient's prognosis and selection of proper treatment. Moreover, we tested for the association between several clinical and treatment factors to treatment outcomes for breast cancer among men. Finally, we identified the overall survival rate of male breast cancer patients in Saudi Arabia.

Methods

Study Design and area and settings

This retrospective-cohort study was conducted in Princess Nora Oncology Center at King Abdulaziz Medical City in Jeddah, Saudi Arabia. All male patients who were diagnosed with breast cancer based on the pathology results that were collected from the medical records of January 1998 to December 2017 and treated in Princess Nora Oncology Center at King Abdulaziz Medical City, Jeddah, Saudi Arabia were included in the study.

Identification of study participants

The sample size was calculated by using the Raosoft software from the website www.raosoft.com/samplesize.html. The total number of male breast cancer patients from January 1998 to December 2017 was 15. The required sample size was estimated at the 95 percent confidence level with an estimated 0.7% (14) prevalence of male breast cancer patients and margin of error of +/- 5%. The required minimum sample size was determined to be 10. As the sample size was small, we included all the 15 patients in our study during the above mentioned period. The selection of the sample was through consecutive sampling which involved recruiting all male patients diagnosed with breast cancer. Consecutive samples were collected retrospectively based on the medical records from January 1998 to December 2017.

Data collection process

Patients' data with the diagnoses of male breast cancer were collected form the database of the pathology lab in Princess Nora oncology center. All data dated before 2012 were verified with the data provided by the medical records, while data dated 2012 and later were verified with the institutional patient's database (Best Care) to ensure the accuracy of the data. Information was then collected into a hard copy data collection sheet. Required information included patient's date of birth, date of diagnosis, type of breast cancer, treatment provided, clinical features

including stage, pathology results, serology results, and laboratory workup and current status of the patient. Data were then transferred into an Excel sheet and all hard copies were safely discarded. All the three investigators were involved in collecting the data in both hard copy and soft copy. Anonymity and confidentiality of any information or data pertaining to the patients was assured by shredding all hard copy data and deletion of all soft copies that were used.

Data analysis

Excel was used to encode all the patients' data. The encoded data was then transferred into SPSS for analysis. A descriptive statistic was used to find the minimum, maximum, and mean of age at the time of diagnosis. On the other hand, frequencies and percentages were utilized to summarize all other clinical features of the patients including the pathological type, stage at time of diagnosis, metastasis, risk factors, performance status, treatments, and relapse.

Results

Here are the results of the clinical features of the patients. The mean age of 15 patients was 58 +/- 16.5 SD at the time of diagnosis, whereas the maximum was 91 and the minimum was 36. The most predominant type of male breast cancer was invasive ductal carcinoma, which affected 14 patients out of 15 (93.3%). However, one patient had an intraductal papilloma (6.7%). 40% of the patients presented with metastasis (6/15), while 33.3% had a locally advanced stage of the disease (5/15) and 26.6% had an early stage of the disease (4/15). Out of the six patients who presented with a metastatic disease, three of these patients had multiple metastasis in different organs including bone, lungs, liver, axillary lymph nodes. One patient had metastasised into the liver and left axillary lymph node, while another patient had metastasised in both bone and lungs. The last one out of the three 'multi-mets' had the spread into the liver, bone, and lungs. However, for the single organ involvement, two patients had metastasised into the axillary lymph nodes only and one patient had bone metastasis only. Accordingly, here the results of metastasis are stated based on the organ of involvement. Two patients had liver metastasis (13.3%), two patients had lung metastasis (13.3%), three patients had bone metastasis (20%), and three patients had axillary lymph nodes metastasis (20%). The ECOG performance status was 0 zero in two patients, 1 in two patients, 2 in two patients, 3 in one patient, and the remaining 8 patients had unknown scores.

Several risk factors were observed. The genetic testing of positive receptors was 46.7% (7/15). A single patient had only an ER+, while 5 patients had both ER and PR positive. The last patient had a triple positive of ER, PR, and HER-2. Another risk factor is a testicular disease, specifically benign prostatic hyperplasia, which accounted for 13.3% (2/15). Other risk factors that were detected in the patients are smoking in 3 patients, and obesity in 2 patients. Additionally, 2 patients had a positive family history of female breast cancer. One patient had a sister diagnosed with breast cancer, while the other one had an aunt.

In this part of the paper, the treatment results will be discussed. The majority of the patients had undergone surgical removal of cancer, while only 2 out of 15 (13.3%) had no surgery. 80% of the patients had a modified radical mastectomy MRM (12/15). On the other hand, only a single patient had a breast conservative surgery BCS (6.7%). Another therapeutic modality that the patients received was chemotherapy. 26.7% of the patients were treated with adjuvant chemotherapy (4/15). On the other hand, 6.7% had received both adjuvant and neoadjuvant (1/5). Lastly, 1 patient had palliative chemotherapy (6.7%). The third method of treatment is radiation therapy. 26.7 % of the patients had curative radiation therapy (4/15), while 20% had palliative radiotherapy (3/15). The last therapeutic modality was hormonal therapy. 53.3% of the patients had been given tamoxifen (8/5). In contrast, 6.7% had received letrozole (1/15). Finally, only 1 patient had a combination of tamoxifen, letrozole, and megace accounting for 6.7%.

The last part of the results is the relapse of the cancer. Only 2 patients (13.3%) had a recurrent distant metastatic disease. Both of these patients were treated with radiation and hormonal therapies (13.3%), while only one of them had received chemotherapy at the time of relapse (6.7%). Unfortunately, 80% of the patients were lost to follow up. One case had died (6.7%) and 2 were known to be alive (13.3%).

Table 1: Age at diagnosis

Variables	N	Minimum	Maximum	Mean ± SD
Age at diagnosis	15	36	91	58.33 ± 16.513

Table 2: Clinical features of study participants

Clinical Features	Percentage % (n/N)
Cancer pathology	
Invasive ductal carcinoma	93.3 (14/15)
Others	6.7(1/15)
Stage of cancer	
Early	26.6 (4/15)
Locally Advanced	33.3 (5/15)
Metastatic	40 (6/15)
Metastasis	
Liver	13.3 (2/15)
Lung	13.3 (2/15)
Bone	20 (3/15)
Other metastasis	20 (3/15)
Multi-organ metastasis	
Liver + axillary lymph node	6.6(1/15)
Bone + lungs	6.6(1/15)
Bone + lung + liver	6.6(1/15)
ECOG	
ECOG 0	13.3 (2/15)
ECOG 1	13.3 (2/15)
ECOG 2	13.3 (2/15)
ECOG 3	6.7 (1/15)
N/A	53.3 (8/15)
Family history	
Positive (Yes)	13.3 (2/15)
Negative (No)	86.7 (13/15)

Table 3: Risk factors of study participants

Risk Factors	Percentage (n/N)
Genetic testing risk	
Positive (Yes)	46.7 (7/15)
Negative (No)	53.3 (8/15)
Out of +ve genetic test 7	
ER	14.3 (1/7)
ER + PR	71.4 (5/7)
ER + PR + HER-2	14.3 (1/7)
Testicular disease	
Positive (Yes)	13.3 (2/15)
Negative (No)	86.7 (13/15)
Other risks (smoking, obesity, family hx.)	
Positive (Yes)	26.7 (4/15)
Negative (No)	73.3 (11/15)

Table 4: Treatments of study participants

Treatments	Percentage (n/N)
Surgery	
None	13.3 (2/15)
MRM	80 (12/15)
BCS	6.7 (1/15)
Chemotherapy	
Neoadjuvant	60 (9/15)
Adjuvant	26.7 (4/15)
Palliative	6.7 (1/15)
Adjuvant & neoadjuvant	6.7 (1/15)
Radiation therapy	
None	53.3 (8/15)
Curative	26.7 (4/15)
Palliative	20 (3/15)
Hormonal therapy	
None	33.3 (5/15)
Tamoxifen	53 (5/15)
Letrozole	6.7 (1/15)
Tamoxifen & Lentozole & Megace	6.7 (1/15)

Table 5: Relapse of study participants

Relapse	Percentage (n/N)
Distant metastasis	
Positive (Yes)	86.7 (13/15)
Negative (No)	13.3 (2/15)
Treatment at relapse	
Chemotherapy	6.7 (1/15)
Hormonal therapy	13.3 (2/15)
Radiation therapy	13.3 (2/15)
Status of patient at last follow up	
Alive	13.3 (2/15)
Died	6.7 (1/15)
Loss of follow Up	80 (12/15)

Discussion

Based on the results of the study, the most prominent type of male breast cancer was ductal carcinoma, which accounted for a total of 93.3%. That finding was very similar to data from more than 2,000 male cancer patients in the Surveillance, Epidemiology, and End Results (SEER) cancer registry in which ductal carcinoma accounted for 93.7% out of all the other remaining types of breast cancer in the male (6). Other research that had been done at the Sheri-i-Kashmir Institute of Medical Sciences also had 93.7% of invasive ductal carcinoma as the most common type of male breast cancer (15). The mean age at diagnosis was 58 with the range from 36 to 91 years, and these values were very comparable to a clinicopathological study in Nigerians that had a mean of 64 years and a range of 35 to 90 years (16). According to this paper 73.3% of the patients, unfortunately, presented to the clinic with an advanced stage of the disease. 40% of these patients had a metastatic disease, which was consistent with another study with stage IV disease accounting for 43% (16). Half of the patients with stage IV had multi-organ metastasis and there are two causes, which can explain that. First, there is a stereotype that breast cancer is a disease of females only. Therefore, lack of education and knowledge among males specifically will lead to a delay in the diagnosis and management of male breast cancer. A study on 28 adult men had shown that 80% of its participants lack the knowledge of the high risk of developing male breast cancer regardless of positive family history of a maternal blood relative with breast cancer (17). On the other hand, the second major reason behind the late presentation of the disease is the absence of an early screening program with mammography, unlike females. Therefore, lack of education and absence of early screening both contributed to the development of the advanced metastatic disease.

Many risk factors are associated with male breast cancer including family history, genetic disposition, testicular diseases, and other risks such as obesity and smoking. In a study, they found 9.3% of patients had undescended testes and infertility, whereas 6.2% had orchitis. In our study, 13.3% of the patients had benign prostatic hyperplasia. Besides, obesity is a risk factor accounting for 12.5% due to the increase in converting androgens to estrogen by peripheral aromatization (15). Obesity also doubles the risk of male breast cancer (18). In this study, two patients were obese. One study had shown a positive Estrogen Receptor (ER) and Progesterone Receptor (PR) on 39 participants, which accounted for 64% of the total patients (19). Similarly, in this study around half of the patients had positive outcomes in the genetic testing. Five patients were positive for both PR and ER, one patient was positive for only ER, and one patient was a triple positive of PR, ER, HER-2. Family history is also another important risk factor that has been mentioned in the literature. There is a 2.5 times increase in developing male breast cancer with a female relative who had breast cancer (6). As in our study, two patients were found to have a female family member with a history of breast cancer.

Treatment options for MBC followed the NCCN guidelines for FBC (9). In male patients, however, surgical treatment has been noted to be less conservative (20). Nevertheless, instead of a radical mastectomy, the surgical approach has been replaced with modified radical mastectomy which is less invasive (21). In our study, out of all male patients who underwent surgical intervention, 92% had an MRM. On the other hand, only 8% of our male patients used the BCS procedure. Chemotherapy was another modality used for MBC treatment. Although only 40% of our male patients received chemotherapy, most had received the treatment following a surgical intervention, while only 1 patient received the chemotherapy treatment without surgical involvement. 33% of the patients who underwent MRM received chemotherapy whether it was only adjuvant or both adjuvant and neoadjuvant. With histological findings,

radiotherapy is preferred. These findings can be nodal involvement, multifocality, or high proliferation (22). However, Radiotherapy is tended to be favored in high-risk patients (21). In Meguerditchian et al., 50 articles corresponding with the key word "male breast cancer" were reviewed, which found that "Most papers have indicated no net overall survival benefit of radiotherapy." (23). On the other hand, in a study done by Schuchardt et al., 8 out of 9 patients who received radiotherapy were alive and cancer-free, and they determined that "radiation therapy should play an important role in the management of male breast cancer."(24). In our study, where only 47% of our male patients received radiotherapy, detecting the survival rate was not plausible due to losing follow up with 86% of those patients. 67% of our male patients received hormonal therapy, and 60% of them were estrogen-receptor positive. Tamoxifen, which is an anti-estrogen, has shown to improve the survival rate in female patients. In males, however, there are no clinical trials that assessed the use of tamoxifen (5). Even though tamoxifen has not yet been assessed in male patients, the administration of this treatment in male patients has shown improved survival rate with an overall disease-free outcome, which places tamoxifen as an important treatment in most cases of male breast cancer (25).

Lastly, there were several limitations to this study. Male breast cancer is an uncommon disease. Therefore, it was very challenging to collect the proper sample size. The minimum required sample was 10 individuals, however, we collected the data of 15 patients. That challenge was not preventable because the rarity of this disease is out of our control. Another limitation was the collection of ECOG performance status scores of the patients. We observed that 8 patients out of the 15 had on ECOG score recorded. And one reason that could explain the lack of ECOG score documentation is the objectivity of this assessment method. The ECOG score will mainly depend on the objective evaluation of a physician and it may vary between one another. Therefore, not all treating physicians give focused attention to report the score. The last limitation was the inability to find the survival rate in this study due to loss of follow up. The dates of the last appointment at the hospital to find whether the patient was still alive or dead were missing for 12 patients out of the 15.

Conclusion

The main recommendation for any future studies is the involvement of multi-centers to improve the sample size since male breast cancer is a rare disease. Another recommendation is spreading awareness among males, especially those with known risk factors, regarding breast cancer and clarifying the misconception of it being a female-disease only. Hopefully, this can contribute to early presentation to the clinics. Accordingly, an early stage of the disease will be managed better than an advanced metastatic one.

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Prevalence and associated factors of burnout among female medical students in Taif University

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Abstract

Background: Burnout is one of the most prevalent dimensions of distress, medical students are facing during their study.

Objectives: to investigate the prevalence of burnout and its associated risk factors among female medical students in Taif University.

Methods: A cross-sectional study was done on female medical students using an online questionnaire. Data about socio-demographic characteristics were collected and the Maslach Burnout Inventory-Student Survey (MBI-SS) was used.

Results: The prevalence of burnout was about 23% of 213 participants. With 27% reporting high levels of EE, 62.4% had a high level of DP and a low level of PA was found among 8.9%. Most students who have burnout (65.3%) were studying more than 5 hours a day (0.025). Lower frequency of practicing exercise was a significant predictor of burnout (OR= 2.4, 95% CI= 1.1- 4.9, p= 0.017) as estimated by logistic regression analysis. A high percentage of DP was reported among the first year and the six year students (17.3 % and 18.8% respectively) (p=0.006).

Conclusion: Year of study, study hours, leisure time activities and exercise are factors influencing burnout among female medical students in Taif, KSA. Effective coping strategies should be considered to minimize burnout levels. Simple methods such as increased physical activity, leisure time activities and group discussion may reduce the likelihood of the development of burnout.

Key words: prevalence, factors, burnout, female, medical, Taif.

Introduction

Burnout is a syndrome that is formed of emotional exhaustion, depersonalization and low professional efficacy which occurs in some individuals who perform various kinds of work (1). The concept of the term Burnout Syndrome has been expanded to medical trainees and three factors have been noted: emotional exhaustion due to study requirements, feelings of cynicism and withdrawal from one's studies and low student academic efficacy (thought of incompetence or underachievement) (2).

Medical students go through stressful events, and they are engaged in multiple activities. They experience academic, existential and psychological stressors (3). Consequently, students who experience a high level of stress with poor coping strategies during medical school are vulnerable to develop burnout (4).

Researchers have described stressful moments/factors in the academic life of medical students, as they shift from a mostly didactic-filled schedule to one that is focused on patient care (5).

Factors that contribute to significant stress among students in medical schools include adaptation difficulties at the beginning of coursework. The excessive workload and educational content, combined with the high level of educational demands, and a lack of time for leisure, family and friends, also contribute to stress among medical students (6). Stress also occurs during the transition from the introductory clinical cycle to the clerkship cycle, where students feel limitations regarding the scientific knowledge, their changes from one stage to another, and the direct contact with seriously ill people who have a hopeless prognosis (7).

Prolonged stress is known to trigger disturbance in sleep-wake cycles, promote unhealthy lifestyles and increase propensity towards risky behavior (8). In literature regarding preclinical students, stress has also been shown to adversely impact on the efficiency of cognitive functioning that is important for learning (9).

Burnout among medical students can have serious consequences including poorer mental health, depression, suicidal ideation and thoughts of dropping out of medical school and decreased quality of life. Even beyond the impact on the student, it can affect the patients in their care. Burnout can decrease empathy for patients and affect patient care (10). It is important for medical schools, to ensure they have the right levels of support and also interventions for students who may display increased levels of stress and emotional distress during their course (11).

Medical schools now offer programs to improve or maintain student well-being. Strategies to better identify students at risk of distress and burnout are needed for successful outcomes (12). There are two critical pieces of information about burnout that need to be more fully developed. The first is to identify red flags for burnout to allow school administrators to intervene before serious consequences occur. The second piece is to identify what successful students are doing to prevent burnout during their medical school careers (10).

In the Kingdom of Saudi Arabia (KSA), a study was done in 2019 in Al Madina city to determine the prevalence of burnout and its associated factors among family residents. The study found that the significant predictors of burnout in the final model were examinations, large amount of content to be learnt, unfair assessment from superiors, work demands affecting personal/home life and lack of support from superiors (13).

A recent study was done in Jazan city in 2020 to assess the prevalence of burnout syndrome and its associated factors among medical students at Jazan University. The overall prevalence of burnout was estimated at 60.2% (14).

According to a careful literature review, studies done to assess burnout prevalence among female medical students in KSA are limited. Thus, the aim of this study was to investigate the prevalence and associated factors of stress and burnout among medical students in Taif University.

Subjects and Methods

The study was a cross-sectional study done on students of the College of Medicine, Taif University including all the female medical students from first to the sixth year, and the interns from April to May 2019.

In this study an online questionnaire was used that consisted of two sections: the first section identified socio-demographics and personal characteristics of the participants such as academic year, study hours, frequency of exercise weekly, frequency of going out weekly during leisure time, and frequency of spending time doing something fun or practicing a hobby daily. and the second section is based on Maslach Burnout Inventory-Student Survey (MBI-SS) and modification was done to be applied in our locality.

In 1981, Maslach and Jackson created the Maslach Burnout Inventory (MBI), which is currently the most commonly used scale in the world for assessing the syndrome (1). The MBI has three versions: one of them is the MBI-Human Service Survey (MBI-HSS), designed for professionals working in people-centered services, such as doctors, nurses, psychologists and students of health professions (15).

The MBI evaluates the prevalence of Burnout by exploring the three components: Emotional exhaustion (EE), depersonalization (DP) and personal achievement accomplishment (PA). High scores for EE and DP and low scores for PA lead to a high Burnout index. The PA dimension has an inverse score – the higher the score,

the better the individual's perception of their professional satisfaction and efficacy (16).

EE is the feeling of being completely drained, both emotionally and physically, due to extreme overwork. DP is a combination of a negative, skeptical behavior, and a feeling of indifference towards others. Low PA is the tendency to judge oneself badly or unfavorably especially towards one's own work (17). EE was measured using seven items, DP was measured using seven items and PA was measured using eight items. All survey items were scored on a scale from 0 to 6; (0 = Never, 1 = Few times per year, 2 = Once a month, 3 = Few times per month, 4 = Once a week, 5 = Few times per week, 6 = Everyday) (18).

Data analysis: statistical analysis was carried out using SPSS software version 22. Categorical variables were presented by simple frequency format. Standard deviation and mean scores were applied to quantitative and numerical variables. To quantify possible associations between variables and burnout subscales, Chi square test was used. Aiming to determine factors predicting burnout multiple regressions test were used with calculated odds ratios and 95% confidence interval and P value ≤ 0.05 was considered to be statistically significant for all tests.

Ethical approval: the study was approved by the Medical Research Ethics Committee of Taif University. Subjects were informed that their participation was anonymous and voluntary.

Results

A total of 213 undergraduate female medical students filled out the questionnaire and were stratified per academic year as follows; first year (n = 29), second year (n = 37), third year (n = 28), fourth year (n = 39), fifth year (n= 34), sixth year (n=35) and Internship (n=11). About half of the participants (49.3%) study more than 5 hours a day; 60% of the participants don't practice exercise and 59.6% of the participants go out once a week. About two thirds of the participants (75.1%) spend one hour a day doing something fun or practicing a hobby (Table 1).

About 30% of the students reported moderate level of emotional exhaustion (EE) and 27% reported high levels. However, about 62.4% of the students reported a higher level of depersonalization (DP). Moreover, about 8.9% of the students showed low levels of personal achievement (PA) and 23% showed moderate PA levels. The overall burnout prevalence was 23% (Table 2).

The mean subscale score of EE was 21.1± 11.04 indicating moderate levels. The DP mean subscale score was 14.9 ± 9.2 indicating a high level (Figure 1).

Most of the students who indicated a high level of EE (65.5%) were students studying more than 5 hours a day while 34.5% of students study 2-4 hours a day and 0% of students study 1 hour a day (p= 0.004). Also, half of students with a high level of EE were going out once a week and 41.4% of them don't go out during the week (p= 0.017).

The level of DP was high in all school years. High percentages were reported in the first year and the six-year students (17.3 % and 18.8% respectively) (p=0.006) (Table 4).

Analysis of association of demographic and personal characteristics with personal achievement revealed that the highest percentage of the students who reported high level 81 (55.9%), moderate 33 (67.3%) and low 13 (68.4%) level of PA were going out one day a week (p= 0.012) (Table 5).

Regarding the relation of demographic and personal characteristics with presence or absence of burnout, most of the students who have burnout 65.3% were studying more than 5 hours a day (0.025) (Table 6).

Binary logistic regression was conducted to determine the association between the burnout as dependent variables and student demographic and personal characters as independent variables. Table 7 shows that lower frequency of practicing exercise was a significant predictor of burnout (OR= 2.4, 95% CI= 1.1- 4.9, p= 0.017) as estimated by logistic regression analysis.

Table 1. Distribution of the participants according to their demographic and personal characteristics

Variable	categories	N (213)	%
Academic year	1st year	29	13.6
	2nd year	37	17.4
	3rd year	28	13.1
	4th year	39	18.3
	5th year	34	16.0
	6th year	35	16.4
	Internship	11	5.1
How many hours do you spend studying each day?	One hour	6	2.8
	2-4 hours	102	47.9
	≥5 hours	105	49.3
Do you practice exercises?	0	129	60.0
	1 (once a week)	38	17.8
	3 (3 times a week)	21	9.9
	5 (5 times a week)	10	4.7
	7 (7 times a week)	15	7.0
How many times do you go out a week during leisure time?	0	63	29.6
	1	127	59.6
	2	22	10.3
	3	1	0.5
How many hours do you spend doing something fun or practice a hobby each day?	1	160	75.1
	3	53	24.9

Table 2. Level of components of Maslach Burnout Inventory in studied group

Variable	categories		N (213)	%
Burnout	No burnout		164	77%
	Yes burnout		49	23%
Emotional exhaustion (EE)	low	≤17	91	42.7%
	moderate	18 - 29	64	30%
	high	≥30	58	27%
Depersonalization (DP)	low	≤5	37	17.3%
	moderate	6-11	43	20.1%
	high	≥12	133	62.4%
Personal achievement (PA)	high	≤33	145	68%
	moderate	34-39	49	23%
	low	≥40	19	8.9%

Figure 1: Mean ± SD of MBI subscales (emotional exhaustion (EE), depersonalization (DP) and Personal achievement (PA)).

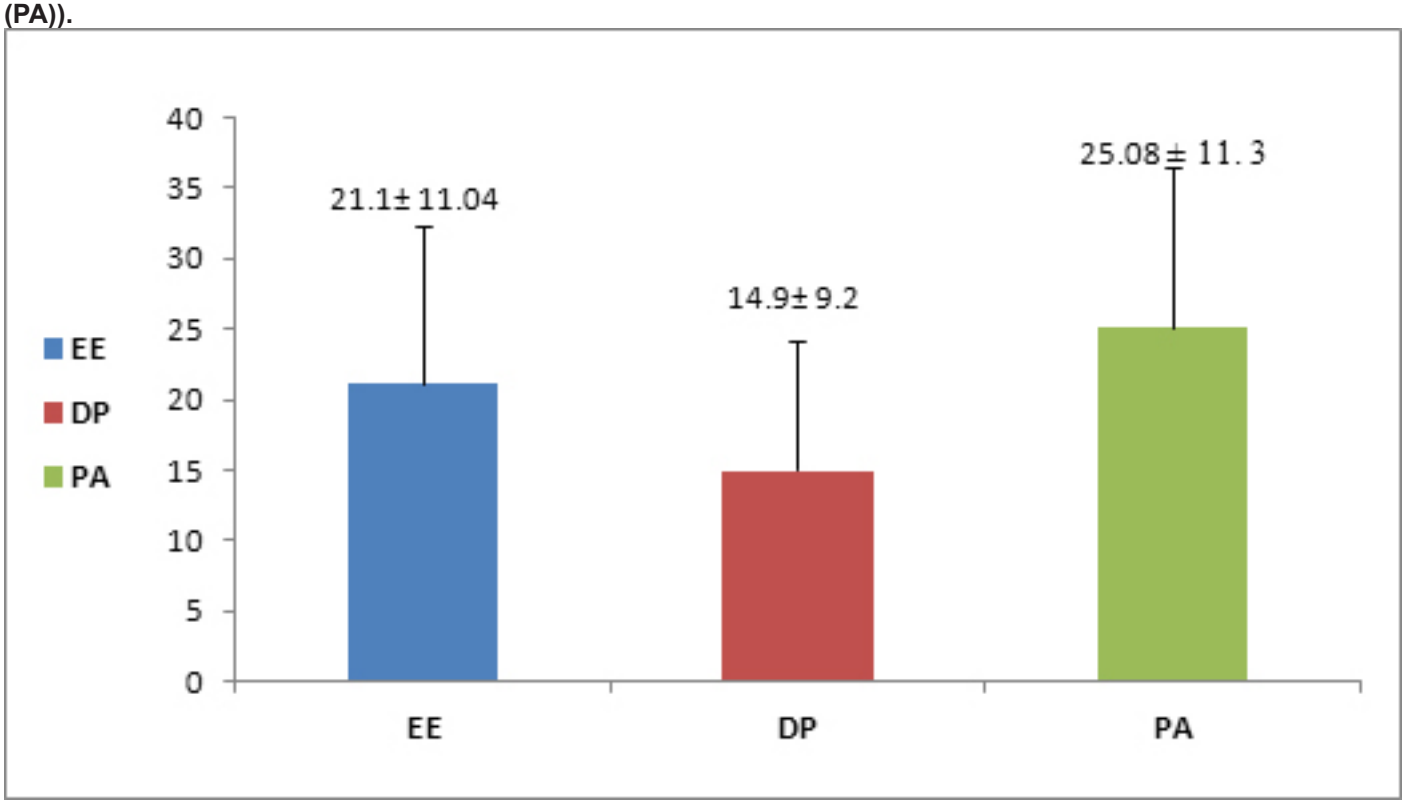

Table 3. Relation between demographic and personal characteristics and emotional exhaustion

Variable		Emotional exhaustion (EE)			X2	P-value
		≤17 (low)	18 – 29 (Moderate)	≥30 (High)		
Academic year	1st year	13 (14.3%)	7 (10.9%)	9 (15.5%)	18.369	0.105
	2nd year	14 (15.4%)	9 (14.1%)	14 (24.1%)		
	3rd year	8 (8.8%)	14 (21.9%)	6 (10.3%)		
	4th year	23 (25.3%)	9 (14.1%)	7 (12.1%)		
	5th year	15 (16.5%)	8 (12.5%)	11 (19.0%)		
	6th year	14 (15.4%)	15 (23.4%)	6 (10.3%)		
	Internship	4 (4.4%)	2 (3.1%)	5 (8.6%)		
Study hours	One hour	4 (4.3%)	2 (3.1%)	0 (0%)	15.225	0.004
	2-4 hours	55 (60.4%)	27 (42.2%)	20 (34.5%)		
	≥5 hours	32 (35.1%)	35 (54.7%)	38 (65.5%)		
Practice exercises	0	48 (52.7%)	40 (62.5%)	41 (70.7%)	8.017	0.432
	1	20 (22.0%)	10 (15.6%)	8 (13.8%)		
	3	10 (11.0%)	6 (9.4%)	5 (8.6%)		
	5	4 (4.4%)	5 (7.8%)	1 (1.7%)		
	7	9 (9.9%)	3 (4.7%)	3 (5.2%)		
Go Out a week for free time	0	15 (16.5%)	24 (37.5%)	24 (41.4%)	15.407	0.017
	1	62 (68.1%)	36 (56.2%)	29 (50.0%)		
	2	13 (14.3%)	4 (6.2%)	5 (8.6%)		
	3	1 (1.1%)	0 (0.0%)	0 (0.0%)		
Doing something fun /hobby	1	64 (70.3%)	51 (79.7%)	45 (77.6%)	2.020	0.364
	3	27 (29.7%)	13 (20.3%)	13 (22.4%)		

Table 4: Relation between demographic and personal characteristics and depersonalization

Variable		Depersonalization (DP)			X2	P-value
		≤ 5 (low)	6 - 11 (Moderate)	≥12 (High)		
Academic year	1st year	1 (2.7%)	5 (11.6%)	23 (17.3%)	27.690	0.006
	2nd year	6 (16.2%)	11 (25.6%)	20 (15.0%)		
	3rd year	1 (2.7%)	7 (16.3%)	20 (15.0%)		
	4th year	14 (37.8%)	9 (20.9%)	16 (12.0%)		
	5th year	9 (24.3%)	5 (11.6%)	20 (15.0%)		
	6th year	4 (10.8%)	6 (14.0%)	25 (18.8%)		
	Internship	2 (5.4%)	0 (0.0%)	9 (6.8%)		
Study hours	One hour	1 (2.7%)	1 (2.3%)	4 (3.0%)	2.630	0.622
	2-4 hours	20 (54.1%)	24 (55.8%)	58 (43.6%)		
	≥5 hours	16 (43.2%)	18 (41.9%)	71 (53.4%)		
Practice exercises	0	18 (48.6%)	25 (58.1%)	86 (64.7%)	10.788	0.214
	1	12 (32.4%)	6 (14.0%)	20 (15.0%)		
	3	3 (8.1%)	7 (16.3%)	11 (8.3%)		
	5	1 (2.7%)	1 (2.3%)	8 (6.0%)		
	7	3 (8.1%)	4 (9.3%)	8 (6.0%)		
Go Out a week	0	7 (18.9%)	12 (27.9%)	44 (33.1%)	12.078	0.060
	1	21 (56.8%)	29 (67.4%)	77 (57.9%)		
	2	9 (24.3%)	2 (4.7%)	11 (8.3%)		
	3	0 (0.0%)	0 (0.0%)	1 (0.8%)		
Doing something fun	1	23 (62.2%)	35 (81.4%)	102 (76.7%)	4.406	0.110
	3	14 (37.8%)	8 (18.6%)	31 (23.3%)		

Table 5. Relation between demographic and personal characteristics and personal achievement

Variable		Personal achievement (PA)			X2	P-value
		≤ 33 (High)	34-39 (Moderate)	≥40 (low)		
Academic year	1st year	16 (11.0%)	12 (24.5%)	1 (5.3%)	18.592	0.099
	2nd year	26 (17.9%)	9 (18.4%)	2 (10.5%)		
	3rd year	26 (17.9%)	1 (2.0%)	1 (5.3%)		
	4th year	26 (17.9%)	8 (16.3%)	5 (26.3%)		
	5th year	22 (15.2%)	9 (18.4%)	3 (15.8%)		
	6th year	22 (15.2%)	7 (14.3%)	6 (31.6%)		
	Internship	7 (4.8%)	3 (6.1%)	1 (5.3%)		
Study hours	One hour	3 (2.1%)	2 (4.1%)	1 (5.3%)	4.048	0.400
	2-4 hours	69 (47.6%)	27 (55.1%)	6 (31.6%)		
	≥5 hours	73 (50.3%)	20 (40.8%)	12 (63.2%)		
Practice exercises	0	98 (67.6%)	25 (51.0%)	6 (31.6%)	13.090	.109
	1	22 (15.2%)	11 (22.4%)	5 (26.3%)		
	3	12 (8.3%)	6 (12.2%)	3 (15.8%)		
	5	6 (4.1%)	2 (4.1%)	2 (10.5%)		
	7	7 (4.8%)	5 (10.2%)	3 (15.8%)		
Go Out a week	0	53 (36.6%)	7 (14.3%)	3 (15.8%)	14.297[a]	.026
	1	81 (55.9%)	33 (67.3%)	13 (68.4%)		
	2	10 (6.9%)	9 (18.4%)	3 (15.8%)		
	3	1 (0.7%)	0 (0.0%)	0 (0.0%)		
Doing something fun	1	109 (75.2%)	37 (75.5%)	14 (73.7%)	.025	.987
	3	36 (24.8%)	12 (24.5%)	5 (26.3%)		

Table 6. Relation between demographic and personal characteristics and presence or absence of burnout

Variable		Burnout		X2	P-value
		No	Yes		
Academic year	1st year	22 (13.4%)	7 (14.3%)	9.404	0.152
	2nd year	24 (14.6%)	13 (26.5%)		
	3rd year	24 (14.6%)	4 (8.2%)		
	4th year	32 (19.5%)	7 (14.3%)		
	5th year	24 (14.6%)	10 (20.4%)		
	6th year	31 (18.9%)	4 (8.2%)		
	Internship	7 (4.3%)	4 (8.2%)		
Study hours	One hour	6 (3.7%)	0 (0.0%)	7.415	0.025
	2-4 hours	85 (51.8%)	17 (34.7%)		
	≥5 hours	73 (44.5%)	32 (65.3%)		
Practice exercises	0	92 (56.1%)	37 (75.5%)	6.360	0.174
	1	33 (20.1%)	5 (10.2%)		
	3	17 (10.4%)	4 (8.2%)		
	5	9 (5.5%)	1 (2.0%)		
	7	13 (7.9%)	2 (4.1%)		
Go Out a week	0	44 (26.8%)	19 (38.8%)	2.868	0.412
	1	101 (61.6%)	26 (53.1%)		
	2	18 (11.0%)	4 (8.2%)		
	3	1 (0.6%)	0 (0.0%)		
Doing something fun	1	123 (75.0%)	37 (75.5%)	.005	0.942
	3	41 (25.0%)	12 (24.5%)		

Table 7. Logistic regression analysis of burnout and student demographic and personal characteristics

	OR	P value	95% CI
Academic year	0.22	0.07	0.04-1.1
Study hours	0.4	0.07	0.2-0.8
Practice exercises	2.4	0.017*	1.1- 4.9
Go Out a week	1.07	0.11	0.89-3.3
Doing something fun	1.02	0.94	0.49-2.1

Discussion

In this study, which included only the female students from 1st to internship year, the prevalence of burnout was about 23%. This result is slightly higher than the prevalence reported by Altannir et al., 2019 (19) who reported the prevalence of burnout was 13.4% in their undergraduate students in Riyadh, Saudi Arabia. While another study in Saudi Arabia by Almalki et al., 2019 (20) reported a burnout prevalence of 67.1% which was applied on male and female students.

Worldwide, the prevalence of burnout ranged between 28 to 61% (4,21,22,23). This difference in the level among different medical schools could be attributed to different curriculum among schools and different risk factors.

In our study the percentage of participants reporting high levels of EE was (27%) and high level of DP was (62.4%), and low levels of PA was (8.9%). The high level of depersonalization in our study is a warning sign that should be taken with great attention. Two previous studies have shown that having at least one high burnout subscale can affect medical students negatively in a way that interferes with the learning process and also causes fatigue and emotional instability (24,25).

The three dimensions of the burnout syndrome could precipitate each other; the medical students with low adaptation to difficulties could develop EE and may become indifferent and impersonalized culminating in the sense of failure and dissatisfaction (7).

It also has been stated that high EE is linked to low physical well-being (26,27). The quality of life of undergraduate medical students also seems to be influenced by burnout, which in turn affects health care (28).

Our study demonstrated an association between EE and hours of study, with students who study more than 5 hours a day indicating a high level of EE (p= 0.004). In the study of Youssef, 2016 (23) burnout was associated with studying long hours while in Albalawi et al., 2017 (29), study hours non-significantly affected burnout level. Studying long hours each day often points to academic burden placed upon the students; moreover the climate of medical schools in developed nations often exacerbates this problem by comparison with their student counterparts which makes them often feel embarrassed and harassed.

We demonstrated in this study a significant association between EE and frequency of going out a week, with little rate of going out showing a high level of EE (p= 0.017). This reflects the known advantages of relaxation and better spending of leisure time upon mental health and reducing rates of burnout and thus could also be considered as a potential intervention strategy.

This study revealed that DP was positively associated with year of study, specifically the reported high levels were in the 1st and 6th year of study. The increased percentage of DP in the 1st year medical students could be attributed to lower adaptation by the students, which is gradually improved in the subsequent years of study. While the second rise in DP scores in the six year students might be attributed to increased contact with patients and increased responsibilities (a lack of clinical continuity, poor levels of feedback from senior doctors, and hostile attitudes during training).

In support of our results Sreeramareddy et al. reported that the first year medical students have higher levels of burnout in comparison to second-year medical students, and related this to a result of the improved individual experience with time throughout their hard study circumstances (30).

Previous research by Dyrbye et al. found that DP increased with year of study in American medical schools (3), which have a potential effect in communication with patients. Moreover, Jo Cecil et al., 2014 (31) found an association with being in fifth year in comparison to first year as significant predictors of higher DP scores.

When we examined the relation between demographic and student characteristics with PA scores, low PA was associated with lower time of going out. These finding were in accordance with Shah, et al. and Sreeramareddy, et al. who have reported that among the academic factors, lack of time off, was significantly associated with burnout among medical students (30,32).

Weight et al., 2013 postulated that physical activity may be associated with a reduction in the experience of burnout in trainee doctors (33). Moreover, physical activity is extremely beneficial for mental health (34).

Salmon, 2001 reported many beneficial aspects of physical activity, including an improved sense of self-control and higher social interaction, which may have positive implications for mental health (35). Thus, the results of this study suggested that practicing exercise regularly by medical students might help to protect students from the hazardous effects of burnout.

The Gallup report states that people who exercise 2 days a week are happier, have less stress and less fatigue; moreover, just 20 minutes of exercise can improve mood for several hours (36). Studies have demonstrated that the frequency of exercise decreases throughout medical school (37), thus, if the medical students could practice exercise regularly, they might be able to reduce mental distress and subsequently prevent burnout.

In line with our results, and in support of the quality of life, Saudi universities are moving towards achieving the Kingdom's 2030 goals in seeking to raise the level of exercise in society and have worked from this logic to invest their capabilities to create the appropriate environment and sports programs for female students. At a time when the sports federation of Saudi universities is looking for the university environment to be one of the best places to practice women's sport, work is underway on a project of training incubators in universities to provide students with training environments throughout the year.

Krasner, et al. found that self-awareness exercises among primary care physicians reduced both burnout and mood disturbance in them and improved their empathy (38).

Limitations

Using a self-administered questionnaire that may have a recall bias is the limitation of the present study. In addition, the cross-sectional research used may show the associations between variables but not the causal relationships.

Conclusion

This study illustrated that the year of study, study hours, leisure time activities and exercise are factors influencing burnout among female medical students in Taif, KSA. Effective coping strategies should be considered to minimize burnout levels. Simple methods such as increased physical activity, leisure time activities and group discussion may reduce the likelihood of the development of burnout.

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Knowledge, attitudes, and practices concerning self-medication with antibiotics among the public in Aseer region, Saudi Arabia

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Abstract

Background: Antibiotics are a cluster of drugs used to combat microorganisms and treat infections, hence they are the major tool to help the natural defence of the body in the management of infection. Internationally, antibiotic misuse has been reported to be due to multiple factors, including lack of compliance, and availability of antibiotics as over-the-counter medications with absence of rules and regulations that prohibit such practice.

Aim: To assess knowledge, attitudes, and practices concerning self-medication with antibiotics among the public in Aseer region, Saudi Arabia.

Methodology: A population based cross-sectional survey was conducted targeting the general population in Aseer region, southern Saudi Arabia. Persons on long use of antibiotics due to chronic health problems were excluded. Data were collected over a period of four months based on a pre-structured electronic questionnaire. The questionnaire was constructed by researchers with the help of experts and intensive literature review.

Results: A total of 843 participants completed the study questionnaire. Participants' ages ranged from 18 to 66 years old with mean age of 34.3 ± 11.3 years old. The majority of participants were females (70.5%; 594) and Saudis (99.3%; 837). Exactly 796 (94.4%) of the respondents reported that Antibiotics should be purchased according to a doctor's prescription, and 450 (89%) correctly said that Antibiotics have side effects, and sometimes are dangerous. Regarding participants' attitude, 812 (96.3%) of the participants agreed that it is necessary to have additional information regarding the use of antibiotics, 688 (81.6%) agreed that the effectiveness of treatment diminishes if the full course of antibiotic therapy is not completed. As for practice, exactly 94.4% of the participants reported that they carefully read the instructions included before using antibiotics.

Conclusions & recommendations: In conclusion, the study revealed that the population in Aseer region had poor knowledge regarding antibiotic use in total. Also, participants' practice was questionable and needed to be improved to adhere to safe practices with antibiotic use.

Key words: Antibiotics, Awareness, Attitude, Practice, General population, Knowledge, Antibiotics misuse, Prescription.

Background

Antibiotics are the drugs used to fight microorganisms and combat infections, hence they are the major tool to help the natural defense of the body in the management of infection [1]. An infection was considered serious until the discovery of antibiotics. The meaning of antibiotics is ‘‘against life’’, which is derived from the fact that an antibacterial drug is extracted from living creatures and used to kill or attenuate bacteria. However, there is an obvious association between longer duration and multiple courses of antibiotic intake and higher rates of bacterial resistance [2-4]. The misuse of antibiotics could be due to poor awareness regarding antibiotics prescription, the indication of patient’s intake, and weak spreading awareness among patients through physicians and negative attitudes and practice patterns [5-7]. The applicability of strict control methods related to their prescription are important factors that involve interactions between health caregivers, community pharmacists and populations [8, 9]. Nosocomial infections caused by multi-resistant, bacillus Gram-negative bacteria are associated with high morbidity and mortality, especially in intensive care units and wards, and the costs of hospital stays are increased with patients requiring 2nd or 3rd line drugs that are less effective and more toxic and expensive [10].

Internationally, antibiotic misuse was reported to be due to multiple factors, including lack of compliance, availability of antibiotics as over-the-counter medications with absence of rules and regulations that prohibit such practice [11, 12]. Lack of healthcare professional knowledge and/or appropriate patient education usually plays a key role in such findings [13]. Antibiotic misuse may have a massive effect on social, economic and health aspects due to the emergence of bacterial resistance which is the resistance of a microorganism to an antimicrobial drug that was originally effective for treatment of infections caused by it [13]. This phenomenon may lead to the ultimate result of failure of first-line antibacterial treatment forcing the patient to shift to less conventional medications, many of which are more expensive and/or associated with more serious side effects.

In 2011, WHO set the theme of World Health Day as ‘Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow’ [14]. In 2014, WHO reported increasing levels of antibiotic resistance that is threatening the control of bacterial diseases and resulting in social and economic burdens. It also reported a major knowledge gap about the magnitude of antibiotic resistance in the Middle East and worldwide [15].

Previous studies assessing knowledge and attitude regarding AB use and misuse among adult population of Kuwait and Jordan revealed unsatisfactory knowledge regarding AB use [16, 17]. Moreover, research in different parts of Saudi Arabia among adults showed patterns of inappropriate AB knowledge and practice [18-20]. Therefore, the purpose of the present study was to estimate the extent of antibiotic misuse and factors associated with antibiotic self-medication among the Saudi population in Aseer region, southern Saudi Arabia.

Methodology

A descriptive cross-sectional approach was used targeting all accessible population in Aseer region, Southern Saudi Arabia. All those with ages of 18 years or more living in Aseer region were invited to participate in the survey. A total of 1,000 individuals received the study survey. Exactly 843 respondents completed the study questionnaire with a response rate of %. After obtaining permission from the Institutional ethics committee, data collection started. Data were collected from participants using an online pre-structured questionnaire. The researchers constructed the survey tool after intensive literature review and expert’s consultation. The tool was reviewed using a panel of 3 experts for validation and applicability. Tool reliability was assessed using a pilot study of 30 participants with reliability coefficient (α-Cronbach’s) of 0.79 for awareness, and 0.74 for attitude. The tool covered the following data: participants’ socio-demographic data such as age, gender, work, and education. Awareness was assessed using 9 questions with one correct answer for each. Attitude was assessed by 10 items with a 5-point Likert scale ranging from 1 for strongly disagree to 5 for strongly agree. Practice regarding antibiotics use was assessed in the third part using 9 items. The questionnaire was uploaded online using social media platforms by the researchers and their friends during the period from 15th May till 30th of July 2020. All accessible and eligible population in the study setting were invited to fill in the attached tool.

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A patient with score less than 60% (6 points) of the maximum score was considered to have poor awareness while good awareness was considered if they had score of 60% (7 points or more) of the maximum. Composite mean for awareness items was assessed and participants with means score up to 3.5 out of 5 were considered to have negative or neutral attitude and others with a composite mean of 3.6 to 5 were considered to have a positive attitude. Negative statements scores were reversed where strongly disagree had 5 points and strongly agree had 1 point. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, awareness items and participants’ practice. Crosstabluation was used to assess distribution of awareness according to participants’ personal and medical data. Relations were tested using Pearson chi-square test.

Results

The study included 843 participants who completed the questionnaire. Participant's ages ranged from 18 to 66 years old with mean age of 34.3 ± 11.3 years old. The majority of participants were females (70.5%; 594) and Saudis (99.3%; 837). University level of education was reported among 655 (77.7%) participants and 249 (29.5%) were working. As for monthly income, it was below 3000 SR per month among 784 (93%) participants and 15 (1.8%) had monthly income exceeding 10000 SR (Table 1).

Table 2 demonstrates awareness regarding antibiotics use among the general population in Aseer region, south-western Saudi Arabia. Exactly 796 (94.4%) of the respondents reported that Antibiotics should be purchased according to a doctor's prescription, 450 (89%) correctly said that Antibiotics have side effects, and sometimes are dangerous, 612 (72.6%) agreed that overuse of antibiotics can lead to bacterial resistance, and 652 (66.7%) reported that repeated non-compliance with the course of antibiotic therapy increases bacterial resistance. Only 104 (12.3%) agreed that it is preferable to give the antibiotic intravenously for any case and 141 (16.7%) reported that antibiotics can prevent skin infections when put on wounds. Totally, 122 (14.5%) respondents had a good awareness level regarding antibiotics use and prescription.

Regarding participants attitude towards antibiotic use and prescription (Table 3), 812 (96.3%) of the participants agreed that it is necessary to have additional information regarding the use of antibiotics, 688 (81.6%) agreed that the effectiveness of treatment diminishes if the full course of antibiotic therapy is not completed, 688 (81.6%) refuted that the treatment can be stopped after one or two days after the improvement of your symptoms, 686 (81.4%) also refuted that one can self-prescribe antibiotics instead of consulting a doctor when suffering from a minor illness, and 593 (70.3%) agreed that reducing the inappropriate use of antibiotics plays an important role in preventing bacterial resistance to antibiotics while 179 (21.2%) agreed to have antibiotics with a common cold. Overall, 602 participants had a positive attitude towards safe antibiotic use and prescription (71.4%).

Table 4 illustrates practice regarding antibiotics use among the general population in Aseer region, south-western Saudi Arabia. Exactly 94.4% of the participants reported that they carefully read the instructions included before using antibiotics, 89.6% said that they experienced adverse reactions while self-medicating with antibiotics, 72.7% reported that they used antibiotics to prevent a common cold, and 63.3% changed their antibiotics during the self-medication period. Only 46.5% of the participants had multiple antibiotics at the same time during a specific infection and 51.6% changed the dose while self-medicating with antibiotics while 57.3% prefer intravenous antibiotics when they are sick.

Table 5 shows distribution of participant's awareness level and attitude towards antibiotic use by their personal data. Regarding awareness, 22.7% of old aged participants had a good awareness level regarding antibiotics use compared to 7.6% of those who were below 30 years with recorded statistical significance (P=.001). Also, good awareness was significantly higher among the less educated participants (26.8%) in comparison to highly educated (15%) (P=.011). Participants with undetected jobs had higher level of awareness than others (18.9% vs. 12.9% and 3.5%, respectively; P=.001).

As for attitude, 79.5% of old aged participants had a positive attitude towards safe antibiotics use and prescription compared to 63.6% of young age group (P=.001). Also, positive attitude was detected among 77.5% of those who are working in comparison to 66.7% of students (P=.032).

Discussion

The current study aimed to assess public awareness, attitude, and practice regarding antibiotics safe use and prescription in Aseer region, Saudi Arabia. The study revealed that more than half of the respondents were knowledgeable regarding importance of having antibiotics with physician prescription as unprescribed intake of antibiotics with inappropriate doses and duration mostly causes bacterial resistance, which is correct. This was lower than what was previously detected in a study conducted in Saudi Arabia [21] which revealed that 48 % of respondents reported using antibiotics without physician prescription. In addition, other studies from different areas including Iraq, Egypt, Jordan, Palestine, as well as other parts of the whole world showed irresponsible, overuse and self-medication with antibiotics [22-29]. Regarding bacterial resistance, the current study findings were consistent with what has been previously reported for antibiotic overuse as regards more antimicrobial resistance as well as appearance of resistant bacterial strains [30, 31]. Also, participants were knowledgeable regarding side effects and its dangerous consequences. The awareness items which were somewhat low, were route of intake of antibiotics where most participants preferred intravenous injections. In total, the study showed that overall awareness regarding antibiotics was poor (14%) irrespective of recording high awareness level for individual items. This can be explained by that not all participants were knowledgeable regarding all items but may have good knowledge for some items and poor for others and this makes the cumulative knowledge poor. The assessed poor awareness level in the current study was much lower than other similar research which assessed public awareness level of at least 50% with good awareness [32-35]. Higher awareness was reported among old aged participants which may be those who previously had infections or chronic disorders with bacterial infections and needed antibiotic intake making them familiar with their effect and use. The surprising finding was that good knowledge regarding antibiotic use was higher among low educated participants than university graduated groups

Table 1. Personal characteristics of the study participants, Saudi Arabia, 2020

Personal characteristics		No	%
Age in years	< 30 years	330	39.1%
	30-39	240	28.5%
	40+	273	32.4%
Gender	Male	249	29.5%
	Female	594	70.5%
Nationality	Saudi	837	99.3%
	Non-Saudi	6	.7%
Educational level	Below secondary	41	4.9%
	Secondary	147	17.4%
	University/ more	655	77.7%
Job	Student	144	17.1%
	Working	249	29.5%
	Others	450	53.4%
Monthly income	<3000 SR	784	93.0%
	3000-10000 SR	44	5.2%
	> 10000 SR	15	1.8%

Table 2. Awareness regarding antibiotics use among general population in Aseer region, south-western Saudi Arabia

Awareness items	Right		Wrong		Don't know	
	No	%	No	%	No	%
Antibiotics are the same as anti-inflammatory	394	46.7%	207	24.6%	242	28.7%
Antibiotics should be purchased according to a doctor's prescription	796	94.4%	22	2.6%	25	3.0%
Antibiotics can be effective for treating viral infections	381	45.2%	295	35.0%	167	19.8%
Antibiotics can prevent skin infections when put on wounds	141	16.7%	427	50.7%	275	32.6%
It is preferable to give the antibiotic intravenously for any case	104	12.3%	531	63.0%	208	24.7%
You can stop treatment as soon as the symptoms disappear	86	10.2%	693	82.2%	64	7.6%
Overuse of antibiotics can lead to bacterial resistance	612	72.6%	70	8.3%	161	19.1%
Repeated non-compliance with the course of antibiotic therapy increases bacterial resistance	562	66.7%	103	12.2%	178	21.1%
Antibiotics have side effects, and sometimes are dangerous	750	89.0%	21	2.5%	72	8.5%
Overall awareness	Poor		Good			
	721 (85.5%)		122 (14.5%)			

Table 4. Practice regarding antibiotics use among general population in Aseer region, south-western Saudi Arabia.

Practice items	Always		Often		Sometimes		Seldom		Never	
	No	%	No	%	No	%	No	%	No	%
How often have you experienced adverse reaction while self-medicating with antibiotics?	23	2.7%	237	28.1%	399	47.3%	96	11.4%	88	10.4%
How often do you change antibiotics during the self-medication period	9	1.1%	58	6.9%	205	24.3%	262	31.1%	309	36.7%
How often do you change the dose while self-medicating with antibiotics	11	1.3%	47	5.6%	119	14.1%	258	30.6%	408	48.4%
How often do you carefully read the instructions included before using antibiotics	377	44.7%	161	19.1%	159	18.9%	99	11.7%	47	5.6%
Do you take multiple antibiotics at the same time during a specific infection?	24	2.8%	38	4.5%	154	18.3%	176	20.9%	451	53.5%
Do you choose more expensive or new antibiotics when you are sick?	34	4.0%	74	8.8%	199	23.6%	194	23.0%	342	40.6%
Do you prefer intravenous antibiotics when you are sick	25	3.0%	52	6.2%	173	20.5%	233	27.6%	360	42.7%
How often are antibiotics used to prevent colds	50	5.9%	63	7.5%	215	25.5%	285	33.8%	230	27.3%
Do you store antibiotics frequently?	45	5.3%	95	11.3%	171	20.3%	201	23.8%	331	39.3%

Table 5. Distribution of participants awareness level and attitude towards antibiotic use by their personal data

Personal data		Awareness level		P-value	Attitude level		P-value
		Poor	Good		Negative/ neutral	Positive	
Age in years	< 30 years	92.4%	7.6%	.001*	36.4%	63.6%	.001*
	30-39	85.4%	14.6%		27.1%	72.9%	
	40+	77.3%	22.7%		20.5%	79.5%	
Gender	Male	85.9%	14.1%	.824	28.9%	71.1%	.892
	Female	85.4%	14.6%		28.5%	71.5%	
Nationality	Saudi	85.5%	14.5%	.878	28.6%	71.4%	.796
	Non-Saudi	83.3%	16.7%		33.3%	66.7%	
Educational level	Below secondary	73.2%	26.8%	.011*	31.7%	68.3%	.629
	Secondary	91.2%	8.8%		31.3%	68.7%	
	University/ more	85.0%	15.0%		27.8%	72.2%	
Job	Student	96.5%	3.5%	.001*	33.3%	66.7%	.032*
	Working	87.1%	12.9%		22.5%	77.5%	
	Others	81.1%	18.9%		30.4%	69.6%	
Monthly income	<3000 SR	86.1%	13.9%	.125	27.7%	72.3%	.087
	3000-10000 SR	75.0%	25.0%		38.6%	61.4%	
	> 10000 SR	86.7%	13.3%		46.7%	53.3%	

P: Pearson X2 test * P < 0.05 (significant)

with unclear explanation. Poorly educated persons may be more interested in asking the physician due to inability to understand instructions written with the drugs opposite to the highly educated.

Regarding public attitude and safe practice of antibiotics, the current study revealed that more than 70% of the study participants had a positive attitude towards safe use of antibiotics. Nearly all of the participants agreed on the importance of having additional information regarding the use of antibiotics and that the effectiveness of treatment reduces if the full course of antibiotic therapy is not completed. Also, more than 80% refuted that the treatment can be stopped after one or two days after the improvement of symptoms, and one can self-prescribe antibiotics instead of consulting a doctor when suffering from a minor illness. Besides the study revealed that 70% of the respondents confirmed that reducing the inappropriate use of antibiotics plays an important role in preventing bacterial resistance to antibiotics. These findings were consistent with other similar studies focused on public attitude regarding antibiotic uses [31, 36, 37]. Regarding participants' practice during antibiotic use, the study revealed that there was a discrepancy regarding participants' behaviour as more than 70 of them reported safe behaviours such as reading instructions before having the drug, reporting side effects but also, large proportions reported that they may change more than one antibiotic during their treatment course and changed the dose while self-medicating with antibiotics. These variations in behaviour may be attributed to their poor awareness especially regarding the role of antibiotics in treating viral infections. Participants' practices regarding antibiotics safe use and indications are also affected by their age as the young aged group are more risky for unsafe behaviours, especially females due to the continuous need for antibiotic use for themselves or their children [38].

Conclusions and Recommendations

In conclusion, the study revealed that the population in Aseer region had poor knowledge regarding antibiotic use in total but some of them were knowledgeable regarding th importance of physician prescription and completing the recommended dose. Also, participants' practice was questionable and needs to be improved to adhere to safe practices with antibiotic use. In contrast, participants' attitude was very good as the majority of participants had an acceptable attitude towards antibiotics role in treating infection, proper dose completion, and their need for delivering extra information regarding prescribed antibiotics. More effort should be paid to improve community awareness and practice regarding antibiotics and their proper and effective role if used correctly under physician supervision.

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The Use of Contact Lenses Among Keratoconus Patients in Saudi Arabia: Prevalence, Habits and Complications

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Abstract

Background: Keratoconus (KC) is a progressive, bilateral, asymmetrical condition characterized by corneal ecstasies and a thin, cone-shaped cornea. Keratoconus can affect visual acuity by inducing myopia and irregular astigmatism. Contact lenses (CL) play an important role in the correction of visual problems due to this condition, but pose certain difficulties. The process of contact lens fitting is usually complex and difficult. A major risk factor for adverse contact lens–related events is lack of patient compliance to required hygiene practices.

Aims: To determine the prevalence of contact lens use as well as the attitudes toward contact lens usage and its complications among keratoconus patients.

Methods and Material: This cross-sectional study included 112 keratoconus patients who were treated with contact lenses; subjects were from different areas of Saudi Arabia. A voluntary self-administered questionnaire was used to collect data regarding prevalence, habits and outcomes of contact lens use among keratoconus patients.

Results: Of 112 respondents, 84.8% were treated with hard lenses, while 23.2% used soft lenses. Complications were reported among 57.1%, the most common being dry eyes. Regarding hygiene habits, 66.3% reported washing their hands before wearing their lenses, while 33.7% did not. Moreover, 69% of the participants made sure that there were no scratches or breaks in the edges of the contact lenses before wearing them. The majority of participants reported that they had never slept with lenses on (68.4%), while 13.7% kept their lenses on during naps.

Conclusions: The results of this study highlight negative habits of contact lens use and complications experienced by users. Although the study shows good practice among keratoconus patients, health education on contact lens hygiene is recommended to improve patient behaviour and prevent severe complications. In addition, further research must be undertaken to evaluate the awareness of contact lens related complications among KC patients.

Key words: Contact Lenses Keratoconus Saudi Arabia Eye Hard Soft hygiene wearing

Introduction

Keratoconus is an ophthalmologic condition characterized by a thin cornea with protruding ecstasies, or cones. It is a progressive, bilateral, asymmetrical, and commonly isolated disorder. It can induce myopia and irregular astigmatism which do not improve by wearing spectacles, especially in advanced stages(1,2) . The characteristic sign is the appearance of Vogt's striae, which is produced by the compression of the Descemet membrane and appears as a fine vertical line(3). A recent study estimated the prevalence of keratoconus to be 138:100,000 in the general population(4). Ethnicity and gender have not been proven to be associated, although it most commonly occurs in the second decade of life(1). Despite intensive laboratory and clinical investigations the etiology of keratoconus remains unclear. Both environmental and genetic factors can play major roles in its pathogenesis, and it is believed to be an inheritant disorder(5). Although keratoconus has well described clinical symptoms, it can go unnoticed in early stages if an anterior corneal topography is not performed(2). The most common treatment is contact lenses (CL). If this modality fails, invasive treatments may be performed to rehabilitate vision. These include intrastromal corneal ring segments, corneal cross linking, lamellar or penetrating keratoplasty(1,2). However, patients tend to prefer contact lenses over surgical treatment. The prevalence of using contact lenses in Saudi Arabia for refractive purposes was found to be 19%(6).

The best options of contact lenses are rigid gas permeable (RGP) lenses, hybrid contact lenses, soft toric or spherical lenses, and scleral contact lenses. The process of contact lens fitting is usually complex and difficult for keratoconus patients due to the unique irregularities in each cornea(7). Moreover, studies have shown a lack of awareness among CL users regarding hygiene practices when using contact lens, which may lead to serious complications(8). A limited number of studies have been done to determine the habits of keratoconus patients using contact lenses and their outcomes. This study aims to determine hygiene practices and the outcome of contact lenses among keratoconus patients.

Subjects and Methods

This cross-sectional study targeted keratoconus patients in Saudi Arabia. It was reviewed and approved by the private hospital human research Ethics Committee, and it adheres to the tenets of Declaration of Helsinki. The study was conducted from January 2020 to November 2020. Those included in the study were male and female keratoconus patients aged 18 years and above. The exclusion criteria were those who did not sign the informed consent, and those below 18 years of age. The sample size needed was calculated using OpenEpi v.3 (Mini & Nobili, 2017) to be 81 participants, based on the following parameters: a confidence level of 95%, a margin error of 5%, with the prevalence of keratoconus among Saudi population being 5.56%(9). The data was collected by self-administered questionnaires distributed electronically through social media. The data was analyzed using the Statistical Package for Social Sciences Program (IBM SPSS Statistics, Version 24).

Chi square was used to attain a P-value between dependent and independent categorical data to estimate associations where P-value ≤0.05 is considered significant.

Results

We received 112 responses to our questionnaire, all of whom were diagnosed with keratoconus and were using contact lenses. The majority (59.8%) were males, and 46.4% of the sample were 31 to 40 years old. Sixty-three percent were employed, and 56.3% had university education. Demographics are demonstrated in Table 1.
Some participants reported the usage of different types of lenses during their life. At the time of the study, 84.8% of participants used hard lenses and 23.2% used soft lenses. Most of the sample (83.0%) were diagnosed when they were between the ages of 18 and 30 years, while 13.4% were diagnosed at over 30 years old, and 3.6% at less than 18 years old. Moreover, 59.8% reported that they continuously visited their ophthalmologist, and 72.3% declared that they had a visit during the last year. More than a quarter of the sample reported that their condition worsened with time, while 47.3% indicated that their condition is stable, and 25% did not know if there were any changes (Table 2).

Complications due to contact lens use were reported among 57.1% of the sample. They included dry eye (35.1%), eye redness (22.3%), headache (16.9%), sensitivity (14.2%), and inflammation (11.5%) (Figure 1).

Regarding hygiene practices, 69.4% of participants usually made sure that their lenses had no scratches or breaks before wearing them, with females doing so most frequently (90.3% of females compared to 59.3% of males). Sixty-eight percent of the participants clean their lenses daily, with younger participants reported doing so most often. Most of the sample wash their hands before wearing their lenses, while 66.3% wash their lenses after wearing them. Forty-eight percent reported using special contact lens solutions to clean their lenses, with 41.1% using only water. Forty-seven percent replace their cleaning solution most days, while 40% replacing it daily, and 11.6% doing so rarely (Table 3).

Most of our participants never sleep while wearing their lenses (68.4%), while 13.7% wear them during naps. Younger participants and males were the most common to deny wearing lenses during sleep and while showering. Forty-four percent reported that they had never taken a shower while wearing their lens, and 80% did not wear them while swimming. All participants denied sharing their lenses with others.

More than half the participants (55.7%) do not take a rest in the middle of the day while wearing the lens. The lenses are most commonly worn for 6 -8 hours daily (41.1%), while 22.1% wear their lens for more than 12 hours daily (Table 4).

Table 1: Demographic factors of participants	Variable	Frequency	Percent
Age (years)	18-30	36	32.1
	31-40	52	46.4
	More than 40	24	21.4
Gender	Male	67	59.8
	Female	45	40.2
Marital status	Single	37	33.0
	Married	67	59.8
	Divorced	8	7.1
Profession	Students	16	14.3
	Employee	71	63.4
	Retired	4	3.6
	Other	21	18.7
Educational level	Secondary school	27	24.1
	University	63	56.3
	Higher degree	22	19.6

Table 2: Keratoconus condition of the participants		Frequency	Percent
How old were you when you were diagnosed with keratoconus?	Less than 18	4	3.6
	18-30 years	93	83.0
	More than 30	15	13.4
Your keratoconus condition	Worsened with time	31	27.7
	Is constant	53	47.3
	I do not know	28	25.0
Do you see an ophthalmologist periodically and continuously?	Yes	67	59.8
	No	45	40.2
When was the last time you had an eye exam?	Less than 1 year ago	81	72.3
	Less than 5 years ago	31	27.7

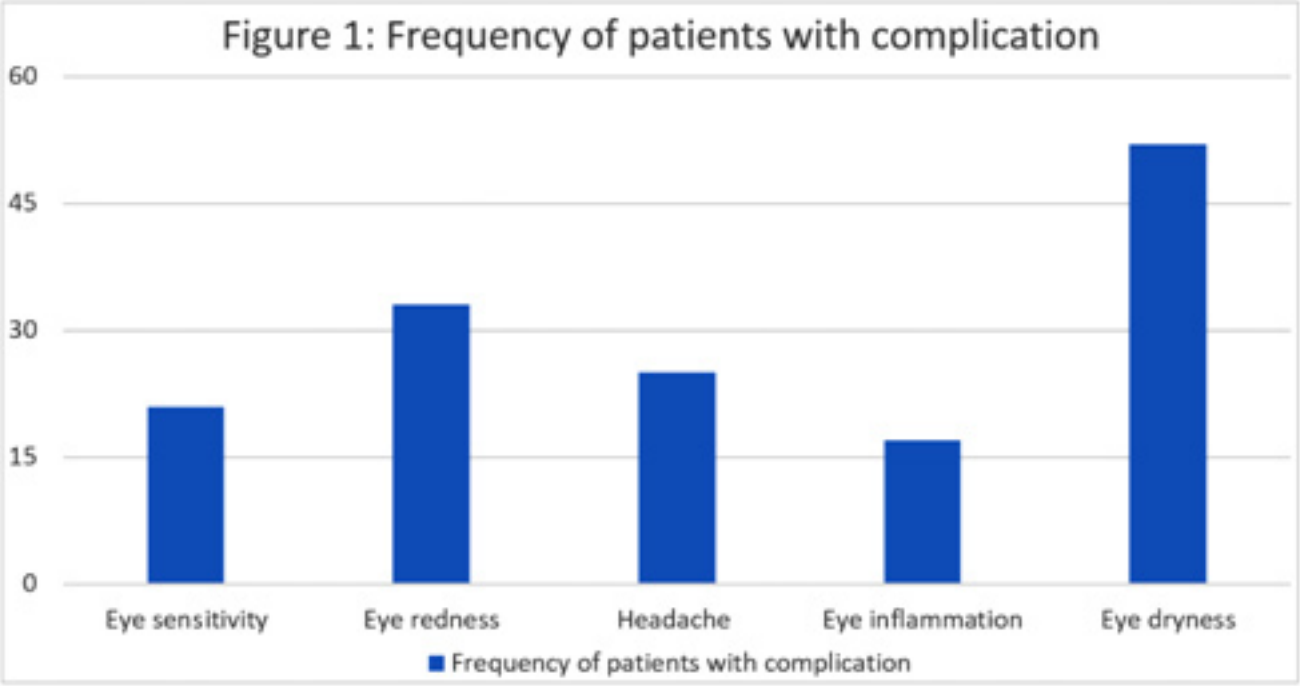

Table 3: Demographic factors and some habits during wearing lens			Age			Gender	
		Frequency	18-30	31-40	More than 40	Male	Female
Do you make sure there are no scratches or breaks in the ends of the contact lens before wearing?	Yes	66 (69.4%)	22 (70.9%)	30 (66.7%)	14 (73.7%)	38 (59.3%)	28 (90.3%)
	No	29 (30.6%)	9 (29.1%)	15 (33.3%)	5 (26.3%)	26 (40.7%)	3 (9.7%)
Cleaning lenses	Daily	65 (68.4%)	24 (77.4%)	28 (62.2%)	13 (68.4%)	43 (67.2%)	22 (71.0%)
	Weekly	18 (18.9%)	5 (16.1%)	9 (20.0%)	4 (21.1%)	11 (17.2%)	7 (22.6%)
	Monthly	8 (8.5%)	2 (6.5%)	4 (8.9%)	2 (10.5%)	6 (9.4%)	2 (6.5%)
	Yearly	2 (2.1%)	0 (0.0%)	2 (4.4%)	0 (0.0%)	2 (3.1%)	0 (0.0%)
	Never	2 (2.1%)	0 (0.0%)	2 (4.4%)	0 (0.0%)	2 (3.1%)	0 (0.0%)
Washing hands before putting on lenses	Yes	90 (94.7%)	31 (100.0%)	41 (91.1%)	18 (94.7%)	60 (93.8%)	30 (96.8%)
	No	5 (5.3%)	0 (0.0%)	4 (8.9%)	1 (5.3%)	4 (6.3%)	1 (3.2%)
Do you wash and clean your lenses after wearing them?	Yes	63 (66.3%)	23 (74.2%)	29 (64.4%)	11 (57.9%)	40 (62.5%)	23 (74.2%)
	No	32 (33.7%)	8 (25.8%)	16 (35.6%)	8 (42.1%)	24 (37.5%)	8 (25.8%)
If the answer to the previous question is yes, how do you wash it?	With the special contact lens solution	63 (94.0%)	22 (91.7%)	28 (93.3%)	13 (100.0%)	38 (90.5%)	25 (100.0%)
	With only water	4 (6.0%)	2 (8.3%)	2 (6.7%)	0 (0.0%)	4 (9.5%)	0 (0.0%)
How do you clean your contact lens case?	With the special contact lens solution	46 (48.4)	15 (48.4%)	24 (53.3%)	7 (36.8%)	31 (48.4%)	15 (48.4%)
	With only water	39 (41.1%)	11 (35.5%)	18 (40.0%)	10 (52.6%)	26 (40.6%)	13 (41.9%)
	With water and soap	7 (7.4%)	3 (9.7%)	2 (4.4%)	2 (10.5%)	4 (6.3%)	3 (9.7%)
	Never wash it	3 (3.1%)	2 (6.5%)	1 (2.2%)	0 (0.0%)	3 (4.7%)	0 (0.0%)
Replacing the cleaning solution	Most days	45 (47.4%)	13 (41.9%)	25 (55.6%)	7 (36.8%)	27 (42.2%)	18 (58.1%)
	Every day	38 (40.0%)	15 (48.4%)	14 (31.1%)	9 (47.4%)	28 (43.8%)	10 (32.3%)
	Rarely	11 (11.6%)	2 (6.5%)	6 (13.3%)	3 (15.8%)	8 (12.5%)	3 (9.7%)
	Never	1 (1.0%)	1 (3.2%)	0 (0.0%)	0 (0.0%)	1 (1.6%)	0 (0.0%)

Table 4: Habits while wearing lens among demographics		Age			Gender	
		18-30	31-40	More than 40	Male	Female
Sleeping with lenses	Never	22 (71.0%)	31 (68.9%)	12 (63.2%)	45 (70.3%)	20 (64.5%)
	Only during naps	5 (16.1%)	6 (13.3%)	2 (10.5%)	5 (7.8%)	8 (25.8%)
	More than once	1 (3.2%)	6 (13.3%)	2 (10.5%)	8 (12.5%)	1 (3.2%)
	Rarely	3 (9.7%)	2 (4.4%)	3 (15.8%)	6 (9.4%)	2 (6.5%)
Sharing lenses	Never	31 (100.0%)	45 (100.0%)	19 (100.0%)	64 (100.0%)	31 (100.0%)
Showering with lenses	All the time	2 (6.5%)	3 (6.7%)	5 (26.3%)	8 (12.5%)	2 (6.5%)
	Frequently	5 (16.1%)	9 (20.0%)	2 (10.5%)	11 (17.2%)	5 (16.1%)
	Sometimes	5 (16.1%)	15 (33.3%)	7 (36.8%)	24 (37.5%)	3 (9.7%)
	Never	19 (61.3%)	18 (40.0%)	5 (26.3%)	21 (32.8%)	21 (67.7%)
Swimming with lenses	All the time	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Frequently	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Sometimes	4 (12.9%)	12 (26.7%)	3 (15.8%)	12 (18.8%)	7 (22.6%)
	Never	27 (87.1%)	33 (73.3%)	16 (84.2%)	52 (81.3%)	24 (77.4%)
Number of hours spent wearing contact lenses	6-8 h	12 (38.7%)	21 (46.7%)	6 (31.6%)	23 (35.9%)	16 (51.6%)
	12h	11 (35.5%)	15 (33.3%)	9 (47.4%)	24 (37.5%)	11 (35.5%)
	Over 12 h	8 (25.8%)	9 (20.0%)	4 (21.1%)	17 (26.6%)	4 (12.9%)
Taking a break from contact lenses for one to two hours after wearing them for about 12 hours	Yes	10 (35.7%)	20 (47.6%)	9 (50.0%)	25 (41.0%)	14 (51.9%)
	No	18 (64.3%)	22 (52.4%)	9 (50.0%)	36 (59.0%)	13 (48.1%)

Discussion

This study set out to determine the attitudes toward contact lens use among keratoconus patients, and to highlight the complications related to their usage. In order to perform that, a survey was distributed among patients with keratoconus who used contact lenses. Although the targeted sample size was 81, we were able to collect a sample of 112 participants with a response rate of 138%. In our study, males represented a higher percentage of the sample than females. While some studies showed similar results,(10) others reported the opposite(11,12). Most of our sample were diagnosed with keratoconus between the ages of 18 and 30 years old, which is similar to other studies where the median age of diagnosis was 22 years old(13).

More than half of the sample reported at least one side effect while using contact lenses, such as dry eye (35.1%), eye redness (22.3%) and headache (16.9%). Similarly, a study which focused on those who wear contact lenses due to a variety of reasons found that half of the participants had at least one complication, most commonly an allergy related to the contact lens or its solution(8).

In our study, dryness of the eye was the most common complication of CLs among KC patients. In contrast, a study was done in Jeddah among the general population and reported side effects among 30%, with red eye and conjunctival inflammation being the most common(14). A higher incidence was reported in Brazil and India(15,16). In the United States, around 30% of CL users experienced side effects that required medical attention(17).

Moreover, wearing contact lenses may be associated with habits that can negatively affect the condition of both keratoconus and the eye itself. In this study, the majority of participants ensured the absence of scratches or breaks in their lenses before wearing them, and most of them reported that they washed their lenses daily. Nearly 94% of participants reported washing their hands before handling their contact lenses, and 66.3% cleaned their lenses after wearing them, most frequently with contact lens solution. In contrast, a study was done in Makkah among college students found that only half of respondents washed their hand before wearing lenses(8). A study conducted in Riyadh reported similar good practice as 89.4% of participants washed their hands before handling contact lenses(6). This variation of the percentage between our study and the earlier findings are perhaps due to differences in target population and wearing purposes.

Moreover, the majority of participants in our study stated that they had never slept with lenses on, while 13.7% kept their lenses on during naps. Conversely negative habits were reported in Jeddah among the general healthy population, where a higher incidence of wearing lenses during sleep was observed,(14) while the incidence was much lower in Riyadh (6). However, a study conducted in the Maldives found a quarter of participants slept overnight or napped while wearing CLs,(18) as did a majority of CL wearers in the United States(17). This might indicate that keratoconus patients have better knowledge on handling CLs than healthy individuals, and it is possible that our participants were instructed properly about contact lens care and they were informed about the consequence of bad practice.

Compared to the US study(17), almost all of our participants stated that they had never shared their lenses with others. The findings in the current study are slightly consistent with the findings of Riyadh study, as 72.4% of participants had never shared their lenses with others (6). In addition, in the present study 55% and 20% reported that they shower and swim with lenses on, respectively. These rates are lower than a study conducted in the United States, but higher than a study in Makkah where around 15% and 7% of participants took showers and went swimming, respectively, with CLs (8). A study conducted in the Maldives found that 35.5% wore CL during showering and swimming(18). The important issue emerging from these findings is that patients need to be educated to avoid exposing contact lenses to any water source, as evidence suggested that risk of infection and inflammatory processes related to contact lenses is higher with exposure to any source of water (19).

Finally, the daily duration of CL use was all day without rest for half of our sample, and 12 hours for 22.1%. However, a study conducted in Thailand with a different target population suggests that wearing contact lenses for a longer period per day is more likely to be associated with significant ocular outcomes for healthy individuals(20). In contrast, KC patients are allowed to use CLs for therapeutic purposes for long period of time per day while taking precautions.

To the best of the authors' knowledge, this is the first study conducted to assess the prevalence, habits and complications of contact lenses use among KC patients. Our study had a few limitations. Although we collected a larger sample than calculated, the sample size was still relatively small due to the difficulty of locating participants who both had keratoconus and wore contact lenses. Around 200 participants were excluded as the inclusion criteria did not apply to them. Another limitation was using a self-reported questionnaire, which could lead participants to answer with what they believed should be the correct answer, and may not reflect their actual habits. Therefore, the same study conducted in a more controlled environment may yield more accurate results.

Conclusion

Many complications of CL have been reported among keratoconus patients, with dry eye, eye redness and headaches being the most common. Although many good practices have been addressed in this study, habits such as swimming and showering while wearing lenses, that may negatively affect the eye, were reported. Finally, we suggest that practitioners educate keratoconus patients more regarding complications related to contact lens use and further research is needed to evaluate awareness about serious ocular complications that are associated with contact lenses.

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Nocturnal Enuresis Pattern and Risk Factors in the Center for Social and Preventive Medicine (CSPM), Cairo University

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Abstract

Background: Nocturnal enuresis is a common disorder in children. Parents' attitudes toward a child's bed-wetting play an important role in treatment.

Aim and objectives: To identify the risk factors and pattern of nocturnal enuresis in the Child Psychiatry Clinic of the Center of Social and Preventive Medicine.

Methodology: This is a cross-sectional study that included 112 nocturnal enuresis patients aged between 5 to 14 years of both sexes in the Child Psychiatry Clinic at Cairo University Hospital. Social data were collected for the studied children and the parents' attitude towards the problem of nocturnal enuresis. Quantitative data were expressed as mean and median, and qualitative data were expressed as absolute frequencies.

Results: The mean age of the patients was found to be 8.6 ± 2.6. The average number of dry nights per week was 1.8. Medicines were used by only 24% of patients. It was also observed that 47% of patients suffered from punishment. Twenty-five percent complained of constipation. Two-thirds of the patients had a positive family history. Learning problems and attention deficit disorder were present in 14 and 12%, respectively. A statistically significant difference was observed between the severity of the condition, drinking after dinner, parental punishment, and constipation (P = 0.04), (P = 0.002) and (P = 0.018), respectively.

Conclusion: Nocturnal enuresis is a common problem that is affected by many risk factors, especially constipation, parental punishment, and drinking liquids after dinner. It turns out that very few patients have learning problems.

Key words: Nocturnal enuresis, wet nights, risk factors.

Introduction

Nocturnal enuresis can be defined as involuntary passage of urine during sleep beyond the age of 5 years, which is the accepted age for normal voiding habits (1).

It is a common disorder in children with a prevalence rate of 20%. (2). Primary nocturnal enuresis means bed wetting in a child aged ≥ 5 years who has never been dry for extended periods, while secondary nocturnal enuresis is bed wetting after a continuous dry period for 6 to 12 months (3).

In most cases the etiology is not completely understood; most studies found that the risk factors for enuresis are family history and lack of family bonding (4), (5). Enuresis is an important problem for both parents and children (6). This includes sleep disturbance, academic disabilities, and neuromotor delay (7). Abnormal vasopressin levels have been described in some studies (8).

Parental attitudes towards a child's bed wetting play an important role in relation to successful treatment and improvement of negative consequences (9).

Few reports have addressed this problem in Egypt. According to a study done in Banha, Egypt, in 2014, a prevalence rate of 14% was recorded. Enuresis was found to be the most common type of behavior disorder among primary school age children 6-12 years (10).

Another study done in Moufeya Governorate, in 2012, showed a prevalence rate of 11.5% for primary nocturnal enuresis (11).

In the present study we aimed to throw some light on epidemiological and risk factors related to this common problem in one of the major teaching hospitals in Egypt. Parents' concerns as well as the child's attitude toward the problem were also enquired about.

Material and Methods

This is a cross-sectional study that was conducted at Kasralainy Hospital addressing attendants of Child Psychiatry clinic during a three months period (April- June 2019).

The study included 112 nocturnal enuresis patients aged between 5 to 14 years.

We included the children with a confirmed diagnosis of primary nocturnal enuresis with 2 or more wet nights per week. Patients with Urinary Tract Infection or diabetic patients were excluded as well as those children whose caregivers refused to participate.

Out of 112 cases, 100 cases fulfilled these criteria. These patients were divided into 2 subgroups: Severe enuresis with 5 or more events per week (n=74) and mild to moderate (n=24).

A questionnaire was designed to elucidate epidemiological factors as well as educational and socioeconomic level of the family. It also included detailed data about attitude and management offered by the parents and risk factors suggested to affect the severity of the problem. Some questions were addressed to the child concentrating particularly on their attitude toward their own problem.

Statistical analysis

All data were statistically analyzed using SPSS 20.0 for windows. Quantitative data were expressed as the mean ± SD & median (range), and qualitative data were expressed as absolute frequencies (number) and relative frequencies (percentage). All tests were two sided. P-value ≤0.05 was considered statistically significant.

Ethical approval:

The study was approved by the Ethical Committee of the Family Medicine Department, Faculty of Medicine, Cairo University. Informed consent was obtained from all participants after simple and clear explanation of the research objectives and methodology.

Results

The mean age of the patients was 8.6± 2.6. Fifty–three % of the patients were females. All families belonged to social class 4 and 5 (12). Most mothers were illiterate or finished primary schools and 5% only finished secondary school.

Table 1 shows the pattern of urinary incontinence It is apparent that most patients have severe incontinence.
Table 2 shows some of the ways used to keep the child dry at night. Different combinations of these methods were used and most of these conditions were not under medical control. It is also noticed that 47% of patients were submitted to punishment.

Twenty four percent of the patients used medical drugs in the past, mainly Uripan (20%) imipramine (4%), and oxybutynin (1%).

Table 3 shows the incidence of risk factors usually described in relation to nocturnal enuresis. Surprisingly, 68% of patients consumed caffeinated drinks. Nearly half of them had infrequent days of incontinence. Accidental fecal incontinence occurred in 12% of patients. Twenty-Five percent complained of constipation. Two-thirds of patients had a positive family history.

As shown in Table 4, learning problems and attention deficit disorder were present in 14 and12% respectively. Sleep problems were present in 16 patients.

In Table 5, we assessed the attitude and awareness of children with their problem where 96 % considered the condition as a problem. Disturbance of sleep, embarrassment on vacations, getting teased and parent's upset were the most common answers. However only 15% felt bad about themselves.

In Table 6 a statistical evaluation of different risk factors was performed. A statistically significant difference was observed between case severity and drinking after dinner, parent punishment and constipation (P=0.04), (P=0.002) and (P= 0.018) respectively.

Table 1: Basic characteristics of the study group regarding urination control (n=100).

Items	Mean± SD (Range)
1. How old were you when you started urinating in the toilet during the day? (years)	2.5±0.9 (1-6)
2. How many nights each week do you *usually* stay dry? (nights)	1.8±1.8 (0-6)
3. What is the longest you have ever been dry every night in a row? (days)	6.7±11.9 (0-60)

Table 2: Assessing ways used to keep the child dry at night (n=100)

Items	Study group (n=100)	
	No	%
Diaper or "Pull-up"	26	26.0
Drinking little or less after dinner	48	48.0
Alarm Clock wakes at night	27	27.0
Acupuncture/Acupressure	0	0
Trying to remember to keep dry	57	57.0
Enuresis Alarm	4	4.0
Hypnosis	0	0
Keeping "Dry Night" calendar	30	30.0
Parent wakes at night	93	93.0
Punishment for wet nights	47	47.0
Rewards for dry nights	57	57.0

Table 3: Assessing risk factors that may be associated with nocturnal enuresis (n=100)

Items	choice	Study group (n=100)	
		No	% (100.0)
6. Do you sometimes drink caffeinated drinks (soda, tea, coffee) during or after dinner?	Yes	68	68.0
	No	32	32.0
7. When you need to urinate during the day, do you have to go right away?	Yes	57	57.0
	No	43	43.0
8. Do you sometimes urinate in your clothes by accident during the day?	Yes	48	48.0
	No	52	52.0
If "Yes" how many times each week?	1	17	17.0
	2	6	6.0
	3	9	9.0
	4	7	7.0
	7	13	13.0
9. Do you sometimes have a bowel movement (BM, "poop") in your clothes by accident during the day?	Yes	12	12.0
	No	88	88.0
If "Yes" how many times each week?	1	7	7.0
	2	6	6.0
	4	1	1.0
	6	2	2.0
	7	2	2.0
10. Is it hard for you to have a bowel movement most days?	Yes	25	25.0
	No	75	75.0
11. Do you take any medicine to help you have bowel movements most days?	Yes	2	2.0
	No	98	98.0
14. Did either of your parents, or any uncles, aunts or cousins have enuresis as a child?	Yes	67	67
	No	33	33

Table 4: Assessing medical condition that may be associated with nocturnal enuresis (n=100)

Items	choice	Study group (n=100)	
		No	%
12. Do you have any other medical or health problems?	Yes	87	87.0
	No	13	13.0
If the answer is yes,			
• Learning problems		13	13.0
• Attention Deficit Hyperactivity Disorder (ADHD)		12	12.0
• Diabetes		1	1.0
• Constipation		5	5.0
• Kidney/bladder problems		0	0
• Bladder infections		0	0
• Allergies: to what?		13	13.0
• Sleep problems		16	16.0
• Seizures		4	4.0
13. Do you take any other medicines?	Yes	10	10.0
	No	90	90.0
If "Yes," what medicine?			
L- thyroxine		4	4.0
Drugs for hepatomegaly		2	2.0
Metronidazol		2	2.0
Aripeprix for autism		1	1.0
Depakin for seizures		1	1.0

Table 5: Assessing awareness of children with nocturnal enuresis toward this problem (n=100)

Items	choice	Study group (n=100)	
		No	%
Is enuresis a problem for you?	Yes	96	96.0
	No	4	4.0
If the answer is yes,			
Why it is a problem for you:			
• Can't do sleep-overs		77	77.0
• Embarrassing on vacations		70	70.0
• Have to wash my sheets/pajamas a lot		6	6.0
• Getting teased		74	74.0
• Parents are upset		73	73.0
• Don't like wearing diapers		18	18.0
• Can't get a new bed		28	28.0
• Don't feel good about myself		15	15.0

Table 6: Comparing between level of severity and different factors (n=124).

Characteristics	Mild (n=26)	Moderate and severe(n=74)	P value
	No	No	
Gender			
Male	11	36	0.57
Female	15	38	
Diaper or "Pull-up" use			
No	22	52	0.15
Yes	4	22	
Drinking little or less after dinner			
No	18	34	**0.04***
Yes	8	46	
Trying to remember to keep dry			
No	10	33	0.58
Yes	16	41	
Punishment for wet nights			
No	18	25	**0.002****
Yes	8	49	
Drink caffeinated drinks			
No	17	51	0.74
Yes	9	23	
Urinate in your clothes by accident during the day			0.81
No	13	35	
Yes	3	39	
Sometimes have a bowel movement (BM, "poop")			
No	2	10	0.43
Yes	24	64	
Hard for you to have a bowel movement			
No	11	14	**0.018***
Yes	15	60	

*Statistical significance P≤ 0.05

Discussion

Demographic data obtained showed an age range between 3 and 14 years with no statistical significance regarding sex but with female predominance, although male predominance is described in most research (4), (13).

Out of 100 children who completed this study after application of our exclusion criteria, 74% had severe incontinence. This was shown in other studies (13,14). We also noticed that the level of the mother's knowledge, attitude, and practice towards the problem was unsatisfactory. This can be shown by the ways used to keep the child dry at night. Analysis of the results of our questionnaire showed for example: pull ups were used at night by only 26% of cases; nearly 50% of cases were not aware of the importance of preventing drinking after dinner; enuresis alarm was used by only 4%. This may be due to the relatively high cost of this device. Also punishment for wet nights was performed for nearly 60%. The effect of punishment, especially physical punishment on the severity of enuresis and sometimes failure of treatment has been documented in several studies (9). It is common in low socioeconomic families as in our study.

The problem severity was affected by many risks. It was noticed that factors like patients' gender, family history of enuresis, presence of constipation and obstructive sleep apnea could affect the problem as well as the socioeconomic factors, knowledge and attitude of parents, that were proved to be of significant effect also in other studies (13), (14).

In our study most of these factors were shown to be of value as regards severity of the problem. However, drinking after dinner, punishment for wet nights and associated constipation proved to be of statistical significance.

We tried to assess the awareness of children and their attitude towards the problem. With some difficulty, mostly due to some sort of embarrassment, we concluded that the problem deeply affected the great majority of them. Thus, nearly a quarter of them presented with problems like failure to do sleepovers, embarrassment on vacation and getting teased. Upset of parents and fear of punishment were also relevant. Fifteen percent of parents stated that they don't feel good about themselves.

We recommend that a health educational program should be developed for caregivers of children with enuresis to update their knowledge and skills about this common problem. Mass media, posters and individual counseling can help in this field. Maternal and child health centers (MHC) should participate in early counseling and directions to mothers regarding toilet training and basics of management.

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Knowledge and Attitude of Basic Life Support Among Medical Students at Al-Imam Muhammad Ibn Saud Islamic University in Riyadh, Saudi Arabia

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Abstract

Introduction: Basic life support (BLS) is essential since it increases the survival rate in emergency situations. The aim of this study is to measure the knowledge and attitude towards BLS among medical students at Al-Imam Muhammad Ibn Saud Islamic University (IMSIU).

Methods: This cross-sectional study recruited a total of 281 Saudi students of both genders at the college of medicine of IMSIU-Riyadh, from the preparatory year to the fifth year. Participants completed a validated English questionnaire between December 2018 and January 2019. The questionnaire included 27 questions in total divided into 21 questions that assessed BLS knowledge and skills of medical students and six questions that assessed the attitude towards BLS.

Results: A total of 280 students completed the questionnaire. Males constituted the majority of participants (57.1%). The overall mean score for BLS knowledge was very poor (29.96%, SD±14.67). In addition, 40% of students had never received BLS training before. It was also noted that about 76% of students desired more BLS training and about 78% of them thought BLS training should be mandatory. Moreover, 43% of medical students suggested that BLS training should be first provided in high school.

Conclusion: The outcome indicates very poor knowledge of BLS among medical students of IMSIU, which mandates more BLS training. Despite the numerous students' failure to show acceptable knowledge on BLS training, a good attitude is observed. These findings encourage more improvement in BLS education among IMSIU students to guarantee better outcomes during emergency situations.

Key words: BLS; Basic life support; Knowledge; Attitude; Riyadh; Saudi Arabia

Introduction

Cardiac arrest and accidental injuries are major health problems that every healthcare worker must be prepared to intervene in appropriately. To do so, the provider must be aware of the types of emergency medical care including basic life support (BLS). BLS aims to provide basic medical care to patients until they receive the proper medical care at a hospital [1]. Multiple studies have proven the importance of BLS on mortality reduction. In the cases of cardiac arrest, proper BLS intervention in the first few minutes may double or triple a person's survival rate [1,2]. Every minute counts for patients who suffer cardiac events, that is to say, every minute that passes with no intervention may negatively affect and reduce BLS's effectiveness [3]. Cardio-respiratory resuscitation is usually successful when the arrest is due to cardiac causes; however, in non-cardiac causes such as septic shock and multiple organ failure that is not usually the case [4,5].

Overall, many studies illustrate the importance and effectiveness of BLS in saving lives, in addition to reinforcing its application through trained general population volunteers [2]. The global literature assesses and looks abundantly at the extent of knowledge of BLS training in health professionals, yet it doesn't seem to be the standard practice in Saudi Arabia. For example, plenty of studies have been reported in India that measure the attitude and knowledge of different healthcare providers [6-8]. The same studies have also been conducted in Pakistan, Netherlands, New Zealand, and Ireland [9-13]. Furthermore, in some countries like Croatia and Norway, BLS measurements have reached school levels [14,15]. On the other hand, BLS has not been the main concern in Saudi Arabia. With the exception of the capital, Riyadh, only three studies have been conducted to assess BLS training in Saudi Arabia's different schools. They assessed BLS training at Qassim University in Qassim, King Khaled University in Abha, and Tabuk University in the northern region [16-18]. Whereas in Riyadh, multiple studies including those performed in secondary school settings have been published [19-23]. The latest study in Riyadh was conducted at Princess Nourah bint Abdulrahman University (PNU) [23]. Unfortunately, all previous studies concluded that future healthcare providers lacked knowledge about BLS. The studies did reflect, however, a positive attitude of participants to take part in additional BLS training. In this study, we aimed to measure the knowledge and attitude towards BLS among medical students at Al-Imam Muhammad Ibn Saud Islamic University (IMSIU).

Methods

This study was designed as a prospective cross-sectional study to assess the knowledge and attitude of medical students using a self-administered questionnaire. It was conducted between 2 December 2018 and 2 January 2019. The appropriate sample size was calculated to be a total of 281 participants from the college of medicine in IMSIU-Riyadh with a 5% margin of error and a confidence level of 95% [24]. The participants comprised both Saudi male medical students from the preparatory year to the fifth year and Saudi female students limited to the third year only; all students participated voluntarily.

A self-administered English questionnaire was used as a tool for data collection. It was tested for validity and reliability by the source [23]. Participants were recruited by a non-probability consecutive sampling technique. The selection criteria included Saudi students of both genders at the college of medicine of IMSIU-Riyadh from the preparatory year to the fifth year, who willingly accepted to take part in the study. No exclusion criteria was set.

The questionnaire consisted of 27 questions separated into two sections. The first section included 21 multiple-choice questions and was used to estimate medical students' BLS knowledge and skills; the second section included six multiple-choice questions which assessed their attitudes towards BLS. In addition, demographic information such as gender and year of study was obtained. The first section was accompanied by an answer key developed from the original questionnaire to help with data collection and scoring. The results were analyzed and recorded as percentages which were calculated from the participants' correct answers. Accordingly, knowledge levels were classified as excellent (90–100%), very good (80–89%), good (70–79%), acceptable (60–69%), poor (50–59%), and very poor (< 50%). The remaining six questions evaluating attitude were presented as mean, standard deviation and percentages. After collecting the data, the analysis was carried out by the SPSS software package. Descriptive mean and standard deviation measures were used for quantitative data like knowledge and attitude, while percentages and numerical values were used for categorical data like gender, year of study, and college. Regarding inferentials, a chi-square test, Fisher's exact, ANOVA, and Tukey's tests were used to find the correlation between the outcomes and the variables. A test was considered significant if p value was less than 0.05.

A consent form stating the nature and purpose of the study was completed beforehand by each participant. Also, the identification information of the participant was coded to ensure confidentiality and anonymity. The approval to conduct this study was obtained on 13 November 2018 from the Institutional Review Board of the Al-Imam Muhammad Ibn Saud Islamic University in Riyadh, Saudi Arabia.

Results

A total number of 280 students from all years of medical college completed the questionnaire; only one participant was excluded due to being non-Saudi, representing a response rate of 99.4%. Males had the majority of participation and constituted of a total number of 160 students (57.1%). The number of students who participated according to each year is shown in Table 1.

The overall mean score for knowledge was 29.96% with a standard deviation (SD) of ± 14.67. The mean knowledge score for males was 29.76% (SD ± 15.01) which was slightly lower than the females' score (30.24%, SD ± 14.27); however, that value was proved to be insignificant. When the data was analyzed by the year of study, it was shown that the preparatory year students had a lower mean compared to other years (23.34%, SD ± 13.14). Fifth-year students had a mean knowledge score of 47.4% (SD ± 17.04), which was greater than the mean knowledge scores of the preparatory, first-, second-, third- and fourth-year students (23.34% ± 13.14, 7.86% ± 13.79, 28.02% ± 11.98, 32.08% ± 14.06, 35.82% ± 10.49, respectively). Fifth-year students' mean score also showed a statistically significant difference when compared to all years excluding the fourth-year students' mean score ($p < 0.001$). The percentage of correct responses to the knowledge section of the questionnaire is displayed in Table 2. Moreover, 40% of participants had never received any previous BLS training at all. The majority of the students, however, desired more BLS training (75.7%) and almost 78% of medical students thought BLS training should be mandatory. A total of 42.9% of students wanted BLS training to be provided in high school [Table 3].

Our participants have conducted their training in different locations which were categorized into groups that included college (34.7%, SD ± 16.4), outside of college (43.8%, SD ± 14), both in and outside of college (33.6%, SD ± 16.9), and those who had no training at all (29.5%, SD ± 11.4) [Table 4]. Those who formerly received BLS training outside of college performed significantly better compared to those who trained in college, students who had BLS training both in and outside of college and students that never received any BLS training at all ($p = 0.027$, $p = 0.037$, and $p < 0.001$, respectively). Ninety-six percent of students who never received any BLS training desired further BLS training compared to 79.2% of the students who previously had BLS training ($p <0.001$). Furthermore, students without previous BLS training preferred earlier training, such as that it would be first provided in high school or first year of college, as compared to students with past training. Finally, there was no significant difference among the groups when asked about the appropriate year for BLS training provision [Table 5].

Table 1: Characteristics of respondents

		N (%)
Study year	Preparatory Year	61 (21.8)
	1st Year	54 (19.3)
	2nd Year	61 (21.8)
	3rd Year	61 (21.8)
	4th Year	21 (7.5)
	5th Year	22 (7.9)
Gender	Male	160 (57.1)
	Female	120 (42.9)

Table 2: Frequency of correct responses to questionnaire items assessing BLS knowledge among Imam Muhammad Ibn Saud Islamic University's medical students.

Correct responses	N (%)
EMS stands for emergency medical services	132 (47.1)
CPR stands for cardiopulmonary resuscitation	179 (63.9)
If a 50-year-old man complains of retrosternal chest pain and nausea, contact EMS, administer aspirin and allow him to rest	102 (36.4)
If a colleague displays slurring of speech and right upper limb weakness, it could be a stroke which would require thrombolysis, so you should contact EMS	78 (27.9)
If you see a person collapse on the road, check if he is conscious, breathing and has a pulse	193 (68.9)
To find out if a person is unconscious, shake them and shout at them	46 (16.4)
To find a person's carotid pulse, feel their neck	163 (58.2)
After confirming that a person is unconscious, not breathing and has no pulse, you should contact EMS	33 (11.8)
The phone number for EMS is 997	201 (71.8)
The location of chest compressions in CPR is the mid-chest	110 (39.3)
The correct rate of chest compressions for adults and children is 100–120 times/minute	69 (24.6)
The correct depth of chest compressions for adults is 5–6 cm	51 (18.2)
The correct ratio of chest compressions to rescue breaths is 30:2	66 (23.6)
The correct depth of chest compressions for children and infants is at least two-thirds of the depth of the chest	10 (3.6)
The correct location for chest compressions for infants is one finger breadth below the nipple line	42 (15)
Rescue breathing in infants is given mouth-to-mouth and mouth-to-nose	48 (17.1)
If you do not want to give mouth-to-mouth CPR, not administering CPR is not an appropriate course of action	61 (21.8)
The chance of survival for individuals experiencing an out-of-hospital cardiac arrest increases two-fold if the patient receives sufficient BLS before the arrival of EMS personnel	20 (7.1)
If you come across an unresponsive adult who has been removed from fresh water and is breathing spontaneously, keep him in the recovery position	34 (12.1)
If someone appears to be choking, confirm foreign body aspiration by talking to them	22 (7.9)

EMS = emergency medical services;
CPR = cardiopulmonary resuscitation;
BLS = basic life support.

Table 3: Respondents' attitude towards basic life support training

	N (%)
Have you had previous BLS training?	
Yes, in college	32 (11.4)
Yes, outside college	37 (13.2)
Yes, in and outside college	19 (6.8)
No	112 (40.0)
Don't know	80 (28.6)
Do you want more BLS training?	
Yes	212 (75.7)
No	28 (10.0)
Don't know	40 (14.3)
If yes, why do you want more BLS training?	
Heart diseases within family	20 (7.1)
Wish of avoiding unnecessary death in the community	112 (40.0)
Important for my future work	76 (27.1)
Other reasons	14 (5.0)
No answer	58 (20.7)
If you have had no BLS training outside of college, what was the reason?	
Little interest	22 (7.9)
Little time	60 (21.4)
Not sure where to attend course	80 (28.6)
Costs	24 (8.6)
No answer	94 (33.6)
Do you think BLS training should be mandatory and, if so, where should it be provided?	
Yes, in health college only.	33 (11.8)
Yes, in all colleges.	81 (28.9)
Yes, training should be included in all occupations.	103 (36.8)
No, BLS training should be optional.	13 (4.6)
Don't know	50 (17.9)
When do you think BLS training should first be provided?	
In high school	120 (42.9)
First year in college	73 (26.1)
3rd year in college	38 (13.6)
Just before graduation	10 (3.6)
I don't know	39 (13.9)

BLS = Basic life support

Table 4: BLS knowledge levels and scores according to previous training history among Imam Muhammad Ibn Saud Islamic University's medical students

Previous training	Mean (SD)	P-Value	Good N (%)	Acceptable N (%)	Poor N (%)	Very Poor N (%)	P-Value
In college	34.7 (16.4)	<0.001	0 (0)	2 (6.3)	3 (9.4)	27(84.4)	<0.001
Outside college	43.8 (14)		2 (5.4)	3 (8.1)	7 (18.9)	25(67.6)	
Both in and outside college	33.6 (16.9)		0 (0)	0 (0)	4 (21.1)	15(78.9)	
No training	29.5 (11.4)		1 (0.9)	0 (0)	4 (3.6)	107(95.5)	
Don't know	21.5 (12.1)		0 (0)	2 (2.5)	0 (0)	78(97.5)	

Discussion

The aim of this paper was to measure the knowledge and attitude towards BLS among medical students at Al-Imam Muhammad Ibn Saud Islamic University (IMSIU). The male to female ratio was considered sufficient at a ratio of 1.3 to 1. Although multiple college levels took part in this study, the number of participants from each year was almost similar, which therefore added verity to the sample.

Globally, multiple studies have been conducted in regards to BLS training of healthcare workers, however that does not seem to be the case in Saudi Arabia. This study reflected the positive attitude of medical students at IMSIU and their willingness to receive additional BLS training which was similarly observed in previous BLS knowledge and attitude studies in Saudi Arabia. This desire to gain knowledge should be embraced and utilized for the good of the students. On the other hand, the observed low scores in the knowledge section of the questionnaire were classified as very poor, which also resembled previous studies in Saudi Arabia [6-23]. In this study, only three students achieved a "Good" score, yet none achieved a full score. Interestingly, similar studies published in Europe showed similar unsatisfactory outcomes. A study across the UK which included 21 medical schools revealed profound disparity among the students' responses with cumulative evidence of poor factual knowledge about BLS, yet the students were also eager to learn [25]. The low performance in this study could be attributed to the following reasons. First, the absence of a BLS course in the IMSIU as a mandatory part of the curricula in the early years could have had a negative impact, even though BLS training during medical school is highly encouraged. Nonetheless, the BLS provider certificate is a requirement for the surgery block in the fourth year, which could explain the gap in the average of BLS scores between fourth- and fifth-year students and their younger peers. The second issue is the lack of knowledge retention or shortage of sufficient educational reinforcement which may cripple the competency of BLS [23]. Chest compressions and breathing ratio are two crucial components of BLS; however, it was shown that students had a concerning response and a lack of knowledge in questions regarding the correct rate of chest compressions with 75% of participants not knowing the correct answer, the depth of compression with 82% of them not knowing the correct answer, and the ratio of chest compression to breath with 76% of them not knowing the answer. This observation is alarming considering that almost half of the participants have had previous BLS training (44%). Furthermore, the students who took BLS courses outside of college scored significantly higher than their peers who took the course in the college itself. In light of that, this area of limitation needs more research to identify the causes of inexperience and address them to promote better training for those inside the college. Accordingly, training could be simplified to the basics of BLS training that have critical value to the safety of patients [26]. Furthermore, evolving technologies can be utilized in the medical education system to provide virtual BLS courses and improve their accessibility [27].

Ultimately, this study depicts students who were eager to learn but had poor BLS knowledge; thus, integrating a proper BLS course as part of the college curricula in the early years, in addition to frequent refreshing courses during medical school is recommended to improve the knowledge acquisition and retention [13,26-29]. This paper has several limitations that have been accounted for. [30] One of the limitations is that the study's design provided only a snapshot of the students at that specific time. In addition, the questionnaire was conducted without any practical assessment, sessions on manikins or real-life practice; therefore, it does not reflect the real BLS skills among the students. We suggest that future research addresses the assessment of practical skills appropriate for BLS. This study would help in the future enhancement of coaching classes about BLS within the educational curriculum.

Table 5: Attitude to BLS according to previous training history among Imam Muhammad Ibn Saud Islamic University's medical students

	Previous training N (%)					P-value[$]					
	In college	Outside college	In and outside college	Any previous training	No training	P1[†]	P2[‡]	P3[§]	P4[¶]	P5[††]	P6[‡‡]
Do you want (more) BLS training?											
Yes	18(62.1)	28(90.3)	15(88.2)	61(79.2)	101(96.2)	<0.001	<0.001	0.196	0.014	0.09	<0.001
No	11(37.9)	3(9.7)	2(11.8)	16(20.8)	4(3.8)						
Do you think BLS training should be mandatory?											
Yes	28(93.3)	33(94.3)	18(94.7)	79(94)	101(95.3)	0.979	0.85	0.919	0.874	0.84	0.752
No	2(6.7)	2(5.7)	1(5.3)	5(6)	5(4.7)						
When do you think BLS training should be given?											
High school or 1st year of college	23(82.1)	30(83.3)	13(68.4)	66(79.5)	88(83)	0.493	0.486	0.201	0.9	0.279	0.575
3rd year of college or just before graduation	5(17.9)	6(16.7)	6(31.6)	17(20.5)	18(17)						

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Public's knowledge regarding impact of advanced paternal age on offspring's health

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Abstract

Aim of Study: To assess knowledge of the population in Saudi Arabia about health hazards affecting the offspring of fathers with advanced age at the time of conception.

Methods: This is a nationwide study that included 1,218 adults living in Saudi Arabia. A study questionnaire was designed for online data collection using the "Google Forms".

Results: Almost half of participants were males (49.4%), age of 60.3% was 20-40 years, 22.2% were working in the health sector, while 34.4% were working in other sectors. The majority of participants (93.7%) were Saudi, and 52.7% were married. Only 19% stated that advanced paternal age is above 40 years, 54.4% were aware that aged mothers have more impact on their offspring's health, 73.3% considered that age at marriage is increasing in the community, while 85.5% considered that there is a need to raise the public's awareness about the baby's health problems associated with fathers' ageing. Only 12% of participants had poor knowledge about possible impact of advanced father's age on offspring's health. Participants' knowledge about impact of father's age on his offspring's health differed significantly according to their age, with those aged above 40 years having the least proportion of good knowledge (9.0%, p=0.007) and also differed with their employment status, with those employed at other than health sectors having the least proportion of good knowledge (7.6%, p=0.001).

Conclusions: The public in Saudi Arabia mostly have poor knowledge about impact of advanced paternal age on offspring's health. Most of them feel the need to raise their awareness about offspring's health problems associated with father's ageing. It is recommended to raise their awareness regarding the fact fathers, mostly after the age of 40 years, experience decreased fertility, and constitute a high risk for congenital malformations among their offspring. Couples must be counselled on the impact of advanced paternal and maternal ages on negative pregnancy outcomes and impaired offspring health.

Key words: Advanced paternal age, risk factors, congenital malformations, knowledge.

Introduction

For many years, advanced maternal age was blamed for the incidence of many syndromes among their offspring. This blame was based on strong evidence. However, the effect of advanced paternal age on offspring was not under focus, despite the increasing average paternal age (1).

There is no universally accepted definition for "advanced paternal age", but father's aged 40 years or older at the time of conception was frequently used (2). The possible impact of the relation between advanced father's age and the incidence of health hazards among his offspring is not fully understood. Nevertheless, this may be attributed to new gene mutation secondary to the large number of self-deviations in spermatogenesis (3). Autosomal dominant mutations were estimated to be 0.5% among offspring of fathers aged older than 40 years (4).

In USA, the crude incidence rates for birth defects (per 10,000 births) among offspring of fathers with advanced paternal age were reported to vary according to type of birth defects, such as: anencephaly (1.21), spina bifida (3.32), encephalocele (0.75), ventricular septal defect (50.03), atrial septal defects (49.35), cleft lip with or without cleft palate (9.34), pyloric stenosis (13.71), craniosynostosis (5.35), gastroschisis (0.38), trisomy 21 (Down syndrome) 31.72, trisomy 13 (Patau syndrome) 0.90, and trisomy 18 (Edwards syndrome) 4.82 (5). However, no study has estimated prevalence of birth defects among offspring of fathers with advanced paternal age in the Kingdom of Saudi Arabia (KSA).

Other than birth defects, studies indicated that advanced paternal age is associated with 14% higher odds of premature birth, 18% of seizures, early childhood mortality (6), cerebral palsy (7) and some cancers, e.g., CNS neoplasms, acute lymphoblastic leukemia, acute myeloid leukemia (8). Therefore, impact of advanced paternal age at the time of conception on offspring is not negligible, and it might reach up to the risk of Down syndrome reported among 35-40-year-old mothers (9).

To the best of the researchers' knowledge, no previous studies were conducted in KSA aiming to assess the association between advanced fathers' age with health hazards among their offspring. Therefore, it is necessary to explore the public's knowledge about this important health issue. Results of this study are expected to encourage healthcare planners toward educating the public to avoid the possible health hazards among offspring of fathers with advanced age.

Aim of study

To assess knowledge of the population in Saudi Arabia about health hazards affecting the offspring of fathers with advanced age at the time of conception.

Subjects and Methods

This research is a nationwide study that included adults (aged above 18 years) living in all 13 administrative regions of Saudi Arabia.

After thorough review of relevant literature, a study questionnaire was constructed by the researchers for data collection. It included two parts; the first part comprised personal characteristics (age, gender, educational status, employment, income and marital status), while the second part included 15 statements related to participants' knowledge about the possible impact of advanced parents' age on health of offspring. A pilot study was conducted on 50 participants. Test-retest reliability was assessed. In addition the internal consistency was evaluated using Cronbach's alpha coefficient, which was 0.82. The questionnaire was then designed into online "Google Forms".

A score of "1" was assigned to each correct response, while a score of "0" was assigned to each incorrect (or do not know) response. Scores of all responses were summed up to obtain participants' total knowledge scores (with a minimum of 0 and a maximum of 15). Participants with total scores >8 were considered to have "Good Knowledge", while participants whose knowledge scores were <7 were considered to have "Poor Knowledge".

The minimum sample size was calculated using the Raosoft Sample Size Calculator Website (10), with 3% margin of error, 95% confidence level and 50% response distribution, to be 1,068. The study questionnaire was distributed according to a simple random sampling technique with proportional allocation to 1500 persons in all 13 Saudi Regions. However, only 1,218 responses were received (i.e., 81.2% response rate).

All data were cleaned for any duplication or incompleteness. The Excel spreadsheet data file was exported to the Statistical Package for Social Sciences (IBM, SPSS, version 25) file. Study variables were summarized and reported in terms of frequency distributions and percentages. All independent variables were compared across participants' knowledge grades using the Chi-Square test. P-values <0.05 were considered statistically significant.

Participants' data were kept confidential and were not used expect for research purposes. The ethical approval for conducting this study was obtained from the Institutional Review Board (IRB) in the Abha Maternity and Children Hospital, Saudi Ministry of Health.

Results

Table 1 shows that almost half of participants were males (49.4%). The age of 60.3% was 20-40 years. More than half of them (55.9%) were university educated. Approximately lmost one-fifth of participants (22.2%) were working in the health sector, while 34.4% were working in other sectors. The monthly income of 31.7% of participants' was 3,000-10,000 Saudi Riyals, while that of 39.8% was more than 10,000 Saudi Riyals. The majority of participants (93.7%) were Saudi, and 52.7% were married.

Table 2 shows that 36.8% of participants believed that advanced fathers' age is above 60 years, while 39.1% believe that it is above 50 years, while only 19% stated that it is above 40 years. More than half of participants (54.4%) were correctly aware that aged mothers have more impact on their offspring's health. Almost three-quarters of participants (73.3%) considered that age at marriage is increasing in the community, while 85.5% considered that there is a need for raising the public's awareness about offspring's health problems associated with father's ageing.

Table 3 shows that only 31.9% of participants correctly knew that advanced father's age affects his offspring's health. Regarding the association between father's aging and baby's morbidity, 19.2% knew its association with congenital heart disease, 12.2% knew its association with congenital hare lip, 25.2% knew its association with Down syndrome, 14.9% knew its association with congenital head deformities, 13.7% knew its association with epilepsy, 10.8% knew its association with cerebral palsy, 9.4% knew its association with brain tumors, 12% knew its association with blood diseases, and 20.4% knew its association with autism.

Figure 1 shows that only 12% of participants had good knowledge about possible impact of advanced father's age on offspring's health.

Table 4 shows that knowledge about impact of father's age on his offspring's health differed significantly according to participants' age, with those aged above 40 years having the least proportion of good knowledge (9.0%, p=0.007). Participants' knowledge also differed significantly according to their employment status, with those employed at other than health sectors having the least proportion of good knowledge (7.6%, p=0.001). However, participants' knowledge did not differ significantly according to their gender, educational status, monthly income, nationality or marital status.

Table 1: Personal characteristics of participants (n=1218)

Personal characteristics	No.	%
Gender		
• Male	602	49.4
• Female	616	50.6
Age group		
• <20 years	250	20.5
• 20-40 years	735	60.3
• > 40 years	233	19.1
Educational status		
• Primary/Intermediate	37	3.0
• Secondary	381	31.3
• University	681	55.9
• Postgraduate	119	9.8
Employment status		
• Unemployed	528	43.3
• Health sector	271	22.2
• Not health sector	419	34.4
Monthly income		
• <3000 SR	347	28.5
• 3000-10000 SR	386	31.7
• >10000 SR	485	39.8
Nationality		
• Saudi	1141	93.7
• Non-Saudi	77	6.3
Current marital status		
• Married	642	52.7
• Single	576	47.3

Table 2: Participants' knowledge regarding impact of parent's age on offspring's health

Knowledge statements	No.	%
Is age at marriage increasing in the community?		
• Yes	893	73.3
• No	182	14.9
• Do not know	143	11.7
At what age can fathers be considered as "advanced paternal age"?		
• >40 years	231	19.0
• >50 years	476	39.1
• >60 years	448	36.8
• Do not know	63	5.2
Which parent's age at conception has more impact on baby's health?		
• Mothers > fathers	662	54.4
• Fathers > mothers	28	2.3
• Both parents are equal	321	26.4
• Do not know	207	17.0
Is it necessary to raise public's awareness about possible hazards of conception associated with advanced paternal age?		
• Yes	1041	85.5
• No	54	4.4
• Do not know	123	10.1

Table 3: Participants' knowledge regarding impact of father's advanced age at conception on his offspring's health

Knowledge items	Yes		No		Do not know	
	No.	%	No.	%	No.	%
Does advanced father's age at conception affect his offspring's general health?	389	31.9	473	38.8	356	29.2
Does advanced age of fathers increase incidence of any of the following among offspring:						
• Congenital anomalies	285	23.4	450	36.9	483	39.7
• Congenital heart disease	234	19.2	415	34.1	569	46.7
• Congenital harelip	148	12.2	436	35.8	634	52.1
• Down syndrome	307	25.2	385	31.6	526	43.2
• Congenital head deformities	181	14.9	418	34.3	619	50.8
• Epilepsy	167	13.7	429	35.2	622	51.1
• Cerebral palsy	132	10.8	441	36.2	645	53.0
• Brain tumors	115	9.4	461	37.8	642	52.7
• Autism	248	20.4	390	32.0	580	47.6
• Blood diseases	146	12.0	443	36.4	629	51.6

Figure 1: Grades of participants' knowledge regarding impact of advanced father's age on his offspring's health

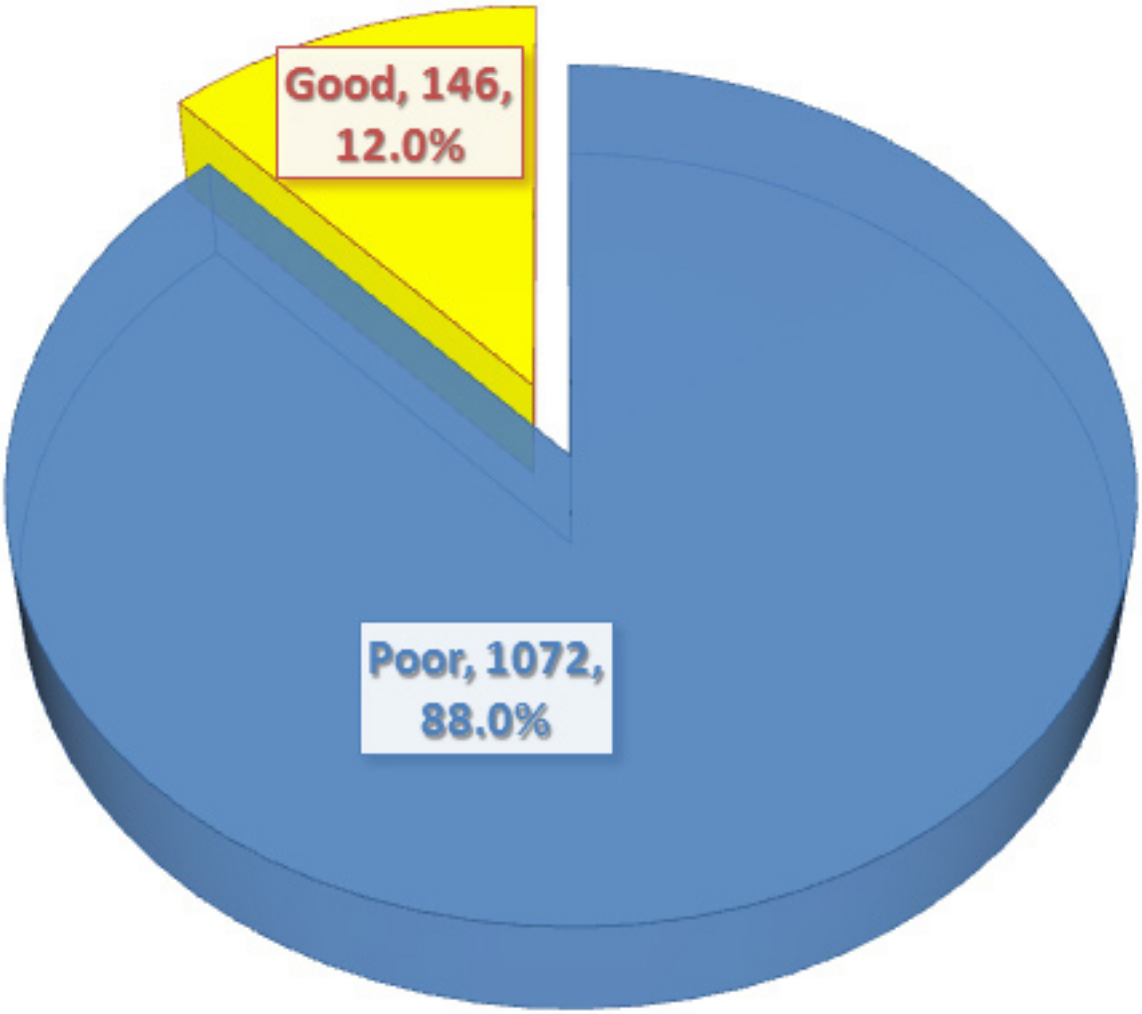

Table 4: Participants' knowledge regarding impact of advanced father's age on his offspring's health

Personal characteristics	Poor (n=1072)		Good (n=146)		P-value
	No.	%	No.	%	
Gender					
• Male	534	88.7	68	11.3	
• Female	538	87.3	78	12.7	0.463
Age group					
• <20 years	206	82.4	44	17.6	
• 20-40 years	654	89.0	81	11.0	
• > 40 years	212	91.0	21	9.0	0.007§
Educational status					
• Primary/Intermediate	33	89.2	4	10.8	
• Secondary	329	86.4	52	13.6	
• University	610	89.6	71	10.4	
• Postgraduate	100	84.0	19	16.0	0.221
Place of employment					
• Unemployed	461	87.3	67	12.7	
• The health sector	224	82.7	47	17.3	
• Not health sector	387	92.4	32	7.6	0.001§
Monthly income					
• <3000 SR	311	89.6	36	10.4	
• 3000-10000 SR	338	87.6	48	12.4	
• >10000 SR	423	87.2	62	12.8	0.543
Nationality					
• Saudi	1006	88.2	135	11.8	
• Non-Saudi	66	85.7	11	14.3	0.521
Current marital status					
• Married	573	89.3	69	10.7	
• Single	499	86.6	77	13.4	0.160

§ Statistically significant

Discussion

There is a consistent increase in average paternal age across all races, ethnicities, and regions, and regardless of level of education in several countries (11-12). Similarly, there are changes in Saudi Arabian families due to rising age at marriage and cultural or economic pressures (13). In the current era, when childbearing is often being delayed, there has been great focus on the effects of advanced maternal age on pregnancy and beyond, while the discussion of advanced paternal age has taken a backseat (14).

Our study revealed that the majority of participants had poor knowledge regarding the impact of fathers' age at conception on their offspring's health. Almost three-quarters of participants considered that age at marriage is increasing in the community, while only 19% of participants stated that it is above 40 years and more than half of participants were aware that aged mothers have more impact on baby's health. Most participants felt the need for raising the public's awareness about baby's health problems associated with father's ageing at conception.

Ford et al. (15) noted that natural fertility rates decline with men older than 40 years compared with men younger than 30 years. After controlling for maternal age, Hassan et al. (16) reported that 76.8% of men younger than 25 years impregnated their female partners within 6 months compared with 52.9% of men older than 45 years. Moreover, advanced paternal age has been linked to increased rates of miscarriage. After controlling for maternal age, partners of men older than 35 years were more likely to miscarry than partners of men younger than 35 years (17-18).

Brandt et al. (19) stated that DNA fragmentation is independently associated with infertility and lower livebirth rates. Therefore, it has been suggested that DNA fragmentation should be part of the routine evaluation of sperm quality for couples undergoing assisted reproductive technologies with advanced age husbands (20).

It is to be noted that most professional societies, including the American College of Obstetrics and Gynecology, the National Society of Genetic Counselors, and the International Society of Prenatal Diagnosis, have not published formal practice guidelines on advanced parental age (19). Ramasamy et al. (21) argued that advanced maternal age is considered at the age of 35 years, and the likelihood of pregnancy declines after intercourse with men aged >34 years (22). However, the American College of Medical Genetics has defined advanced parental age as 40 years or older at the time of conception (19).

About one-third of participants in our study indicated that advanced paternal age may negatively affect baby's health, with higher incidence of congenital heart diseases (19.2%), harelip (12.2%), Down syndrome (25.2%), congenital head deformities (14.9%), epilepsy (13.7%), cerebral palsy (10.8%), brain tumors (9.4%), blood diseases (12%), or autism (20.4%).

Several studies confirmed that advanced paternal age at conception constitutes a significant risk factor for high morbidity outcome among offspring. Archer et al. (5) reported high incidence rates for congenital malformations among offspring of fathers with advanced paternal age, e.g., anencephaly, spina bifida, encephalocele, ventricular septal defect, atrial septal defects, harelip, cleft palate, and Down syndrome.

Malaspina et al. (23) reported that, in a subgroup of men 40-49 years old, the relative risk of developing autism spectrum disorders was six-fold more likely in their children than the offspring of men younger than 20 years of age. Toriello and Meck (24) found that, either alone or in combination with a maternal age effect, advanced paternal age may increase the risk of Down syndrome. Khandwala et al. (12) added that advanced paternal age was associated with an increased risk of premature birth, low birth weight, and low Apgar score.

Moreover, advanced paternal age was reported to be a risk factor for several birth defects. Odds ratios (OR) more than 1 were reported with each year of increase in paternal age for cleft lip (OR: 1.02), diaphragmatic hernia (OR: 1.04), right ventricular outflow tract obstruction, (OR: 1.03), and pulmonary stenosis (OR: 1.02) with each year of increase in paternal age (25). Although these odds suggest a small magnitude of, the cumulative risk over decades is substantial. A 40-year-old father would have twice the odds of having a child with diaphragmatic hernia compared with a 20-year-old father given the adjusted OR of 1.04. The relative risk for offspring with schizophrenia was 2 for fathers aged 45-49 years and 3 for fathers aged >50 years Malaspina et al. (26).

Johnson et al. (27) explained the high morbidity rates among offspring of fathers with advanced age by that increasing paternal age negatively affects sperm quality, with decline in semen volume, total sperm count and motility, percentage of morphologically normal sperm, and increased DNA fragmentation rates. These age-dependent changes in semen quality could be attributed to normal physiological changes in the reproductive tract that occur with ageing, decreased capacity for cellular and tissue repair of damage induced by exposure to toxicants or diseases, and increased chances with age of having reproductive damage resulting from exogenous exposures such as smoking or infections (28). However, the fact that both normal physiological processes and environmental factors could be held responsible for the effects of ageing on the male reproductive system adds to its complexity (29).

The present study revealed that public's poor knowledge regarding the possible impact of advanced paternal age on offspring's health is quite general, as participants' knowledge did not differ significantly according to their gender, educational status, monthly income, nationality or marital status. However, participants' knowledge grades differed significantly according to their age and employment status, with those aged above 40 years and

those with other than health sectors employment having the least proportion of good knowledge, while younger participants (aged less than 20 years) and those employed in the health sector, despite having high percentages of poor knowledge, had relatively the highest percentages of good knowledge.

Although it is alarming that the majority of participants had poor knowledge about the negative impact of advanced paternal age on offspring, it is not surprising that those employed in the health sector had relatively less percentage of poor knowledge. Moreover, higher percentage of poor knowledge among older participants may be attributed to the fact that internet sources of knowledge are more frequently used by younger people. However, the present study indicates that it is a pressing necessity to raise the awareness of the public in Saudi Arabia regarding the fact that not only mothers, but also fathers at a given point in time, mostly after the age of 40 years, experience decreased fertility, and constitute a high risk for congenital malformations among their offspring.

Demographic studies have revealed that the number of births to parents older than 35 years has more than doubled in the past 20 years in the USA. This increase in parental age is a public health concern since more infants are being born with increasing risk for genetic abnormalities (30).

Societal pressures are partly to blame for delaying childbearing and the rising age of parents at conception. Careers and educational aspirations, along with an increased life expectancy and the nearly ubiquitous use of contraception, have decreased accidental birth rates and increased parental age at first childbirth. Moreover, the success of in vitro fertilization has given many couples a type of 'reproductive security blanket' by assuring them that if the traditional methods of achieving conception are not successful, technology will come to their rescue (31). Additionally, increased rates of divorce and remarriage, resulting in many fathers having a child with a second spouse or partner later in life, has contributed to increasing paternal age. Improved methodologies for assisted reproductive technologies have paralleled these lifestyle and cultural changes, allowing for couples to start families later in life despite declining fertility (32).

Brandt et al. (19) advocated that raising the awareness of couples regarding the risk of advanced paternal age on their offspring should be performed by offering preconception genetic counseling. Given that maternal and paternal ages are highly correlated, many couples may already be presenting for genetic counseling to discuss maternal risks and their pregnancies. Moreover, Durairajanayagam (33) stressed that couples must be counselled with equal emphasis on the contribution of both advanced paternal and maternal ages as being potential risk factors of negative pregnancy outcomes and impaired offspring health. In that respect, the public's awareness and recognition of the possible impact of risk factors present in daily life is crucial amongst couples seeking conception.

In conclusion, the public in Saudi Arabia mostly have poor knowledge about impact of advanced paternal age on offspring's health. Their poor knowledge is less among younger people and those who work in the health sector. Most of them feel the need to raise their awareness about offspring's health problems associated with father's ageing. Therefore, it is recommended to raise the awareness of the public in Saudi Arabia regarding the fact fathers, mostly after the age of 40 years, experience decreased fertility, and constitute a high risk for congenital malformations among their offspring. Moreover, couples must be counselled on the impact of advanced paternal and maternal ages on negative pregnancy outcomes and impaired offspring health.

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Awareness Level of Mothers Regarding Child Weaning Practice in Aseer Region, Southern of Saudi Arabia

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Abstract

Background: Weaning is the process of gradually introducing an infant diet while withdrawing the supply of its mother's milk. The infant is fully weaned once it is no longer fed any breast milk. Preferred time and method to wean a human infant is controversial. The American Academy of Paediatrics recommends feeding a baby only breast milk for the first six months of its life. Recently, breastfeeding has become challenging as many mothers must return to work relatively soon after the birth of their child.

Aim: To assess mother's awareness regarding weaning practices and its determinants among Mothers in Aseer reign, southern Saudi Arabia.
Methodology: A descriptive cross-sectional survey was used targeting all mothers in Aseer region. The study was conducted during the period from February 2020 to May 2020. Data were collected using structured questionnaire which was developed by the researchers after intensive literature review and expert's consultation. The questionnaire was uploaded online using social media platforms by the researchers and their relatives and friends to be filled in by all population in Aseer region.

Results: The survey included 803 responding mothers whose ages ranged from 20 to 55 years with mean age of 30.6 ± 10.2 years old. University level of education was recorded for 516 mothers (64.3%). Exactly 174 mothers (18.3%) reported that infant food should be breast milk only till the age of 4 months. Regarding importance of breast feeding, 686 (85.4%) of the mothers reported provision of nutrients needed in 1st 6 months and 63.1% reported for reducing infectious diseases risk while only 9 (1.1%) reported that it improves child immunity. In total, good awareness level regarding weaning practice was reported among less than 10% of the surveyed mothers.

Conclusions & recommendations: In conclusion, the study revealed that mothers in Aseer region had poor knowledge regarding weaning and weaning practice especially effects of delayed weaning. Their main source of information was based on their personal experience. More effort should be paid to improve mother's awareness and practice regarding breast feeding and weaning.

Key words: Weaning practice, breast feeding, mothers, awareness, practice, supplementary feeding.

Background

Breastfeeding is the feeding of infants and young children with milk from a mother's breast (1). It is recommended that breastfeeding should begin within the first hour of a baby's life and continue as often and as much as the baby wants (2, 3). Deaths of 820,000 children under the age of five could be prevented globally every year with increased breastfeeding (4). Breastfeeding decreases the risk of respiratory tract infections and diarrhea, both in developing and developed countries (5, 6).

Weaning is the process of gradually introducing an infant diet while withdrawing the supply of its mother's milk. The infant is fully weaned once it is no longer fed any breast milk (7). Preferred time and method to wean a human infant is controversial. The American Academy of Paediatrics recommends feeding a baby only breast milk for the first six months of its life (8). Recently, breastfeeding has become challenging as many mothers must return to work relatively soon after the birth of their child. Although, foods are given to children between 4 and 6 months old with the precaution that the food is available to be consumed besides breast milk or formula and is just for "practice". These practice foods are generally soft and runny. Examples include mashed fruit and vegetables (9, 10). The United Kingdom's NHS recommends avoiding foods including those "that contain wheat, gluten, nuts, peanuts, peanut products, seeds, liver, eggs, fish, shellfish, cows' milk and soft or unpasteurised cheese" till the age of six months, due to fear of food allergies or may make the baby ill (11). Delayed weaning may result in protein energy malnutrition which causes severe neurological manifestations (12).

Factors affecting weaning are different and related to socioeconomic status of the mothers, mother's education, culture, norms and beliefs and taboos (13-15). Comprehensive nursing was infrequent. In Kuwait, they use artificial feeding immediately after birth. The breast-feeding rate was 26% while bottle feeding rate was 42%. Between 3 months to 5 months of ages, fruit juices, cereal products like biscuits and cerelac are given to the child (16). In Saudi Arabia, the breastfeeding initiation rate exceeded 95%. Only 8.3% of mothers never breastfeed their children. Early initiation of breastfeeding within the first hour of birth was recorded for 40% of the mothers (17). As for weaning practice in Saudi Arabia, a study in 2016 revealed that 62.5% of the infants received solid foods before reaching 17 weeks old. Younger age, lower education, employment within 6 months post-birth, caesareans and living in low-income households were the most significant predictors of early weaning. Complementary feeding prior to 6 months postpartum was common in Saudi Arabia (18). The current study aimed to assess mother's awareness regarding weaning practices and its determinants among mothers in Aseer reign, southern Saudi Arabia.

Methodology

A descriptive cross-sectional survey was used targeting all mothers in Aseer region. The study was conducted during the period from February 2020 to May 2020. Mothers with at least one breast fed initiated child were included. Data were collected using structured questionnaire which was developed by the researchers after intensive literature review and expert's consultation. The questionnaire data included mother's socio-demographic data such as age and education. The questionnaire included data regarding number of children, age of youngest child, and if mothers provided supplementary feeding for their children. Mother's awareness regarding child weaning practice was assessed, covering duration of breast feeding, age of weaning, supplementary feeding, and effects of early, sudden and delayed weaning. A panel of 5 experts reviewed the questionnaire independently for content validity and all suggested changes were considered untill the final tool was created. The questionnaire was uploaded online using social media platforms by the researchers and their relatives and friends, to be filled out by all population in Aseer region. A pilot study was conducted to assess tool applicability and reliability. The tool reliability coefficient (Alpha Cronbach's) was assessed and equalled 0.83.

Data analysis

After data were extracted, it was revised, coded and fed into statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A participant with a score less than 60% (20 points) of the maximum score was considered to have poor awareness while good awareness was considered if she had a score of 60% (21 points or more) of the maximum or more. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, awareness items and source of information. Crosstabluation was used to assess distribution of awareness according to the mother's personal data and source of information. Relations were tested using Pearson chi-square test.

Results

The survey included 803 responding mothers whose ages ranged from 20 to 55 years with mean age of 30.6 ± 10.2 years old. Exactly 765 (95.3%) of the mothers were married. University level of education was recorded for 516 mothers (64.3%) and 57.5% had monthly income of 10,000 SR or more. Regarding number of children, 480 (59.8%) had 1-3 children and 4% of the mothers had 4 children or more. Exactly 161 mothers (20%) had children at age of less than one year and these children were males among 426 (53.1%) of the families. Regarding giving children supplementary feeding with weaning, it was reported by 636 (79.2%) of the mothers (Table 1).

Table 2 illustrates mothers' awareness regarding weaning practice. Exactly 174 mothers (18.3%) reported that infant food should be breast milk only until the age of 4 months. Regarding importance of breast feeding, 686 (85.4%) of the mothers reported provision of nutrients is needed in the first 6 months and 63.1% reported for reducing infectious diseases risk while only 9 (1.1%) reported that it improves the child's immunity. Considering time to introduce supplementary food for the child, 338 mothers (42.1%) said at the age of 4-6 months. The average daily meals during weaning of 2-4 meals was reported by 495 mothers (61.6%). As for Pattern of the daily feeding rate at the beginning of weaning, 706 mothers (87.9%) reported that breast feeding during weaning should stop gradually. As for kind of food introduced during breast feeding, 653 (81.3%) of the mothers reported crushed and easy to chew food, 496 (61.8%) reported crushed vegetables and fruits while fluids were reported by 57.3% of the mothers. Age of 1 year as the suitable age for the child to eat family food without contraindications was mentioned by 388 (48.3%) of the mothers. Also, 1 year was the age at which the infant can completely dispense with breast milk was reported by 89 mothers (11.1%). Regarding effect of early weaning, 708 mothers (88.2%) reported deprivation of child from breast feeding nutrients and 406 (50.6%) said malnutrition. Considering effects of sudden weaning, 689 (85.8%) mothers reported psychological disturbance (crying) and 65.3% reported refusing alternative food. Connection of the child with mother was the most reported effect of delayed weaning (75%; 602) followed by tooth disorders (53.2%; 427). In total, good awareness level regarding weaning practice was reported among 92 mothers (11.5%).

As for source of information (Figure 1), personal experience was the most reported source (52.4%) followed by internet (17.1%), family and friends (16.7%), and physician (13.8%).

Regarding distribution of mothers' awareness regarding weaning practice according to their personal data (Table 3), only mother's level of education was the significant predictor as good awareness level was recorded among 25.5% of university students compared to 6.1% of mothers with secondary level of education or less (P=.003).

Table 1. Personal data of surveyed mothers in Aseer region, Saudi Arabia

Personal data		No	%
Age in years	20-29	222	27.7%
	30-39	361	45.0%
	40-49	181	22.5%
	50+	39	4.9%
Marital status	Married	765	95.3%
	Divorced/ widow	38	4.7%
Educational level	Secondary or below	147	18.3%
	Diploma	89	11.1%
	University student	51	6.4%
	University/ more	516	64.3%
Monthly income	< 5000 SR	66	8.2%
	5000-10000 SR	275	34.2%
	10000-15000 SR	242	30.1%
	15000-20000 SR	136	16.9%
	> 20000 SR	84	10.5%
Number of children	1-3	480	59.8%
	4-6	291	36.2%
	7+	32	4.0%
Age of youngest child	< 1 year	161	20.0%
	1-5	369	46.0%
	5-10	177	22.0%
	10-15	96	12.0%
Child gender	Male	426	53.1%
	Female	377	46.9%
Did you give your child supplementary feeding	Yes	636	79.2%
	No	167	20.8%

Table 2. Mothers' awareness regarding weaning in Aseer region, Saudi Arabia

Awareness regarding weaning		No	%
At what age should infant food be breast milk only?	*At age of 3 months*	*68*	*8.5%*
	At age of 4 months	*147*	*18.3%*
	At age of 6 months	*357*	*44.5%*
	At age of 9 months	*35*	*4.4%*
	At age of 1 year	*196*	*24.4%*
The importance of breastfeeding the infant	*Provision of nutrients needed at 1st 6 months*	*686*	*85.4%*
	Reduce infectious diseases risk	*507*	*63.1%*
	Normal weight gain of the child	*333*	*41.5%*
	Reduce risk of breast and ovarian cancers of mothers	*499*	*62.1%*
	Reduce risk of osteoporosis	*295*	*36.7%*
	Improve child immunity	*9*	*1.1%*
	Others	*3*	*.4%*
The time to introduce meals (supplementary foods) other than breast milk for a child's diet	*Before age of 3 months*	*9*	*1.1%*
	4-6 months	*338*	*42.1%*
	9-12 months	*443*	*55.2%*
	After age of 12 months	*13*	*1.6%*
The average daily meals for a child other than breast milk during weaning	*Once daily*	*47*	*5.9%*
	2-4 times daily	*495*	*61.6%*
	5-9 times daily	*244*	*30.4%*
	> 9 times daily	*17*	*2.1%*
Pattern of the daily feeding rate at the beginning of weaning?	*BF stop gradually*	*706*	*87.9%*
	BF stop directly	*26*	*3.2%*
	Daily BF frequency should not be reduced with weaning	*71*	*8.8%*
Kind of food a child can eat at the beginning of weaning?	*Don't know*	*30*	*3.7%*
	Fluids	*460*	*57.3%*
	Crushed and easy to chew food	*653*	*81.3%*
	Crushed vegetables and fruits	*496*	*61.8%*
	Crushed rice	*363*	*45.2%*
	Solid food	*55*	*6.8%*
	Grapes	*113*	*14.1%*
	Egg	*273*	*34.0%*
	Meat	*89*	*11.1%*
	Spicy food	*9*	*1.1%*
	Nuts	*18*	*2.2%*

(Table 2 continued) Mothers' awareness regarding weaning in Aseer region, Saudi Arabia

Awareness regarding weaning, continued		No	%
The age at which an infant can eat family food without contraindications	*At age of 1 year*	*388*	*48.3%*
	At age of 2 years	*201*	*25.0%*
	At age of 9 months	*50*	*6.2%*
	9-12 months	*164*	*20.4%*
At what age can the infant completely dispense with breast milk?	*Till age of 6 months*	*7*	*.9%*
	Till age of 9 months	*21*	*2.6%*
	Till age of 1 year	*89*	*11.1%*
	Till age of 2 years	*686*	*85.4%*
The effects caused by the early weaning of the child	*Nothing*	*42*	*5.2%*
	Deprivation of child from breast feeding nutrients	*708*	*88.2%*
	Increase the risk of infectious diseases	*310*	*38.6%*
	GIT disturbance	*259*	*32.3%*
	Malnutrition	*406*	*50.6%*
	Food allergy	*109*	*13.6%*
	Psychological disturbance	*19*	*2.4%*
The effects caused by sudden child weaning	*Nothing*	*19*	*2.4%*
	Refusing alternative food	*524*	*65.3%*
	Psychological disturbance (crying)	*689*	*85.8%*
	Breast pain	*454*	*56.5%*
	Breast inflammation	*196*	*24.4%*
	Recurrent infectious diseases	*147*	*18.3%*
	for the mother	*195*	*24.3%*
The effects caused by delayed child weaning	*Nothing*	*66*	*8.2%*
	Connection with mother	*602*	*75.0%*
	Long term personality effect	*231*	*28.8%*
	Poor communication skills	*168*	*20.9%*
	Tooth disorders	*427*	*53.2%*
	Iron deficiency anaemia	*92*	*11.5%*
	DM	*12*	*1.5%*
Overall awareness level	*Poor*	*711*	*88.5%*
	Good	*92*	*11.5%*

Figure 1. Source of information regarding weaning as reported by mothers

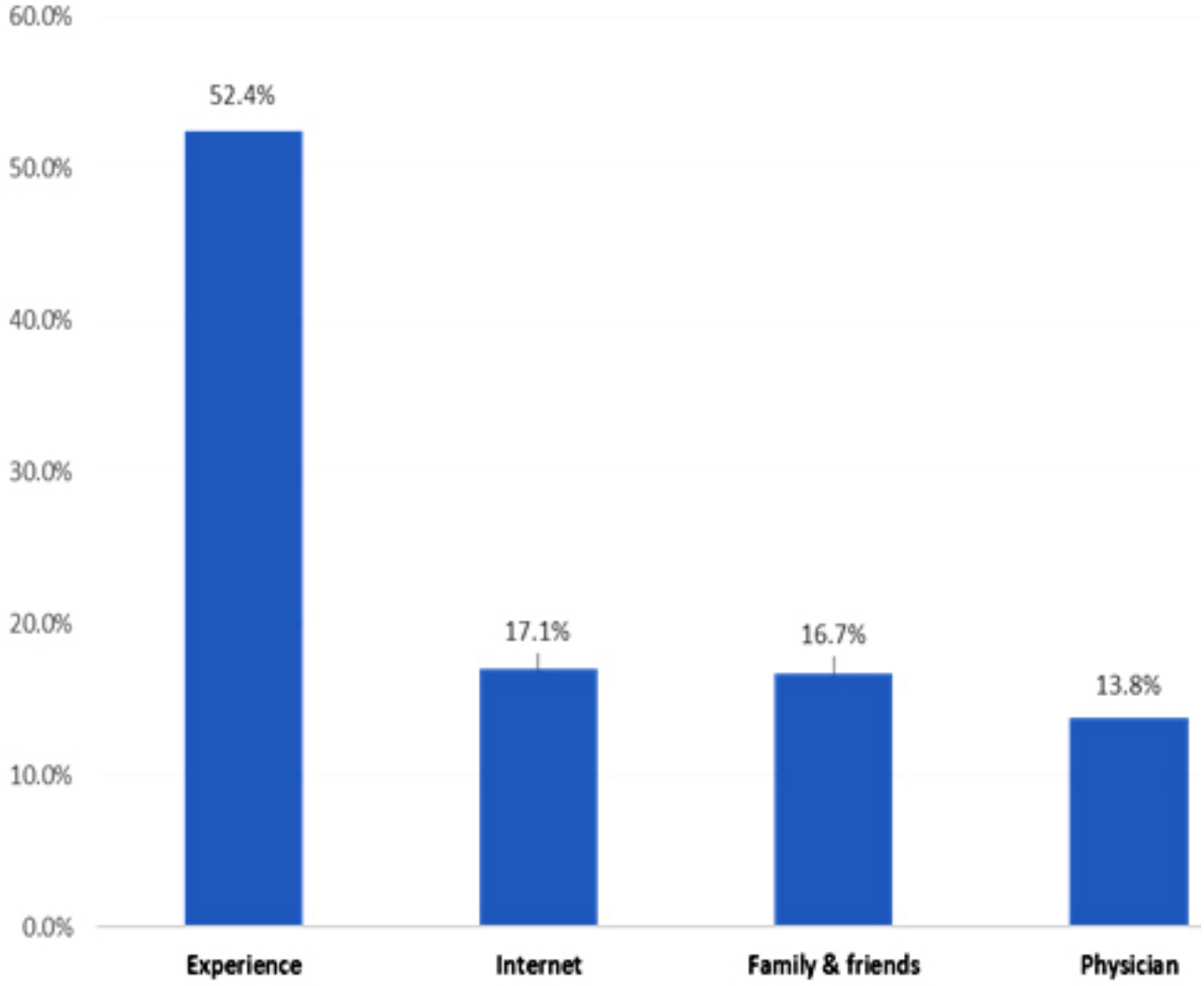

Table 3. Distribution of mothers' awareness regarding weaning practice according to their personal data

Factors		Awareness level				P-value
		Poor		Good		
		No	%	No	%	
Age in years	20-29	193	86.9%	29	13.1%	.361
	30-39	324	89.8%	37	10.2%	
	40-49	157	86.7%	24	13.3%	
	50+	37	94.9%	2	5.1%	
Marital status	Married	676	88.4%	89	11.6%	.480
	Divorced/ widow	35	92.1%	3	7.9%	
Educational level	Secondary or below	138	93.9%	9	6.1%	.003*
	Diploma	80	89.9%	9	10.1%	
	University student	38	74.5%	13	25.5%	
	University/ more	455	88.2%	61	11.8%	
Monthly income	< 5000 SR	62	93.9%	4	6.1%	.138
	5000-10000 SR	243	88.4%	32	11.6%	
	10000-15000 SR	206	85.1%	36	14.9%	
	15000-20000 SR	126	92.6%	10	7.4%	
	> 20000 SR	74	88.1%	10	11.9%	
Number of children	1-3	425	88.5%	55	11.5%	.622
	4-6	256	88.0%	35	12.0%	
	7+	30	93.8%	2	6.3%	
Age of youngest child	< 1 year	151	93.8%	10	6.2%	.105
	1-5	325	88.1%	44	11.9%	
	5-10	153	86.4%	24	13.6%	
	10-15	82	85.4%	14	14.6%	
Child gender	Male	374	87.8%	52	12.2%	.478
	Female	337	89.4%	40	10.6%	
Source of information	Family & friends	114	85.1%	20	14.9%	.128
	Internet	121	88.3%	16	11.7%	
	Physician	105	94.6%	6	5.4%	
	Experience	371	88.1%	50	11.9%	
Did you give your child supplementary feeding	Yes	567	89.2%	69	10.8%	.291
	No	144	86.2%	23	13.8%	

P: Pearson X2 test
* P < 0.05 (significant

Discussion

Breastmilk provides all the energy and nutrients that the infant needs for the first months after birth, and it provides up to half or more of a child's nutritional needs during the second half of the 1st year, and up to one third during the second year of life (19). Human milk alone, even in reasonable quantities, cannot provide all the energy and protein required for maintaining an adequate velocity of growth for the infant, after the age of six months. Adequate nutrition is essential to maintain optimum health of baby at the age of 6 months (20). Malnutrition and micronutrient deficiencies are a very common effect of delayed weaning and improper weaning practices. There are many factors affecting weaning practices. Initiating complementary feeds too late or too early can lead to malnutrition (21).

The current study aimed to assess mother's awareness regarding weaning practice in Aseer region, Southern Saudi Arabia. The study revealed that only nearly one out of each 10 mothers had good awareness level regarding weaning practice. Not all mothers were knowledgeable regarding the optimum age of having complementary food and when exactly the child can completely dispense with breast feeding. Also, irrespective of that, most mothers know about the importance of breast feeding, but they showed vary poor awareness regarding its significant role in improving their children's immunity. Also, not all mothers were knowledgeable regarding which type of food the child could have at the beginning of weaning, especially fruits and vegetables. As most mothers reported good awareness regarding the effect of early and sudden weaning but most of them had lack of knowledge regarding delayed weaning other than it can cause teeth disorders. Effect of delayed weaning on personality, malnutrition, and poor communication were not reported by most mothers. The only significant determinant of mothers' awareness regarding weaning practice was their level of education. Mothers with higher education level were more knowledgeable than others. There was an interesting finding that the most recorded source of mothers information regarding weaning was their own experience which means that there is defect from the medical staff side during antenatal care as they should be the main source of information for breast feeding and weaning. Another finding was that nearly one out of each five mothers did not give her child supplementary feeding which mostly meant delayed weaning.

A study was conducted by Pant I et al in India to assess mother's knowledge regarding weaning practice (22). The study result shows that about 42% of the mothers of infants had poor knowledge about the weaning process. 38% of the samples had average knowledge regarding weaning process and 20% of the mothers are aware and had good knowledge regarding weaning process. A second study was conducted by Karnawat D et al (23), and revealed that rural mothers had poor knowledge regarding choice of milk for infants, and duration of exclusive and total breastfeeding. Only 20% of rural mothers knew about correct age of weaning. Knowledge and practice scores of mothers from urban areas were better than that of rural ones. The average knowledge score of urban mothers in breast feeding and weaning was 61.6% and 64.0% respectively as compared to 45% and 44% respectively of rural mothers. Conversely , mothers included in a study conducted by Mohammed ES in Egypt had good knowledge regarding the significance of breastfeeding for children (24). As regards weaning, the majority (92.5%) of the mothers defined weaning correctly. The majority of the mothers (94.8%) reported that breastfeeding protects the child from infection, 96.1% agreed that it is the healthiest for the infant, 76.5% agreed that breast milk lead to loss of figure and 83.4% agreed that breastfeeding should be avoided during mother's illness.

Conclusion and Recommendations

In conclusion, the study revealed that mothers in Aseer region had poor knowledge regarding weaning and weaning practice. Their main source of information was based on their personal experience. Physician role in providing health education regarding breast feeding and weaning practice was defective. More effort should be paid to improve mother's awareness and practice regarding breast feeding and weaning. This needs national and family-based interventions. Health education sessions can be held during child vaccination sessions besides what should be during antenatal care visits. Social media is an effective method to provide educational material to mothers in an easy and interesting way.

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Public Awareness and Knowledge of Pap smear as a Screening Test for Cervical Cancer among Saudi Population in Aseer Region, Saudi Arabia

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Abstract

Background: Cancer of the cervix is ranked the second most common female cancer worldwide (14). Recently, it was reported to be the fourth most common female cancer. However, the disease burden is now mainly in the less developed regions of the world. The worldwide reported significant decline in the magnitude of cancer of the cervix in the world especially in developed countries is attributed mainly to the wide use of the Papanicolaou (Pap) smear as an effective screening tool for cervical cancer caused by human papilloma virus. If test findings were abnormal, then more sensitive diagnostic procedures are required and if warranted, interventions that aim to prevent progression to cervical cancer.

Aim: To assess the level of public awareness, knowledge, and attitudes towards Pap smear as a screening test for cervical cancer among Saudi women, attending major healthcare facilities in the Aseer region.

Methodology: A descriptive cross-sectional survey was conducted targeting all females in Aseer region, southern Saudi Arabia aged 18 years up to 65 years. A direct interview questionnaire was constructed by the researchers. The questionnaire covered females' sociodemographic data including age, marital status, education, and job title. Female awareness regarding Pap smear and females practice regarding Pap smear was also assessed by four items.

Results: The survey included 956 females whose ages ranged from 18 to 65 years old. About 64% of the females were married and 29.9% were single. As for females' awareness regarding Pap smear test, more than 60% of the females had heard about Pap smear and nearly half knew its importance. Exactly 19.1% of the females reported that Pap smear test should start after marriage and 13.8% said that it should be done every three years. Totally, a very small percentage of the females had good awareness regarding Pap smear test.

Conclusions: In conclusion, the study revealed that there is a great lack of knowledge regarding Pap smear as a screening method of cancer of the cervix among Saudi females in Aseer region. The lack of knowledge was more reported among highly educated working females. The test should be done routinely in obstetrics and gynecology departments of the hospitals for high-risk groups.

Key words: Pap smear, Pap test, cervical cancer, screening, cervix screening, awareness, practice, population

Background

The Papanicolaou test (Pap test, Pap smear) which is also named cervical smear, cervical screening or smear test is a method of cervical screening used to detect potentially precancerous and cancerous changes in the cervix or colon [1, 2]. If test findings are abnormal, then more sensitive diagnostic procedures are required and if warranted, interventions that aim to prevent progression to cervical cancer [3]. The test was independently invented in the 1920s by Dr. Georgios Papanikolaou and Dr. Aurel Babeș and named after Papanikolaou. A simplified version of the test was introduced by Anna Marion Hilliard in 1957 [4]. The Pap smear is performed having cells from the vaginal canal at the outer opening of the cervix at the transformation zone (where the outer squamous cervical cells meet the inner glandular endocervical cells). The collected cells are examined under a microscope to look for abnormalities [5]. The test remains an effective, widely used method for early detection of precancerous cervical changes or even cancer of the cervix. The test may also detect infections and abnormalities in the endocervix and endometrium [6].

In the United States, Pap smear screening is advised at the age of 21 years until the age of 65 (7). Guidelines on frequency vary from every three to five years [7-9]. If abnormal findings are detected, and depending on the nature of the abnormality, the test may need to be repeated in six to twelve months [10]. If the abnormality requires closer scrutiny, the patient may be referred for detailed inspection of the cervix by colposcopy. The person may also be referred for HPV DNA testing, which can serve as an adjunct to Pap testing. Additional biomarkers that may be applied as ancillary tests with the Pap test are evolving [11]

Continuous screening and females' awareness programs in the developed countries were the main factors behind the success of Pap smear testing in these countries. Extensive screening programs and the awareness regarding the test's importance in preventing cervical cancer was the main motive behind these assessments and intervention programs [12, 13]. The current study aimed to assess the females' awareness regarding Pap smear test and its importance in Aseer region, southern Saudi Arabia.

Methodology

A descriptive cross-sectional survey was conducted targeting all females in Aseer region, southern Saudi Arabia aged 18 years up to 65 years. A direct interview questionnaire was constructed by the researchers after intensive literature review. After constructing the questionnaire, five experts in the field of the questionnaire topic reviewed the items independently to assess their content validity and applicability. All modifications were applied till reaching the final form. A pilot study was conducted to assess the tool clarity and reliability including 15 females who were excluded from the final study. The tool was completed within 20 minutes per case and had reliability coefficient (alpha Cronbach's) of 0.76. The questionnaire covered females' sociodemographic data including age, marital status, education and job title. Female awareness regarding Pap smear was assessed using 10 questions covering its importance, proper age to have and to stop having the test, and frequency of doing the test. Females' practice regarding Pap smear was also assessed by four items.

Data analysis

After data were extracted, it was revised, coded and fed into statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A female with score less than 60% (5 points) of the maximum score was considered to have poor awareness while good awareness was considered if she had a score of 60% (6 points or more) of the maximum. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, awareness items and females' practice. Univariant relations between females demographic and practice data with awareness level were done based on Pearson chi-square test.

Results

The survey included 956 females whose ages ranged from 18 to 65 years old. About 64% of the females were married and 29.9% were single. University education was recorded for 77.7% of the females and 47% were working females while 25.6% were housewives (Table 1).

Considering females' awareness regarding Pap smear test, Table 2 demonstrates that 67.3% of the females had heard about Pap smear and 48.3% know its importance. Exactly 19.1% of the females reported that Pap smear test should start after marriage and 13.8% said that it should be done every three years. Only 10.8% of the females knew that Pap smear is not recommended after the age of 60 years and 15.7% knew the difference between Pap smear test and upper cervical smear. Totally, 13% of the females had good awareness regarding Pap smear test.
With regard to the source of females' awareness (Graph 1), obstetric and gynecology clinic was the most reported source (47.7%) followed by social media (20.4%), friends and family (16.2%) while health care providers was reported by 10% of the females.

As for Pap smear practice (Table 3), 22.8% of the females previously had undergone Pap smear and 23.2% were advised by their doctors to do it. Also 88.7% of the participant females never asked their physician to do a Pap smear test.

On relating female's awareness with their characteristics, Table 4 demonstrates that 25.6% of females with a basic level of education had good awareness level compared to 11.4% of those with university level with recorded statistical significance (P=.010). Also 16.7% of housewives

had good awareness level compared to 10.2% of working females (P=.042).

Good awareness level was recorded among 23.9% of females with previous history of doing Pap smear compared to 9.8% of others who didn't (P=.001). Exactly 21.6% of the females who were advised to undergo Pap smear by their physicians had good awareness level compared to 10.4% of those who didn't (P=.001). Also 14% of the females who think that they need to know more about Pap smear had good awareness compared to none of the others (P=.001).

Table 1. Personal data of Saudi female respondents in Aseer region, Saudi Arabia

Personal data	No	%
Age in years		
< 20 years	49	5.1%
20-29	279	29.2%
30-39	242	25.3%
40-49	331	34.6%
50+	55	5.8%
Marital status		
Single	286	29.9%
Married	613	64.1%
Divorced/ widow	57	6.0%
Educational level		
Illiterate	3	.3%
Basic	54	5.6%
Secondary	156	16.3%
University	743	77.7%
Job		
Housewife	245	25.6%
Student	262	27.4%
Working	449	47.0%

Table 2. Females' awareness regarding Pap smear in Aseer region, Saudi Arabia

Knowledge items		No	%
Know about Pap smear	No	313	32.7%
	Yes	643	67.3%
Know importance of Pap smear.	No	494	51.7%
	Yes	462	48.3%
Know the time for Pap smear.	No	616	64.4%
	Yes	340	35.6%
Proper time for Pap smear	Don't know	375	39.2%
	After marriage	183	19.1%
	After age of 30	148	15.5%
	After age of 40	250	26.2%
Know frequency for Pap smear.	No	731	76.5%
	Yes	225	23.5%
Frequency of doing Pap smear.	Don't know	490	51.3%
	Every 3 years	132	13.8%
	Every year	166	17.4%
	Every 6 months	168	17.6%
Know when to stop Pap smear.	No	520	54.4%
	Yes	436	45.6%
Time to stop Pap smear.	Don't know	520	54.4%
	After age of 60	103	10.8%
	After age of 50	227	23.7%
	After age of 70	106	11.1%
Know the difference between Pap and upper cervical smear.	No	806	84.3%
	Yes	150	15.7%
Interested to know more regarding Pap smear.	No	69	7.2%
	Yes	887	92.8%
Knowledge level	Poor	832	87.0%
	Good	124	13.0%

Figure 1. Source of information regarding Pap smear among respondent females

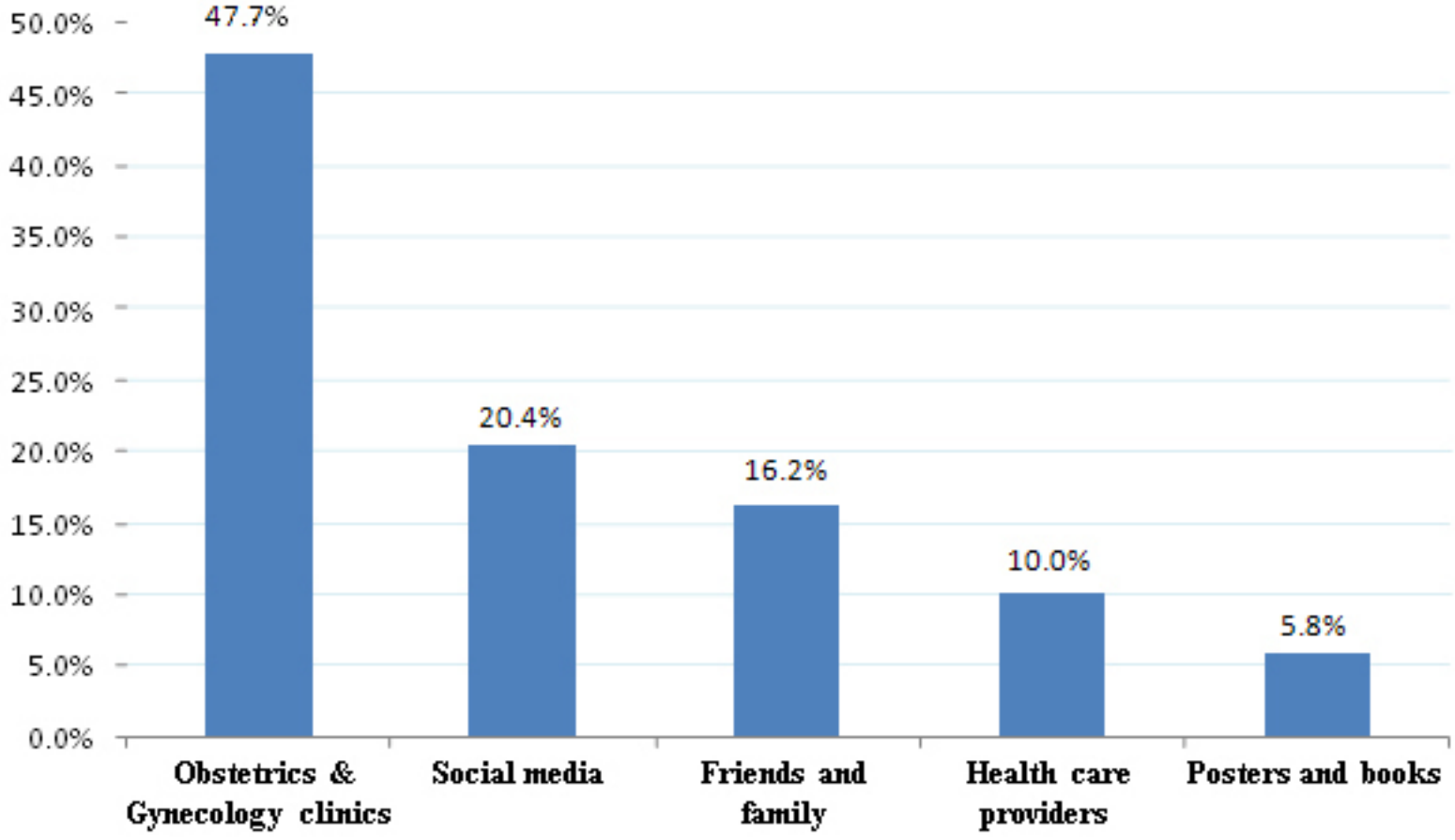

Table 3. Practice regarding Pap smear among females in Aseer region, Saudi Arabia

Practice	No	%
Previously did Pap smear		
No	*738*	*77.2%*
Yes	*218*	*22.8%*
Advised by physician for Pap smear		
No	*734*	*76.8%*
Yes	*222*	*23.2%*
Advised relatives/ friends to do Pap smear		
Never	*766*	*80.1%*
Sometimes	*161*	*16.8%*
Usually	*29*	*3.0%*
Asked your physician for Pap smear		
Never	*848*	*88.7%*
Sometimes	*82*	*8.6%*
Usually	*26*	*2.7%*

Table 4. Distribution of awareness regarding Pap smear according to females' personal data and practice

Factors		Knowledge level				P-value
		Poor		Good		
		No	%	No	%	
Age in years	< 20 years	43	87.8%	6	12.2%	.454
	20-29	242	86.7%	37	13.3%	
	30-39	203	83.9%	39	16.1%	
	40-49	295	89.1%	36	10.9%	
	50+	49	89.1%	6	10.9%	
Marital status	Single	242	84.6%	44	15.4%	.232
	Married	542	88.4%	71	11.6%	
	Divorced/widow	48	84.2%	9	15.8%	
Educational level	Illiterate	3	100.0%	0	0.0%	.010*
	Basic	40	74.1%	14	25.9%	
	Secondary	131	84.0%	25	16.0%	
	University	658	88.6%	85	11.4%	
Job	Housewife	204	83.3%	41	16.7%	.042*
	Student	225	85.9%	37	14.1%	
	Working	403	89.8%	46	10.2%	
Previously did Pap smear	No	666	90.2%	72	9.8%	.001*
	Yes	166	76.1%	52	23.9%	
Advised by physician for Pap smear	No	658	89.6%	76	10.4%	.001*
	Yes	174	78.4%	48	21.6%	
Interested to know more regarding Pap smear	No	69	100.0%	0	0.0%	.001*
	Yes	763	86.0%	124	14.0%	

P: Pearson X2 test * P < 0.05 (significant)

Discussion

Cancer of the cervix was ranked the second most common female cancer worldwide [14]. Recently, it is reported to be the fourth most common female cancer [15]. However, the disease burden is now mainly in the less developed regions of the world [16]. The worldwide reported significant decline in the magnitude of cancer cervix in the world, especially in developed countries is attributed mainly to the wide use of the Papanicolaou (Pap) smear as an effective screening tool for cervical cancer caused by human papilloma virus (HPV) [17].

Cervical cancer is reported as a main cause of mortality especially in case of late presentation [18]. Improving the population awareness regarding cervical cancer and its risk factors in the general population is a vital action, and the practice of getting a Pap smear done regularly is even a significant predictor, particularly in the population with low socio-economic level with limited formal education [19]. There is a defect of knowledge regarding Pap smear testing amongst females who are in the at-risk group.
In Saudi Arabia, cervical cancer is ranked the ninth most common cancer in Saudi females. Moreover, it comprises approximately 2.6% of all newly diagnosed cancers in Saudi females. Human papilloma virus (HPV) [20]. Despite the well-acknowledged benefits of Pap smear and its availability in various healthcare facilities in Saudi Arabia, an intensive screening program for cervical cancer is not well established. Moreover, no formal nationwide campaigns to vaccinate females have been commenced. As a result, it has been observed that the

number of cases of cervical cancer has been increasing over the past two decades [21]. In Saudi Arabia, there are limited studies that have endeavored to explore the awareness, knowledge, and attitudes of women towards Pap smear.

The current study aimed to assess the females' awareness regarding Pap smear in Aseer region, southern Saudi Arabia and to identify their practice for Pap smear. The study revealed that the general female population in Aseer region had very poor knowledge regarding Pap smear as nearly 1 out of each 13 females were knowledgeable regarding all aspects of Pap smear. The knowledge defect was more recorded for frequency of undergoing Pap smear followed with proper time to have Pap smear and when to stop having it. The most interesting finding that needs more assessment for explanation was that the awareness level was significantly higher among females with lower level of education and not working. But females who previously had Pap smear and those who even were asked to do it by their physicians recorded higher awareness level.
Regarding females' practice, only one fifth of the survey females had undergone Pap smear and nearly all were advised to do it by their physicians. Also, the survey revealed that the majority of the survey respondents never asked their physicians to do Pap smear which may be contributed to the lack of their awareness level regarding the test and its importance.

A cross sectional study was conducted to determine the knowledge and practices regarding Papanicolaou (Pap) smear test among female university students of Karachi, 2018 [22]. The study revealed that out of 491 participants, three-quarters of the participants knew about the Pap smear test. However, only 1.6% had undergone the procedure. About 30% of the females in the study attributed the lack of knowledge as the major reason for not getting a Pap smear while another third blamed the lack of recommendation by health care professionals.

Locally, public Awareness and Knowledge of Pap Smear as a Screening Test for Cervical Cancer among the Saudi Population in Riyadh City was assessed by a descriptive cross-sectional study, 2017 [23]. The researchers reported that exactly 46.2% did not hear about Pap smear previously. Only 53.9% had heard about it, mostly during their hospital visits for obstetric/gynecologic purposes (57.1%). Also 75.2% had not had a single Pap smear previously. About 75% of the females reported that their physicians never advised them to do Pap smear.

The survey covered the defect of Saudi females regarding Pap smear awareness and practice as a screening method for more serious health problems, but participants showed their desire to learn more about the test. Improving the awareness regarding cancer of the cervix and all its screening methods is beneficial in early detection and lowering the disease burden.

Conclusion and Recommendations

In conclusion, the study revealed that there is a great lack of knowledge regarding Pap smear as a screening method of cancer of the cervix among Saudi females in Aseer region. The lack of knowledge was more reported among highly educated working females which is surprising. Most females' information was from their visits to obstetrics and gynecology departments not from primary health care center staff which is another defect that should be repaired. More effort should be paid to improve general population awareness regarding Pap smear test and its importance as a screening method for this disorder with a high burden. Also, the test should be done routinely in obstetrics and gynecology departments of the hospitals for high-risk groups.

Ethical approval
The study was approved from The Ethical Committee of the Scientific Research, King Khalid University by date. 26/02/2020 with approval number of (ECM#2020-161)—(HAPO-06-B-001)

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Mobile Phone Addiction and its Relationship to Sleep Quality among the General Population in Abha City, Saudi Arabia

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Abstract

Background: Smartphones are not just used for phone calls and text messaging, but also provide internet access to multimedia through social networks, videogames and Global Positioning System navigation.

Objectives: To assess extent of mobile phone use, and its possible impact on patterns of sleep quality disturbance among the general population.

Methods: A cross-sectional study was conducted among a sample of the general adult population aged >18 years, recruited from large malls in Abha City, Aseer Region, Saudi Arabia between January to December, 2020. Two data collection tools were employed in this study, i.e., the Smartphone Addiction Scale (SAS) to assess smartphone addiction and the Pittsburgh Sleep Quality Index (PSQI) to measure the quality and patterns of sleep.

Results: The study included 475 participants. Their age ranged between 18 and 60 years with a mean±SD of 28.1±8.4 years. Males represented 51.2% of them. The majority (83.8%) reported using a smartphone mainly in social media (48.8%) and considered themselves smartphone addicts. The overall smartphone addiction scale score ranged between 37 and 161 (out of 165) with a mean±SD of 100.2±21.4. Highest scores were reported among those using smartphone for playing games (p=0.003). There was a significant negative correlation between participants' age and their smartphone addiction scale scores (r= -0.112, p=0.015). Overall, poor sleep quality, based on PSQI was observed among 93.7% of participants. Smartphone addiction scale score was significantly associated with subjective sleep quality (p<0.001), sleep latency (p<0.001), sleep duration (p=0.001), habitual sleep efficiency (p=0.029), daytime sleep dysfunction (p<0.001) and overall sleep quality (p=0.001).

Conclusion: Smartphone addiction is an evident problem among our population, particularly younger people. Smartphone addiction is associated with long sleep latency, shorter sleep duration, lower sleep efficiency, higher daytime sleep dysfunction and overall poor sleep quality.

Key Words: Smartphone, Addiction, Sleep quality, Pittsburgh Sleep Quality Index, Smartphone Addiction Scale

Introduction

Under the extensive technological revolution, mobile phone (MP) usage has rapidly increased[1]. Nowadays, smartphones are not just used for phone-calls and text-messaging, but it goes beyond that. They provide internet access to multimedia through social networks, video games and Global Positioning System (GPS) navigation[2] MPs are now utilized globally as one of the chief information and communication technologies (ICTs)[1].

Despite the benefits, there are many adverse effects of smartphone irrational usage. MP can lead also to dependency problems;[3] characterized by excessive and continuous performing of an activity despite its negative outcomes. This includes mental stress, feeling of being captivated, role conflicts, and obligatory feelings to respond to all notifications, calls, and messages. Nomo-phobia is a fear of not having the MP around. Saudi Arabia is ranked the first of all countries of the Gulf Cooperation Council regarding the proportion of MP users [4].

Furthermore, sleep is crucial for preserving a person's physical and mental health. Smartphone usage might lead to sleep disturbance [5], which may affect the concentration level and academic performance[6]. However, little research has been done to determine the pattern of MP usage, and the relationship between usage and sleep quality[7] However, the real scale of this problem is largely unknown and no recent study related to this problem has been published in our area.

The present study aimed to assess extent of mobile use, and its possible impact on patterns of sleep quality disturbance among the general population.

Methodology

A cross-sectional study was conducted in Abha City, Aseer Region, Saudi Arabia that included adults aged > 18 years. The minimum sample size for this study was decided according to Swinscow and Cohen, [8] to be 385, (with z-value = 1.96; estimated prevalence in the population = 50%, and a precision level of 0.05).

Following a convenience sampling technique during the period from January to December 2020, the researchers interviewed 475 participants from community places, such as malls, in Abha City, Aseer Region, Saudi Arabia.

All respondents were exposed to the study questionnaire that was designed by the researchers. It comprised two data collection tools, as follows:

• **Smartphone Addiction Scale (SAS) [9]**.
It is a 33-item self-report measure explaining the behaviors associated with smartphone use. It is arranged into six subscales: "Daily-Life Disturbance, Positive Anticipation, Withdrawal, Cyberspace-Oriented Relationship, Overuse, and Tolerance". The measure utilizes a five-point Likert scale response format ranging from "1" (strongly disagree) to "5" (strongly agree), with a maximum total score of 165. It has high internal consistency (Cronbach's alpha = 0.97).

• **The Pittsburgh Sleep Quality Index (PSQI):**
It is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates "poor" from "good" sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month. It is a self-report questionnaire that assesses sleep quality over a 1-month time interval. The measure consists of 19 individual items, creating 7 components that produce one global score, and takes 5–10 minutes to complete. Developed by researchers at the University of Pittsburgh, the PSQI is intended to be a standardized sleep questionnaire for clinicians and researchers to use with ease and is used for multiple populations. A total score of "5" or greater is indicative of poor sleep quality [10].

Collected data were checked for completeness and were stored in a personal computer, edited, coded and entered using the Statistical Package for Social Sciences (IBM, SPSS version 26). Analyzed data were described as Mean±SD for quantitative variables and frequency and percentages for qualitative variables [11]. Student t-test was used to compare means of two different groups while one-way analysis of variance test (ANOVA) was adopted to compare means between more than two groups. P-values less than 0.05 were considered as statistically significant.

The researchers fulfilled all the required official and ethical approvals. Before interviewing, informed consent was obtained from all participants. All participants had the right not to participate in the study or to withdraw from the study prior to completion. The researchers explained the purpose of the study to all respondents. Confidentiality and privacy were guaranteed for all participants. This study was carried out at the full expense of the researcher.

Results

The study included 475 participants, whose ages ranged between 18 and 60 years with an arithmetic mean of 28.1 and standard deviation (SD) of ±8.4 years. Males represented 51.2%, 78.8% were university graduated and 44.6% were employees, as shown in Table 1.

Figure 1 shows that 83.8% of participants reported using smartphone mainly in social media, while 11.4% used it for internet access. Almost half of the participants (48.8%) considered themselves smartphone addicts, while 35.6% were not sure about that, as shown in Figure 2.

Table 1: Personal characteristics of participants (n=475)

	Frequency	Percentage
Gender		
• Male	243	51.2
• Female	232	48.8
Age in years		
• Range	18-60	
• Mean±SD	28.1±8.4	
Level of education		
• School	68	14.3
• University	374	78.8
• Postgraduate	33	6.9
Job status		
• Not working	85	17.9
• Student	178	37.5
• Employee	212	44.6

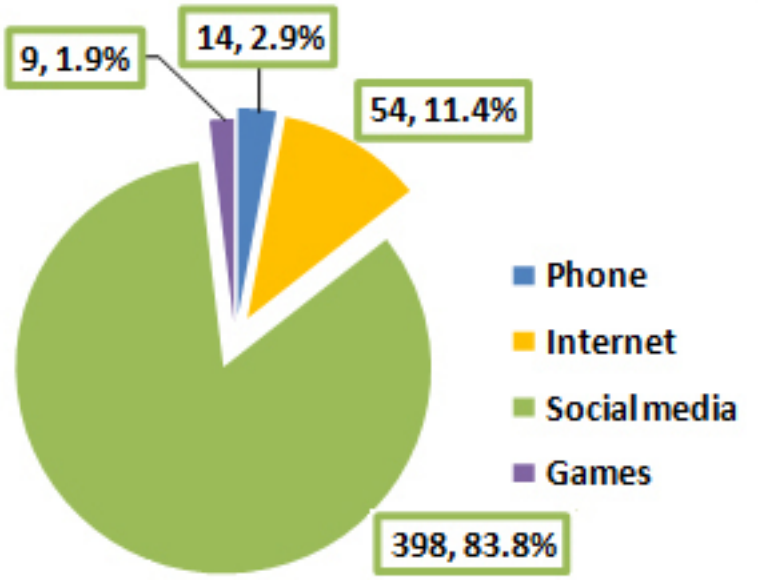

Figure 1: Main uses of smartphone among participants

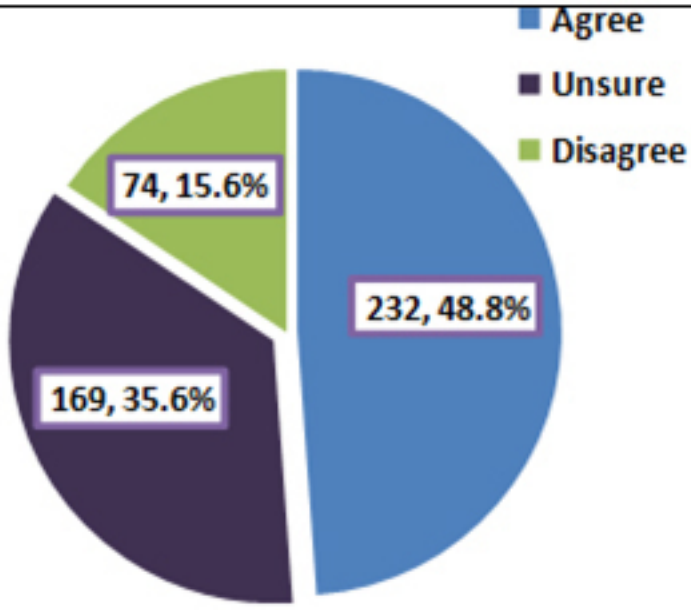

Figure 2: Self-reported smartphone addiction among participants

Table 2: Responses of participants to Smartphone Addiction Scale statements

Responses associated with smartphone use	Strongly disagree No. (%)	Disagree No. (%)	Neither agree nor disagree No. (%)	Agree No. (%)	Strongly agree No. (%)
Missing planned work	82 (17.3)	114 (24.0)	106 (22.3)	120 (25.2)	53 (11.2)
Having hard time concentrating in class, while doing assignments, or while working	0 (0.0)	126 (26.5)	105 (22.1)	110 (23.2)	134 (28.2)
Experiencing lightheadedness or blurred vision	104 (21.9)	164 (34.6)	57 (12.0)	109 (22.9)	41 (8.6)
Feeling pain in the wrists or at the back of the neck	84 (17.7)	112 (23.6)	59 (12.4)	150 (31.6)	70 (14.7)
Feeling tired and lacking adequate sleep	75 (15.8)	120 (25.3)	78 (16.4)	142 (29.9)	60 (12.6)
Feeling calm or cozy	55 (11.6)	78 (16.4)	170 (35.8)	124 (26.1)	48 (10.1)
Feeling pleasant or excited	31 (6.5)	74 (15.6)	143 (30.1)	165 (34.7)	62 (13.1)
Feeling confident	46 (9.7)	122 (25.7)	178 (37.5)	88 (18.5)	41 (8.6)
Being able to get rid of stress	52 (10.9)	86 (18.1)	115 (24.2)	157 (33.1)	65 (13.7)
There is nothing more fun to do	78 (16.4)	141 (29.7)	105 (22.1)	102 (21.5)	49 (10.3)
Life would be empty without smartphone	38 (8.0)	69 (14.5)	66 (13.9)	164 (34.5)	138 (29.1)
Feeling most liberal	40 (8.4)	99 (20.8)	118 (24.8)	146 (30.7)	72 (15.2)
Using a smartphone is the most fun thing to do.	70 (14.7)	149 (31.4)	102 (21.5)	104 (21.9)	50 (10.5)

Table 2 summarizes the responses of participants regarding the 33 statements of the SAS. Most participants (66.7%) either strongly agreed or agreed that they are using smartphones longer than they had intended, always thinking that they should shorten their smartphone use time (65.3%), that their life would be empty without their smartphone (63.6%), that their fully charged battery does not last for one whole day (61.9%), that they are preferring searching from their smartphone to asking other people (58.5%), and that they are checking social networking service sites, like Twitter or Instagram, right after waking up (58.3%). The overall score ranged between 37 and 161 (out of 165) with a mean±SD of 100.2±21.4.

Table 2 (continued): Responses of participants to Smartphone Addiction Scale statements

Responses associated with smartphone use	Strongly disagree No. (%)	Disagree No. (%)	Neither agree nor disagree No. (%)	Agree No. (%)	Strongly agree No. (%)
Won't be able to stand not having a smartphone	71 (14.9)	169 (35.6)	69 (14.5)	105 (22.1)	61 (12.8)
Feeling impatient and fretful when not holding smartphone	75 (15.8)	207 (43.6)	88 (18.5)	65 (13.7)	40 (8.4)
Having smartphone in mind even when not using it	86 (18.1)	177 (37.2)	78 (16.4)	100 (21.1)	34 (7.2)
I will never give up using smartphone even when daily life is already greatly affected by it	76 (16.0)	152 (32.0)	106 (22.3)	103 (21.7)	38 (8.0)
Getting irritated when bothered while using smartphone	60 (12.6)	130 (27.5)	108 (22.7)	127 (26.7)	50 (10.5)
Bringing smartphone to the toilet even when in a hurry to get there	130 (27.4)	95 (20.0)	52 (10.9)	116 (24.4)	82 (17.3)
Feeling great meeting more people via smartphone use	83 (17.5)	96 (20.2)	109 (22.9)	122 (25.7)	65 (13.7)
Feeling that relationships with smartphone buddies are more intimate than real-life friends	120 (25.3)	144 (30.1)	85 (17.9)	74 (15.6)	52 (10.9)
Not being able to use smartphone would be as painful as losing a friend	99 (20.8)	145 (30.6)	99 (20.8)	79 (16.6)	53 (11.2)
Feeling that smartphone buddies understand me better than real-life friends	119 (25.1)	153 (32.1)	101 (21.3)	68 (14.3)	34 (7.2)
Constantly checking smartphone so as not to miss conversations between other people on social networks	44 (9.3)	100 (21.1)	93 (19.6)	172 (36.1)	66 (13.9)
Checking social networking service sites after waking up	41 (8.6)	73 (15.4)	84 (17.7)	174 (36.6)	103 (21.7)
Preferring talking with smartphone buddies to hanging out with real-life friends or with other family members	138 (29.1)	135 (28.4)	111 (23.4)	60 (12.6)	31 (6.5)
Preferring searching from smartphone to asking other people	26 (5.5)	59 (12.4)	112 (23.6)	168 (35.3)	110 (23.2)
A fully charged battery does not last for one whole day	30 (6.3)	87 (18.3)	64 (13.5)	141 (29.7)	153 (32.2)
Using smartphone longer than intended	29 (6.1)	53 (11.2)	76 (16.0)	176 (37.1)	141 (29.6)
Feeling the urge to use smartphone again right after stopping using it	30 (6.3)	83 (17.5)	118 (24.8)	168 (35.4)	76 (16.0)
Having tried time and again to shorten smartphone use time, but failing all the time	50 (10.5)	115 (24.2)	101 (21.3)	134 (28.2)	75 (15.8)
Always thinking of shortening smartphone use time	30 (6.3)	52 (10.9)	83 (17.5)	186 (39.2)	124 (26.1)
People advise not to use smartphone too much.	86 (18.1)	156 (32.9)	77 (16.2)	99 (20.8)	57 (12.0)

Males had higher mean SAS score than females (102.05±21.48 versus 98.32±21.10), However, this difference was not significant (p=0.057). Those using smartphone in playing games expressed the highest SAS score compared to others (34.99±11.66, p=0.003). Job status and educational level were not significantly associated with SAS score, as shown in Table 3. There was a significant negative correlation between participants' age and their SAS scores (r= -0.112, p=0.015), as shown in Figure 3.

Table 3: Factors associated with smartphone addiction among the participants

	Smartphone addiction scale score (Mean±SD)	P-Value
Gender		
• Male (n=243)	102.05±21.48	
• Female (n=232)	98.32±21.10	0.057
Level of education		
• High school (n=68)	98.22±22.19	
• University (n=374)	100.07±21.24	
• Postgraduate (n=33)	106.15±20.53	0.206
Job status		
• Not working (n=85)	99.98±24.92	
• Student (n=178)	99.98±20.08	
• Employee (n=212)	100.53±20.95	0.962
Main use of smartphone		
• Phone (n=14)	90.93±16.93	
• Internet (n=54)	102.56±20.76	
• Social media(n=398)	99.90±1.05	
• Games (n=9)	134.99±11.66	0.003

Figure 3: Correlation between participants' age and total smartphone addiction scale score

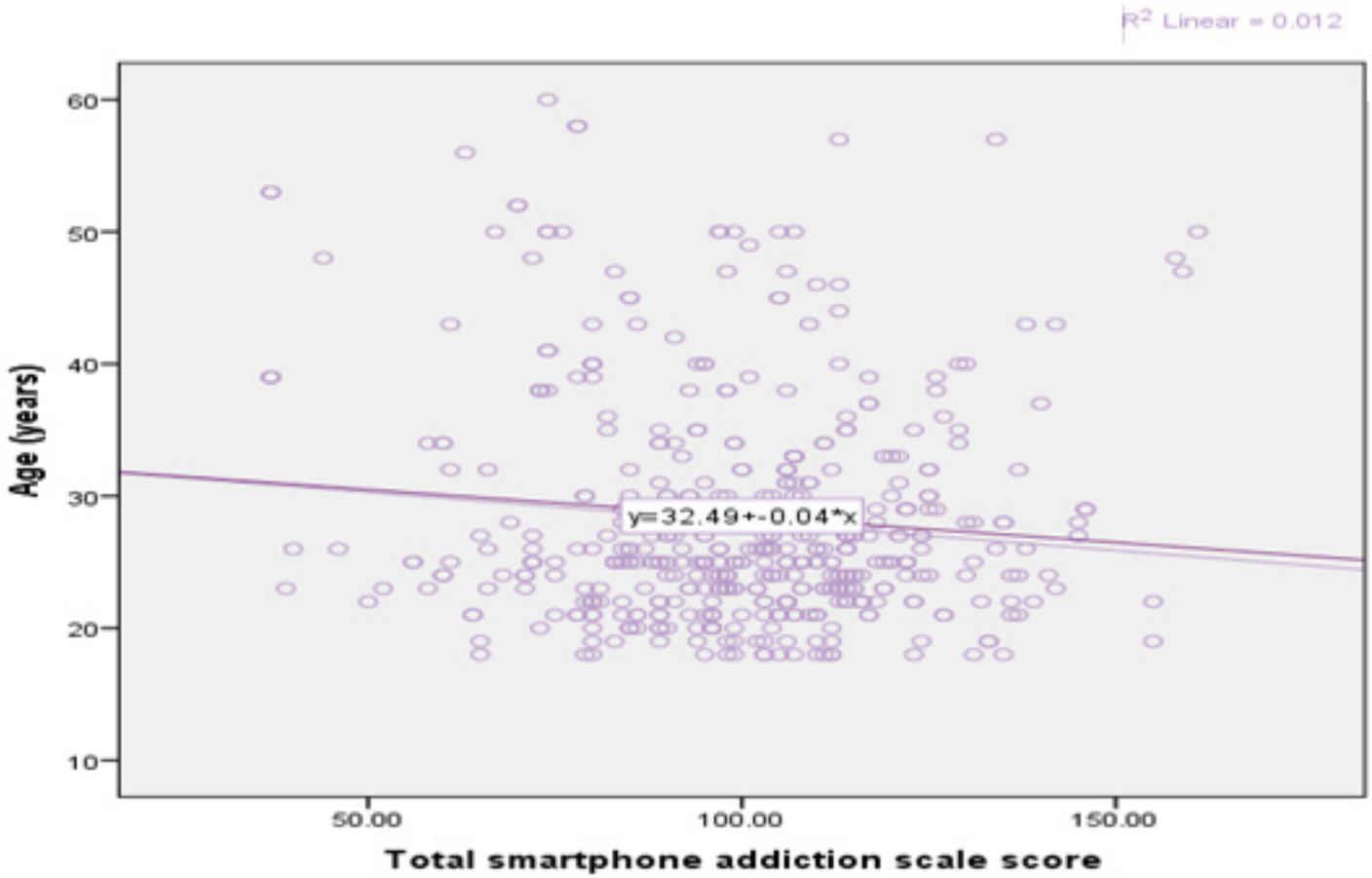

Figure 4 shows that 43.2% described their sleep quality as fairly good, whereas 23.2% and 16% described it as fairly bad and very bad, respectively. The overall, poor sleep quality, based on PSQI, was observed among 93.7% of participants, as shown in Figure.

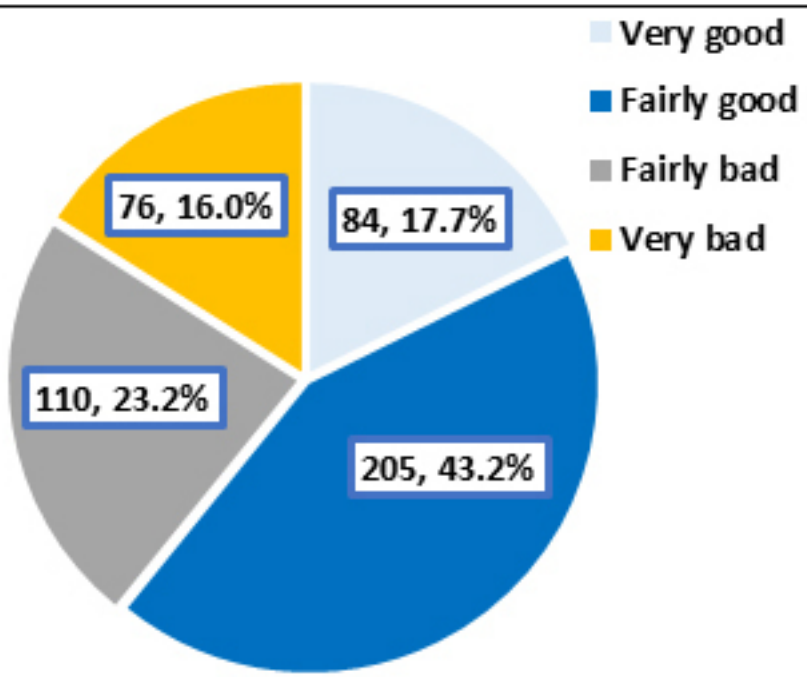

Figure 4: Subjective sleep quality among participants

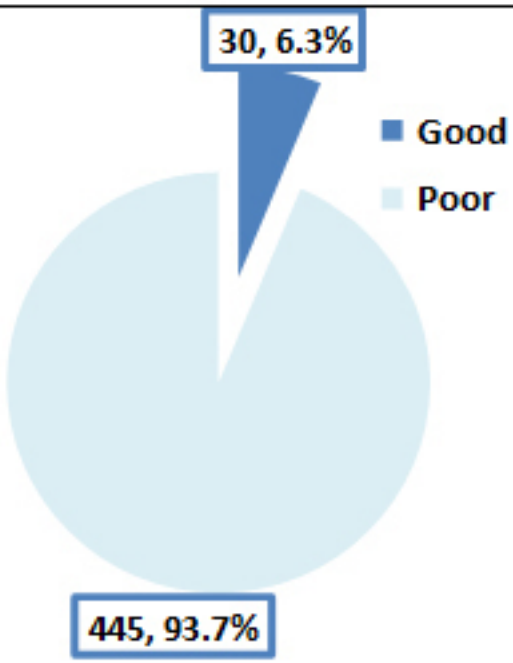

Figure 5: Overall sleep quality among the participants

Table 4: Sleep pattern among the participants in the past month

Sleep pattern	Frequency	Percentage
Duration in minutes to fall asleep each night		
• ≤15	111	23.4
• 16-30	199	41.8
• 31-60	93	19.6
• >60	72	15.2
Hours of actual sleep at night		
• <5	140	29.9
• 5-6	110	23.2
• 6-7	124	26.1
• >7	99	20.8
Hours in bed at night		
• <5	167	35.2
• 5-6	77	16.2
• 6-7	86	18.1
• >7	145	30.5
Habitual sleep efficiency		
• <65%	167	35.2
• 64-74%	77	16.2
• 75%-84%	86	18.1
• ≥85%	145	30.5

Table 4 shows that 41.8% of participants stayed between 16 and 30 minutes in bed before falling asleep each night in the past month whereas 15.2% of them stayed more than one hour. Moreover, from Table 5, more than one-third of them (35.2%) cannot get to sleep within 30 minutes three times or more a week in the past month. Only 20.8% of participants slept more than 7 hours per night in the past month while 29.9% of them reported sleeping for less than five hours each night. Habitual sleep efficiency was less than 65% among 35.2%, while it was 85% or above among 30.5% of them.

Table 5 shows that the commonest reported sleep troubles (three times or more in a week) during the past month, with the exception of sleep latency, were waking up in the middle of the night or early morning (30.5%), feeling too hot (17.3%), having to get up to use the bathroom (13.7%) and having pain (13.3%).

Table 6 shows that 5.1% reported using sleep medications three times or more a week to help in sleep in the past month. Having troubles staying awake while driving, eating meals or engaging in social activities in a frequency of three times or more a week were reported by 8.8% of participants in the last month. Additionally, 23.6% reported that three times or more a week, it has been a problem for them to keep up enthusiasm to get things done.

Table 5: Frequency of sleep troubles during the past month among the participants

	Not during the past month No. (%)	Less than once a week No. (%)	Once or twice a week No. (%)	Three times or more a week No. (%)
Cannot get to sleep within 30 minutes	83 (17.5)	109 (22.9)	116 (24.4)	167 (35.2)
Wake up in the middle of the night or early morning	104 (21.9)	122 (25.7)	104 (21.9)	145 (30.5)
Have to get up to use the bathroom	161 (33.9)	146 (30.7)	103 (21.7)	65 (13.7)
Cannot breathe comfortably	299 (62.9)	89 (18.7)	44 (9.3)	43 (9.1)
Cough or snore loudly	353 (74.3)	72 (15.2)	29 (6.1)	21 (4.4)
Feel too cold	256 (53.9)	104 (21.9)	70 (14.7)	45 (9.5)
Feel too hot	172 (36.4)	118 (24.8)	103 (21.7)	82 (17.3)
Have bad dreams	201 (42.3)	153 (32.2)	68 (14.3)	53 (11.2)
Have pain	265 (55.8)	95 (20.0)	52 (10.9)	63 (13.3)

Table 6: History of using sleep medications to help in sleep and daytime sleep dysfunction among participants

Variables	Not during the past month No. (%)	Less than once a week No. (%)	Once or twice a week No. (%)	Three times or more a week No. (%)
Using sleep medications	370 (77.9)	49 (10.3)	32 (6.7)	24 (5.1)
Having troubles staying awake while driving, eating meals or engaging in social activities	249 (52.4)	110 (23.2)	74 (15.6)	42 (8.8)
How much a problem has it been for you to keep up enthusiasm to get things done	141 (29.7)	119 (25.1)	103 (21.7)	112 (23.6)

Table 7 shows that the score of SAS was highest (108.70±20.90) among participants with subjective sleep quality of a score of 3 (very bad) and lowest (89.43±22.83) among those with subjective sleep quality score of zero (very good), $p<0.001$. Similarly, the score of SAS was highest (109.19±15.88) among participants with sleep latency of a score of 3 (>60 minutes) and lowest (91.95±21.31) among those with sleep latency score of zero (<15 minutes), $p<0.001$. Regarding sleep duration, the score of SAS was highest (104.93±22.64) among participants with sleep duration of a score of 3 (<5 hours) and lowest (95.52±19.76) among those with sleep duration score of 1 (6-7 hours), $p=0.001$. SAS score was highest (103.61±20.25) among participants with habitual sleep efficiency of a score of 3 (<65%) and lowest (96.54±22.46) among those with habitual sleep efficiency score of 0 (≥85%), $p=0.029$. SAS score was highest (106.68±19.68) among participants with daytime sleep dysfunction of a score of 2 (once or twice a week) and lowest (93.08±23.79) among those with daytime sleep dysfunction score of 0 (none), $p<0.001$. SAS score was significantly higher among participants with overall poor sleep quality compared to those with good sleep quality (101.04±21.03 versus 88.10±22.80), $p=0.001$.

Table 7: Association between smartphone addiction and sleep quality among participants

Sleep quality scores	Smartphone addiction scale score (Mean±SD)	P-Value
Subjective sleep quality		
• 0 (n=84)	89.43±22.83	
• 1 (n=205)	97.04±19.96	
• 2 (n=110)	108.55±17.64	
• 3 (n=76)	108.70±20.90	<0.001*
Sleep latency		
• 0 (n=43)	91.95±21.31	
• 1 (n=151)	93.99±20.57	
• 2 (n=167)	101.87±22.85	
• 3 (n=114)	109.19±15.88	<0.001*
Sleep duration		
• 0 (n=99)	97.11±21.30	
• 1 (n=124)	95.52±19.76	
• 2 (n=110)	102.26±20.09	
• 3 (n=142)	104.93±22.64	0.001*
Habitual sleep efficiency		
• 0 (n=145)	103.61±20.25	
• 1 (n=86)	100.38±19.21	
• 2 (n=77)	101.68±22.33	
• 3 (n=167)	96.54±22.46	0.029*
Sleep disturbances		
• 0 (n=17)	93.59±22.37	
• 1 (n=310)	100.16±20.11	
• 2 (n=141)	100.58±22.66	
• 3 (n=7)	112.29±39.69	0.271*
Use of sleeping medications		
• 0 (n=370)	99.56±21.29	
• 1 (n=49)	101.84±21.33	
• 2 (n=32)	98.06±22.37	
• 3 (n=24)	110.04±19.49	0.110*
Daytime dysfunction		
• 0 (n=102)	93.08±23.79	
• 1 (n=167)	96.89±19.43	
• 2 (n=157)	106.68±19.68	
• 3 (n=49)	105.84±20.77	<0.001*
Overall sleep quality		
• Good (n=30)	88.10±22.80	
• Poor (n=445)	101.04±21.03	0.001**

Discussion

In the present study, almost half of participants considered themselves smartphone addicts while more than a third of them were not sure about that. Furthermore, the mean±SD of smartphone addiction scale was 100.2±21.4 (out of a possible 165). These findings indicate a considerable rate of smartphone addiction among adult population in our community. Quite similar findings were observed in a study carried out among medical students in India using a short form of SAS where 44.7% were smartphone addicts[12]. In Jeddah, most medical students (73.4%) reported using their smartphones for more than 5 hours per day and the most frequently used applications were social media, similar to what has been reported in the present study [13]. In Turkey, Demirci et al. [2] used the SAS-33 items, and reported that the mean score among university students was 75.68±22.46, which is lower than that reported in the current study. However, in South Korea, a mean score of 110.02 has been reported among adolescents, [14] which is higher than that observed in the current study.

Worldwide, prevalence rates of smartphone addiction among the general populations ranged between 9.3% and 48% [15-17]. Differences between various studies could be attributed to differences in adopted scales and/or study populations.

In the current survey, higher scores of SAS were observed among males, although not significantly different. Similar results have been reported in India among medical students [12] and in Turkey among university students [2]. However, other studies carried out in Saudi Arabia,[13] Korea[18] and Turkey[5] reported that females were more smartphone addicts than males. Generally, differences between males and females regarding smartphone addiction varied from one culture to another according to the smartphone usage patterns or purpose [2] .

Most participants in the present study (93.7%) had poor sleep quality. Lower rates were reported in other studies carried out in India,[12] Palestine[19] and Jeddah,[20] where approximately two-thirds of participants had poor sleep quality.

The current survey revealed an association between smartphone addiction from one side and subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, daytime sleep dysfunction and overall sleep quality, on the other side. Similar findings have been reported by some other studies[12, 21]. In Saudi Arabia, smartphone addiction was associated with negative impacts, not only on sleep quality, but also on levels of energy, eating behaviors, body weight, exercise, and academic achievements[22].

In the USA, the longer average times spent on the smartphones through the time in bed was associated with lowering sleep efficiency, increased sleep onset latency and overall poor quality of sleep[23]. In Jeddah, Saudi Arabia, smartphone dependence score was associated with subjective sleep quality and sleep latency[13].

White et al. also reported that excessive mobile phone use was associated with poor sleep quality[24]. Demirci et al. observed that smartphone addiction was positively correlated with subjective sleep quality, daytime dysfunction, sleep troubles, and overall PSQI global scores[2].

In Switzerland, smartphone usage was associated with later bedtimes, however, it was not associated with sleep disturbance[25]. In Turkey, there were significant positive correlations between the SAS scores and subjective sleep quality, sleep disturbance, daytime dysfunction, and PSQI global scores,[13] while in Taiwan, no association was found between smartphone usage and sleep duration[26].

In accordance with Christensen et al.,[23] prevalence of smartphone addiction was shown to decrease with age in the current study. Therefore, we can say that smartphone addiction is mainly a problem for the young population.

Our study has some limitations that should be addressed. The cross-sectional design of the study that explores associations and not causality between independent variables and the outcome variable is considered a limitation of the study. Conduction of the study following convenience sampling in big malls could have played a role in confusion of participants during the assessment of smartphone use and sleep quality. Nevertheless, this study could have public health significance in evaluating this problem in a heterogeneous group of population, particularly among the young population in our region.

In conclusion, smartphone addiction is an evident problem among our population, particularly younger ones. People who use smartphones mainly for playing games are more likely to suffer from its addiction. Smartphone addiction is associated with long sleep latency, shorter sleep duration, lower sleep efficiency, higher daytime sleep dysfunction and overall poor sleep quality.

Based on findings of the current study, it is recommended to organize educational programs in public places to alert people, particularly younger ones regarding the harmful effects of prolonged use of smartphones. Mass media and social media should play more active roles in this regards. Further studies are needed to explore various psychological and physiological adverse outcomes of smartphone addiction.

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Prevalence of Irritable Bowel Syndrome (IBS) Among Teachers in Abha City; Saudi Arabia

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Abstract

Background: The Irritable Bowel Syndrome (IBS) is part of the larger group of functional gastrointestinal (GI) disorders that despite differences in location and symptom patterns, share common features with regard to their motor and sensory physiology, central nervous system (CNS) relationships, and the approach to patient care. This study aimed to estimate the prevalence and correlates of IBS among teachers in Abha city.

Methodology: A descriptive cross sectional survey approach was used for conducting the current research including teachers working in different schools. Data were collected from teachers using a pre-structured self-administered questionnaire by the researchers. Data collected covered teachers socio-demographic data, work related data including work years and work load, and their family history of IBS. Teachers' classification for being IBS positive or IBS negative cases was detected using ROME criteria.

Results: The research included 578 teachers, 55.9% of them were females and 75.6% were married. IBS was recorded among 35.5% of the teachers. IBS was more recorded among females than males. Logistic regression model included all teachers' demographic and work data among which gender, income, chronic health problems, and work load were found to be statistically significant predictors for IBS status.

Conclusions & recommendations: In conclusion, the study revealed that about one third of the teachers had IBS. IBS subtype M was the most frequent, especially among females with high income and high work load.

Key words: Irritable bowel syndrome, inflammatory bowel disease, GIT disturbance, Stress, Teachers, Bowel disorders.

Background

Irritable bowel syndrome (IBS) is a disease that affects both small and larger intestine. It has no clear pathology but can be presented by a group of symptoms including abdominal pain and changes in the pattern of bowel movements (1). Disease symptoms emerge over a long time period, often years (2). Symptoms usually occur as acute attacks that subside within one day, but with a tendency for recurrence (4). There may also be urgency for bowel movements, a feeling of incomplete evacuation (tenesmus), bloating, or abdominal distension (5). These urgent symptoms may be relieved by bowel movements (6). People with IBS, more commonly than others, have gastroesophageal reflux, symptoms relating to the genitourinary system, chronic fatigue syndrome, fibromyalgia, headache, backache, and psychiatric symptoms such as depression and anxiety (7, 8). About a third of men and women who have IBS also report sexual dysfunction typically in the form of a reduction in libido (9). It has been classified into four main types depending on whether diarrhea is common, constipation is common, both are common, or neither occurs very often (IBS-D, IBS-C, IBS-M, or IBS-U respectively) (1). IBS negatively affects quality of life and may result in missed school or work (10). Disorders such as anxiety, major depression and chronic fatigue syndrome are common among people with IBS (1, 9).

The causes of IBS are not clear (11). Theories include combinations of gut–brain axis problems, gut motility disorders, pain sensitivity, infections including small intestinal bacterial overgrowth, neurotransmitters, genetic factors, and food sensitivity (2). Onset may be triggered by an intestinal infection, (12) or stressful life event (13). IBS is a functional gastrointestinal disorder (1). Diagnosis is based on symptoms in the absence of worrisome features and once other potential conditions have been ruled out (3). Worrisome features include onset at greater than 50 years of age, weight loss, blood in the stool, or a family history of inflammatory bowel disease (14). Other conditions that may present similarly include celiac disease, microscopic colitis, inflammatory bowel disease, bile acid malabsorption, and colon cancer (15).

Teachers are a vital group in the community who deal with age groups of students who are dynamic and have many demands and expectations with unexpected behaviour and teachers are asked to deal with them calmly and with wisdom. This puts teachers always under stress, besides their academic affairs which all may induce irritable bowel syndrome. The current study aimed to assess the prevalence of irritable bowel syndrome among teachers with associated clinical profiles.

Methodology

A descriptive cross sectional survey approach was used for conducting the current research. A total of 578 teachers working in different schools (Public & Private including International schools) in Abha city were included. Teachers from areas outside Abha sector and those with inflammatory bowel disease were excluded. Data were collected from teachers using a pre-structured self-administered questionnaire by the researchers after intensive literature review and after experts' consultation for tool validity and clarity. Questionnaires were distributed to all accessible teachers after explaining the purpose of the research and confirming confidentiality of data and re-collected after two hours. Response rate exceeded 95% after excluding those who did not match inclusion criteria and those with incomplete questionnaire data. Data collected covered teachers' socio-demographic data, work related data including work years and work load, and their family history of IBS. Teachers' classification for being IBS positive or IBS negative cases was detected using ROME criteria (16).

Data analysis

After data was extracted, it was revised, coded and fed into statistical software IBM SPSS version 22. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant. Descriptive analysis based on frequency and percent distribution was done for all teachers' demographic and work related data with ROME criteria findings. Distribution of IBS among teachers according to their demographic characteristics and work related data was tested using Pearson chi-square test. Multiple logistic regression model was used to assess the most important predictors for having IBS among study cases.

Results

The research included 578 teachers, 55.9% of them were females and 75.6% were married. About 86% of the included teachers had monthly income exceeding 5000 SR. Smoking was recorded among 13.5% of the teachers and about 25% had a chronic health problem mainly diabetes and asthma (6% for each). Exactly 55.5% of the teachers were in governmental schools and 65% of them teach at primary and secondary school grades. As for teaching years, 43.9% of the teachers had worked for more than 10 years and about 80% of them teach 10 classes or more weekly (Table 1).

With regard to ROME criteria findings (Table 2a and b), 32.9% of teachers were previously diagnosed as IBS cases. More than 6% had abdominal pain daily or more and pain association with bowel movement with change in stool nature was recorded uniformly among teachers. Pain was recorded for 6 months or more among 50.3% of cases. Constipation was recorded among 29.6% of the cases while 27.5% had constipation and diarrhea. About 33% of the teachers had work absence due to pain and 21.1% had lost weight recently. Appetite change was recorded among 26.4% of the cases.

Totally, IBS was recorded among 35.5% of the teachers (Figure 1). Detailed types were recorded such that 36.6% of IBS cases were of subtype M followed by subtype C (29.8%), subtype D (22.4%), and subtype U (11.2%) (Figure 2).

Table 3 shows distribution of having IBS with teachers' demographic data. It was clear that IBS was more recorded among females than males (41.5% vs. 27.8%) with recorded statistical significance (P=.001). Also 22.5% of teachers with low income had IBS compared to 45.9% of those with high income (P=.002). As for smoking, 34.6% of smokers had IBS compared to 31.3% of non-smokers (P=.005). Marital status and chronic health problem showed an insignificant relation with IBS status.

As for work related data (Table 4), 41.5% of teachers at primary schools had IBS compared to 37.9% of those at high schools (P=.007). Also 23.1% of teachers with only recent teaching experience had IBS compared to 35% of those who had experience for more than 10 years (P=.026).

Finally, logistic regression model included all teachers' demographic and work data among which gender, income, chronic health problems, and work load were found to be statistically significant predictors for IBS status. As for gender, male teachers recorded doubled risk for having IBS compared to females keeping all other factors constant (OR=2.3; 95% CI: 1.66-3.18). As for monthly income, lower income was associated with 68% more risk for having IBS than high level income adjusting for all other factors (OR=1.68; 95% CI: 1.30-2.16). Smoker teachers recorded doubled probability for having IBS compared to none and ex-smokers (OR=2.03; 95% CI: 1.45-2.84). Also teachers with chronic health problems had 53% more likelihood for IBS compared to others who are free of chronic health problems (OR=1.53; 95% CI: 1.13-2.08). Finally, those with high work load had double likelihood for having IBS (OR=2.01; 95% CI: 1.32-2.59).

Table 1: Bio-demographic data of teachers in Abha City, Saudi Arabia

Bio-demographic data		No	%
Gender	Male	255	44.1%
	Female	323	55.9%
Marital status	Married	437	75.6%
	Unmarried	141	24.4%
Monthly Income	Less than 5000 SR	80	13.8%
	5000-15000 SR	363	62.8%
	More than 15000	135	23.4%
Smoking status	Non-smoker	364	63.0%
	Ex-smoker	136	23.5%
	Smoker	78	13.5%
Do you have any chronic disease?	None	434	75.1%
	Hypertension	32	5.5%
	Diabetes Mellitus	39	6.7%
	Asthma	38	6.6%
	Thyroid problems	13	2.2%
	Others	22	3.8%
What is your sector?	Government school	321	55.5%
	Private school	184	31.8%
	International school	73	12.6%
Which level do you teach?	Kindergarten	52	9.0%
	Primary school	229	39.6%
	Secondary school	152	26.3%
	High school	145	25.1%
How many years have you worked as a teacher?	< 5 years	78	13.5%
	5-10	246	42.6%
	> 10 years	254	43.9%
How many classes do you teach per week?	< 10 classes	116	20.1%
	10-15	270	46.7%
	> 15 classes	192	33.2%

Table 2a: ROME criteria of teachers in Abha City, Saudi Arabia

ROME criteria		No	%
Have you been diagnosed before with Irritable Bowel Syndrome	Yes	190	32.9%
	No	388	67.1%
Family history of IBS	Yes	265	45.8%
	No	313	54.2%
In the last 3 months, how often did you have pain anywhere in your abdomen?	Never	74	12.8%
	< 1 day/ month	74	12.8%
	1 day/ month	60	10.4%
	2-3 days/ month	84	14.5%
	Once/ week	76	13.1%
	2-3/ week	75	13.0%
	Most days	93	16.1%
	Daily	33	5.7%
	Many times/ day	9	1.6%
How often did this pain happen close in time to bowel movement	0%	89	15.4%
	10%	75	13.0%
	20%	53	9.2%
	30%	65	11.2%
	40%	65	11.2%
	50%	87	15.1%
	60%	46	8.0%
	70%	37	6.4%
	80%	30	5.2%
	90%	20	3.5%
	100%	11	1.9%
How often did your stools become either softer than usual or harder than usual when you had this pain?	0%	71	12.3%
	10%	58	10.0%
	20%	57	9.9%
	30%	63	10.9%
	40%	52	9.0%
	50%	93	16.1%
	60%	58	10.0%
	70%	45	7.8%
	80%	42	7.3%
	90%	20	3.5%
	100%	19	3.3%

Table 2b: ROME criteria of teachers in Abha City, Saudi Arabia

ROME criteria, continued		No	%
How often did your stools become either more frequent or less frequent than usual when you had this pain?	0%	85	14.7%
	10%	75	13.0%
	20%	48	8.3%
	30%	71	12.3%
	40%	53	9.2%
	50%	81	14.0%
	60%	46	8.0%
	70%	44	7.6%
	80%	34	5.9%
	90%	22	3.8%
	100%	19	3.3%
Has it been 6 months or longer since you started having this pain?	Yes	291	50.3%
	No	287	49.7%
In the last 3 months, when you had abnormal stools, what were they usually like?	Usually constipation	171	29.6%
	Usually diarrhea	95	16.4%
	Both diarrhea and constipation	159	27.5%
	Not applicable	153	26.5%
Did you absent from your work because of the Abdominal pain?	Yes	193	33.4%
	No	385	66.6%
If Yes, How often did you absent from your work because of this pain?	Never	387	67.0%
	Once a week	22	3.8%
	Once in fortnight	44	7.6%
	Once a month	66	11.4%
	Less than Once/Month	59	10.2%
Did you notice any blood in your stool?	Yes	0	0.0%
	No	578	100.0%
Have you felt you lost weight recently?	Yes	122	21.1%
	No	456	78.9%
Did you notice any change in your appetite?	No	402	69.6%
	Increase	84	14.5%
	Decrease	92	15.9%

Figure 1: Prevalence of IBS among teachers in Abha city, Saudi Arabia

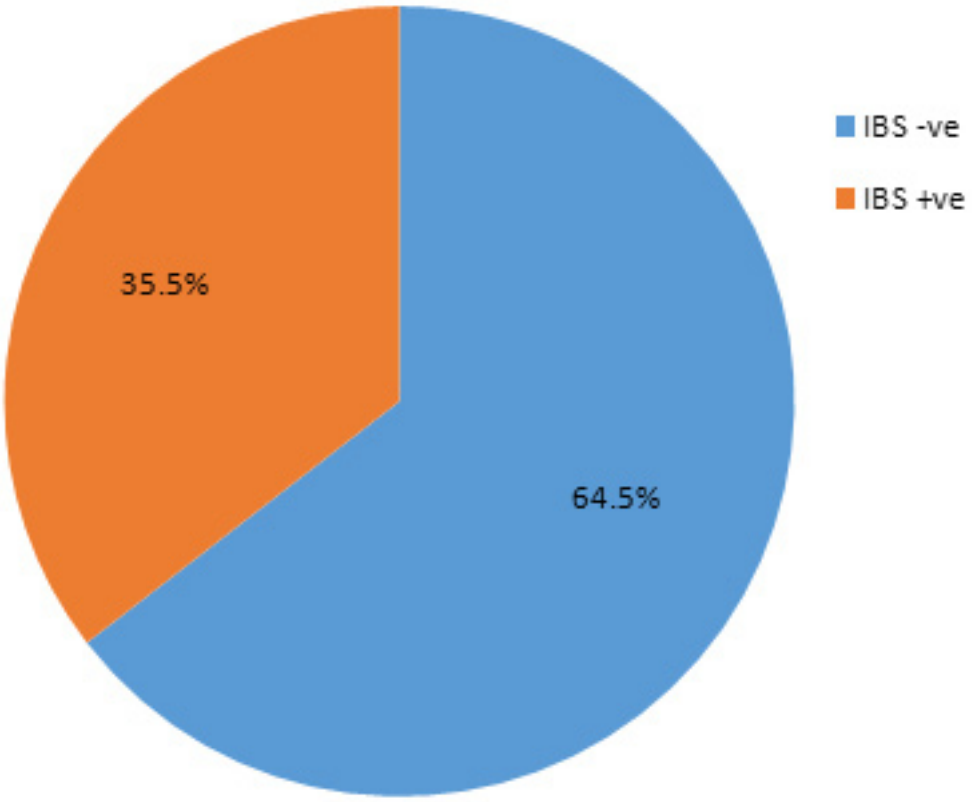

Figure 2: Subtypes of IBS among teachers in Abha city, Saudi Arabia

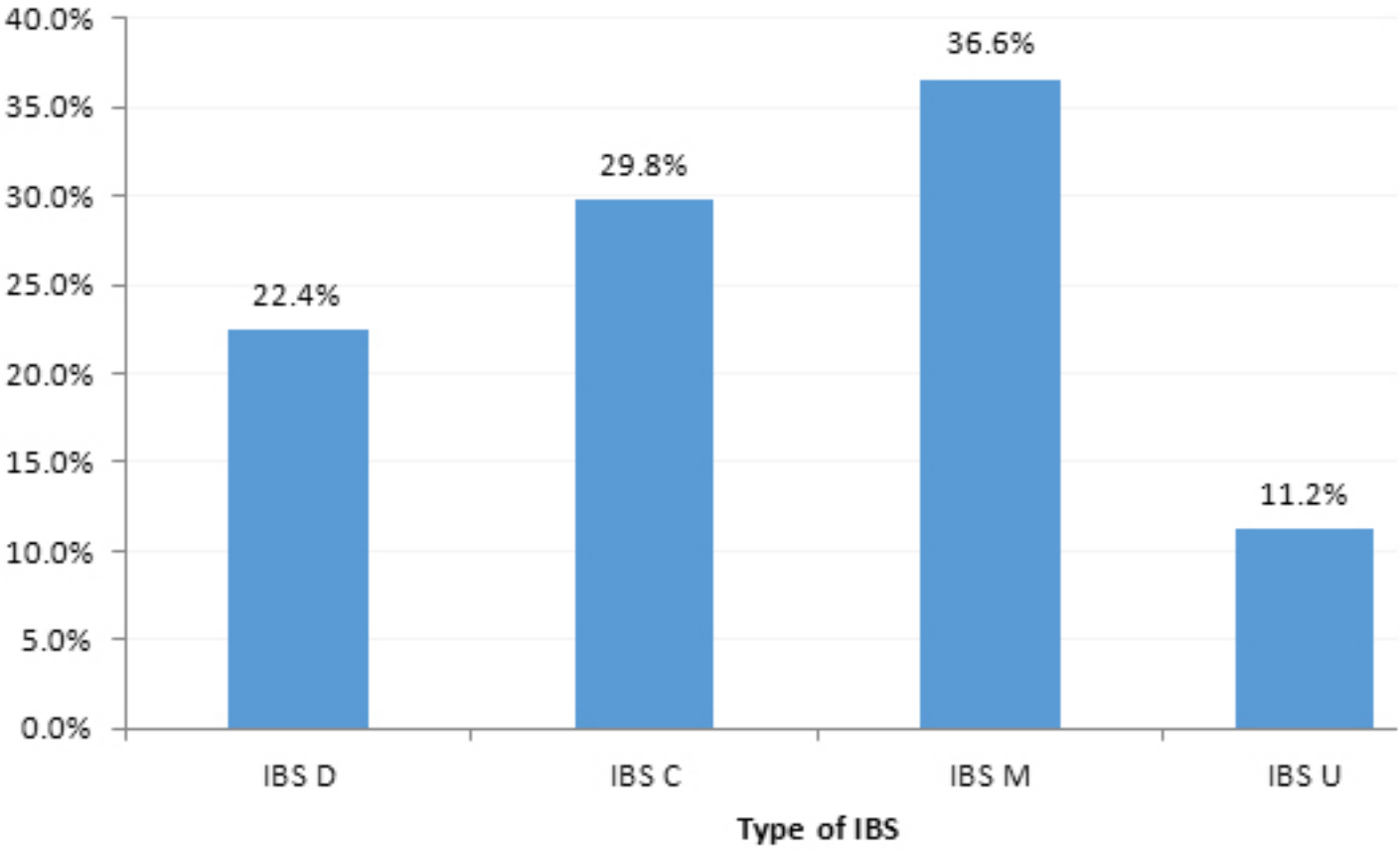

Table 3: Relation of having IBS with teachers' personal data, Abha city, Saudi Arabia

Personal data		Diagnosis				P
		IBS -ve		IBS +ve		
		No	%	No	%	
Gender	Male	184	72.2%	71	27.8%	.001*
	Female	189	58.5%	134	41.5%	
Marital status	Married	284	65.0%	153	35.0%	.687
	Unmarried	89	63.1%	52	36.9%	
Monthly Income	Less than 5000 SR	62	77.5%	18	22.5%	.002*
	5000-15000 SR	238	65.6%	125	34.4%	
	More than 15000	73	54.1%	62	45.9%	
Smoking status	Non-smoker	250	68.7%	114	31.3%	.005*
	Ex-smoker	72	52.9%	64	47.1%	
	Smoker	51	65.4%	27	34.6%	
Do you have any chronic disease?	None	284	65.4%	150	34.6%	.742
	Hypertension	21	65.6%	11	34.4%	
	Diabetes Mellitus	23	59.0%	16	41.0%	
	Asthma	22	57.9%	16	42.1%	
	Thyroid problems	7	53.8%	6	46.2%	
	Others	16	72.7%	6	27.3%	

P: Pearson X2 test * P < 0.05 (significant)

Table 4: Relation of having IBS with teachers' work data, Abha city, Saudi Arabia

Work data		Diagnosis				P
		IBS -ve		IBS +ve		
		No	%	No	%	
What is your sector?	Government school	209	65.1%	112	34.9%	.583
	Private school	114	62.0%	70	38.0%	
	International school	50	68.5%	23	31.5%	
Which level do you teaching?	Kindergarten	34	65.4%	18	34.6%	.007*
	Primary school	134	58.5%	95	41.5%	
	Secondary school	115	75.7%	37	24.3%	
	High school	90	62.1%	55	37.9%	
How many years have you worked as a teacher?	< 5 years	60	76.9%	18	23.1%	.026*
	5-10	148	60.2%	98	39.8%	
	> 10 years	165	65.0%	89	35.0%	
How many classes do you teach per week?	< 10 classes	74	63.8%	42	36.2%	.748
	10-15	171	63.3%	99	36.7%	
	> 15 classes	128	66.7%	64	33.3%	

P: Pearson X2 test * P < 0.05 (significant)

Table 5: Results of multiple logistic regression model for predictors of IBS among teachers in Abha city, Saudi Arabia

Predictor	B	S.E.	P	OR_A	95% C.I.for OR)	
					Lower	Upper
Teacher	.22	.32	.491	1.24	.67	2.31
Female	.83	.17	.001*	2.30	1.66	3.18
Unmarried	.03	.17	.857	1.03	.74	1.45
Income	.52	.13	.001*	1.68	1.30	2.16
Smoking	.71	.17	.001*	2.03	1.45	2.84
Diseases	.43	.16	..006*	1.53	1.13	2.08
Private school	.03	.11	.807	1.03	.83	1.28
Grade	.01	.08	.918	1.01	.87	1.17
Teaching years	-.04	.11	.711	.96	.77	1.20
Work load	.70	.13	.003*	2.01	1.32	2.59
Constant	-3.23	.67	.001	.04		
Model pseudo R2; Significance					0.12; .001*	
Model accuracy					71.3%	

B: Regression coefficient SE: Standard error CI: Confidence interval ORA: Adjusted odds ratio

Discussion

Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder presenting with frequent abdominal pain or discomfort associated with a change in bowel habits. IBS is a common health problem and growing financial burden on patient and health care facilities, that affects health care costs directly and indirectly (17). IBS mainly occurs between the ages of 15 and 65 years, with incidence and prevalence nearly equal in both adults and adolescents. IBS is troublesome and should not be underestimated because it carries a significant negative impact on quality of life and social functioning in many patients, like decrease in concentration, energy, vitality and self-confidence, with increase in absence rates from schools and work places (18). There are no IBS-specific biological, structural or biochemical markers to aid diagnosis, but abdominal pain or discomfort is a key symptom for its diagnosis and doctors generally diagnose by excluding other GI diseases and mainly depend on symptom based criteria, after elimination of alarming features (Red Flag Signs). Accurate and timely diagnosis, together with appropriate intervention, is critical for optimal management of the condition (19).

The current study aimed to assess prevalence and correlates of IBS among teachers in Abha city including all teachers in governmental and private schools.

The study revealed that one third of the teachers had IBS, especially subtype M which means one out of each 3 teachers complain of uncomfortable IBS symptoms. On focusing on ROME criteria, it was noticed that a very small percentage of the teachers answered negatively (either never, no, or 0%) for the different annoying symptoms and signs. Also a considerable portion of teachers had appetite change and weight loss due to IBS correlates.
IBS was recorded more among female teachers which may be due to their greaterresponsibilities and family demands and this can be better explained by that IBS was more recorded among teachers with high income and many years of education. This may be due to the high stress and dependence on outdoor meals. Also smokers with high work load and chronic health problems recorded more IBS positive findings than others due to stress of work load or being worried about health problem.

Teaching is one of the most stressful jobs which causes tension due to social and academic responsibilities. Identification of health related problems which may affect teachers' work ability and their quality of life should be considered and be under focus because of direct impact of their job on the community and generations.

Conclusions and Recommendations

In conclusion, the study revealed that nearly 1 out of each 3 teachers had IBS. IBS subtype M was the most frequent especially among females with high income and high work load. Female gender with high income, presence of chronic health problems, and high work load were the most important predictors for having IBS. Teachers as cornerstone staff in building future generations and community should periodically undergo clinical and psychological evaluation to avoid such hidden disorders which affect their ordinary life and consequently their work performance.

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Leadership styles and job satisfaction among healthcare providers in primary health care centers

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Abstract

Background: Effective leadership is essential for the success of any organization, while job satisfaction relates to how content an individual is with his or her job. This study aimed to explore the relationship between managers' leadership styles and job satisfaction among healthcare workers in primary healthcare centers (PHCCs) in Aseer Region, Saudi Arabia.

Methods: Following a cross-sectional design, this study was carried out at 25 PHCCs in Abha and Khamis Mushait cities, Saudi Arabia. The study comprised 25 PHCCs managers and 300 PHC providers. Survey instruments included a brief sociodemographic survey questionnaire, the "Multifactor Leadership Questionnaire, Form 6-S", and the validated Arabic version of "Job Satisfaction Survey Questionnaire".

Results: Only 52% of PHCC mangers attended training on leadership, 68% highly followed transformational leadership facet "idealized influence", and 64% followed "management-by-exception", while only 28% highly followed the "Laissez-faire" leadership style. About one-third of healthcare providers were satisfied, 9.3% were dissatisfied, while 51.3% were ambivalent. Laissez-faire leadership style significantly correlated with most healthcare providers' job satisfaction items, followed by transactional leadership.

Conclusion: Job satisfaction is significantly less among pharmacists, those having insufficient income, or less experience in PHC. Laissez-faire leadership significantly correlates with most job satisfaction items, followed by transactional and transformational leaderships. It is necessary to improve PHC providers' job satisfaction by better application of transformational and transactional leadership styles.

Key words: Primary healthcare, Leadership, Job satisfaction

Introduction

Healthcare facilities components are varied and complex. The components include services, staff and consumers [1]. Leadership is the ability of leaders to change the way followers think and act, [2] as well as how their groups perform their functions [3]. Leadership is a relationship between the leaders and followers [4].

An effective leadership results in a successful business in the organization [5]. The authority of the leaders is changed by changing of the healthcare facilities from hierarchically structured entities to networked organizations. This change in leadership authority involves change from transactional (TA) to transformational (TF) leadership style [6,7].

Alkassabi et al. [5] stated that transformational leadership is a leadership style that can stimulate and inspire followers to both achieve extraordinary outcomes and, in the process, develop their own leadership capacity. On the other hand, transactional leadership, is a managerial leadership, that focuses on the role of supervision, organization, and group performance. Leaders who implement this style focus on specific tasks and use rewards and punishments to motivate followers

The TA style involves corrective and constructive types. In the constructive type, the leader works with groups or individuals and defines and sets up agreements in order to achieve specific work goals, whereas in the corrective type, the leader focuses on standards that are related to the tasks in the two types. The passive form involves performing no action until mistakes occur, whereas the active form involves close monitoring for the mistakes [8].

There are four major factors in the TF style, including inspirational motivation, idealized influence, individualized motivation and intellectual stimulation [8]. In this leadership style, leaders put the needs of the followers over their needs [9].

Job satisfaction is very important as it is considered a key factor that may affect the performance of individuals [10]. Job satisfaction is known as a positive emotion or pleasurable state resulting from job experience or appraisal of one‘s job [11]. It has been reported that job satisfaction is determined by several factors including utilization of skills, recognition, work condition, technical aspects, pay and job advancement [12,13]. Both job satisfaction of the employee and effective leadership are two factors for the success of the organization. The good leader can provide directions for the organization and lead the employees to achieve the desired goals [5].

The health sector is labor intensive, where service quality and efficiency are directly influenced by workers satisfaction and motivation. There are numerous publications recognizing effective leadership of health care as a core element for developing qualitative organizational culture and effective performance in health care provision. Significant positive associations between effective styles of leadership and high levels of patient satisfaction have been reported through providing a healthy work environment for the service providers [14].

Limited studies that address the relationship of leadership style with job satisfaction of health workers, have been undertaken in Saudi Arabia. A study was conducted in Aseer Central Hospital in Abha City among critical care nurses [15] and another was conducted in Riyadh among physiotherapists [16]. None of these studies focused on overall health care providers (doctor, nurse and paramedics) who are directly related with patient care. Over the past few decades, Saudi Arabia has witnessed enormous growth and change in health services. For the last five years, there is a noticeable change in the composition of the health care staff in PHCCs including more Saudi staff according to the 2030 Vision by replacing the non-Saudi staff. A previous study in Saudi Arabia demonstrated that bureaucratic leadership style was the most dominant one [17].

However, the present study intended to explore if the situation has changed with the inclusion of Saudi staff. Previous studies did not quantify the degree of satisfaction recorded for each leadership style but only explored the relation in path diagrams. This is covered by the present study.

PHC in Saudi Arabia constitutes the first line of contact between patients and the health care system, with about 82% of Ministry of Health clients attending the primary health care facilities [18]. Therefore, employees’ satisfaction is important to increase the performance and improve the quality of health care provided by PHCCs. Therefore, the current study intended to identify the leadership style and job satisfaction among PHC providers in the public sector in Aseer Region. It is expected that findings of the present study would also raise policy makers and managers’ awareness level and may help them to improve the leadership styles and level of job satisfaction of PHC providers.

Objectives

To explore the relationship between managers’ leadership styles and job satisfaction among health care workers in primary health care centers in Aseer Region.

Material and Methods

Following a cross-sectional analytical design, the present study was carried out at 25 primary health care centers (PHCCs) in Abha and Khamis Mushait cities, Saudi Arabia. The study population comprised managers of PHCCs and PHC providers.

The minimum sample size was calculated according to Suresh and Chandrashekara [7] to be 270 PHC providers (physicians, nurses, and paramedics). This sample size was necessary to estimate an expected moderate relation between leadership style and job satisfaction (r=0.5) [1], at

95% confidence level, cluster design effect = 2, provides a power of 90%. So the total sample of health workers was 270 and 25 PHC managers from 25 PHCCs in Abha and Khamis Mushait cities. The number of PHC managers was fulfilled, while the number of participant PHC providers reached 300.

A two-stage cluster sample technique was applied. At the first stage, 25 clusters (PHCCs) were selected, based on probability proportionate to the size for weighting clusters. At the second stage, 10-15 health care workers were selected from each included PHCC using systematic random sampling technique.

Data collection was conducted using the following three survey instruments:

- A brief sociodemographic survey questionnaire for both managers and healthcare staff, (including age, gender, marital status, education level, years of experience, monthly income, attending continuing medical education on management or leadership, specialty and job nature).
- The "Multifactor Leadership Questionnaire, Form 6-S" (MLQ6S), for identification of managers' leadership styles [8].
- The validated Arabic version of Job Satisfaction Survey (JSS) Questionnaire to measure the satisfaction level of the heath workers [9].

Data were analyzed using the Statistical Package for Social Sciences (IBM, SPSS version 25). Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the data. Independent samples t-test and analysis of variance (ANOVA) were used to identify the significant differences in job satisfaction scores according to healthcare workers' personal characteristics. Pearson's correlation was applied to assess the correlation between leadership and job satisfaction scores. Structural Equation Modelling (SEM) was applied for path analysis for the relation between managers' leadership styles and PHCCs subordinates' job satisfaction. All causal relationships between variables which is direct (leadership style with job satisfaction) were tested using the SPSS AMOS module based on the hypothesized relationships. Level of significance was considered at $p<0.05$.

A pilot study was conducted on 5 PHCC leaders. The objective of the pilot study was to test the data collection tools as regards their clarity, time needed to fill in the study questionnaires and to assess their test-retest reliability coefficient.

All necessary official permissions were fully secured before data collection. The ethical approval was obtained from the Research Ethical Committee in the General Directorate of Health Affairs, Aseer Region. Prior to data collection, the investigator explained the purpose of the study to all potential participants and assured them of the voluntary nature of participation, as well as the anonymity and full confidentiality of their responses. Participants' verbal consents to participate were obtained.

Results

Table 1 shows that the majority of PHCC managers were males (84%). Their age was mainly <35 years (44%). The majority were married (92%). More than half of managers (56%) had Bachelor Degrees. The income of 64% was sufficient. Almost half of them (48%) were graduates since >10 years, while 24% had more than 5 years' experience in PHC administration and 24% had > 5 years' experience in management. Only 52% of PHCC mangers attended training on leadership.

Table 2 shows that 68% of PHCC managers highly follow the transformational leadership facet "idealized influence", and 64% follow "management-by-exception" (a transactional leadership facet), while only 28% highly follow the "Laissez-faire" leadership style.

Table 3 shows that operating conditions and fringe benefits were the job satisfaction facets with least job satisfaction among healthcare providers (11.50±3.50 and 12.34±4.19, respectively). On the other hand, nature and supervision were the job satisfaction facets with highest job satisfaction among healthcare providers (19.74±4.55 and 19.23±4.37, respectively). The total mean satisfaction score of healthcare providers was 139.83±25.42. Regarding job satisfaction grades, 16.7% of healthcare providers were satisfied, 39.3% were dissatisfied, while 44% were ambivalent.

Table 4 shows that PHC healthcare providers' satisfaction total score (mean±SD) differed significantly according to PHCC managers' dominant leadership styles ($p=0.001$). Almost all satisfaction domains (promotion, supervision, contingent rewards, operating conditions, co-workers, nature of work and communication) differed significantly according to leadership styles ($p=0.012$, 0.004, 0.001, 0.014, 0.030, and 0.001, respectively).

Table 5 shows that total job satisfaction mean scores of PHC providers differed significantly according to their specialty ($p=0.006$), with highest mean job satisfaction score among nurses, and lowest among pharmacists (142.2±25.8 and 125.7±17.9, respectively). Job satisfaction mean score was significantly higher among those with sufficient monthly income than those with insufficient monthly income (144.5±25.0 and 125.9±21.4, respectively, $p<0.001$). Job satisfaction mean scores were also higher among those with more years since graduation (>10 years) and more than 5 years of experience in PHC ($p<0.001$ and $p=0.005$, respectively). However, their total job satisfaction mean scores did not differ significantly according to their gender, age groups, nationality, marital status, or qualification.

Table 1: Personal characteristics of primary health care managers

Personal characteristics	No.	%
Gender		
• Male	21	84.0
• Female	4	16.0
Age		
• <35 years	11	44.0
• 35-40 years	9	36.0
• >40 years	5	20.0
Marital status		
• Single	2	8.0
• Married	23	92.0
Qualification		
• Diploma	8	32.0
• Bachelor	14	56.0
• Postgraduate	3	12.0
Monthly income		
• Sufficient	16	64.0
• Insufficient	9	36.0
Years since graduation		
• =10 years	13	52.0
• >10 years	12	48.0
Years of experience in PHC administration		
• =5 years	19	76.0
• >5 years	6	24.0
Years of experience in administration		
• 1 year	9	36.0
• 2-5 years	10	40.0
• >5 years	6	24.0
Attending training on leadership	13	52.0

Table 2: Grades of leadership facets among participant primary health care managers (n=25)

Leadership facets	Low		Moderate		High	
	No.	%	No.	%	No.	%
Transformational						
• Idealized influence	1	4.0	7	28.0	17	68.0
• Inspirational motivation	0	0.0	10	40.0	15	60.0
• Intellectual stimulation	0	0.0	11	44.0	14	56.0
• Individual consideration	0	0.0	10	40.0	15	60.0
Transactional						
• Contingent reward	0	0.0	12	48.0	13	52.0
• Management-by-exception	1	4.0	8	32.0	16	64.0
Laissez-faire leadership	3	12.0	15	60.0	7	28.0

Table 3: Healthcare providers' job satisfaction scores and grades

Job satisfaction domains	Mean	SD
Pay	15.6	4.7
Promotion	13.4	4.5
Supervision	19.2	4.4
Fringe benefits	12.3	4.2
Contingent rewards	13.2	5.2
Operating conditions	11.5	3.5
Co-workers	18.6	4.2
Nature	19.7	4.6
Communication	16.3	4.4
Total satisfaction score	139.9	25.5
Total satisfaction grade	**No.**	**%**
Dissatisfied (Total satisfaction score < 118)	50	16.7
Ambivalent (Total satisfaction score 118-144)	132	44.0
Satisfied (Total satisfaction score > 144)	118	39.3

Table 4: Association between managers' dominant leadership styles and healthcare provider's satisfaction level

Satisfaction domains	Dominant leadership styles						P value
	Transformational		Transactional		Laissez-faire		
	Mean	SD	Mean	SD	Mean	SD	
Pay	17.0	3.6	15.6	4.9	15.0	4.7	0.056
Promotion	15.1	3.9	13.4	4.3	12.8	4.7	0.012*
Supervision	20.9	2.7	19.4	4.5	18.5	4.5	0.004*
Fringe Benefits	13.1	3.7	12.5	4.3	11.9	4.2	0.182
Contingent rewards	15.9	4.8	12.8	5.3	12.6	4.9	0.001*
Operating conditions	12.7	3.8	11.0	3.3	11.6	3.5	0.014*
Co-workers	20.1	2.7	18.5	4.3	18.3	4.4	0.030*
Nature of work	21.4	2.7	20.2	4.5	18.8	4.9	0.001*
Communication	17.7	4.2	16.4	4.6	15.7	4.3	0.027*
Total satisfaction	154.1	16.7	139.7	27.2	135.1	24.7	0.001*
Satisfaction grade	No.	%	No.	%	No.	%	
Dissatisfied	0	0.0	23	18.7	27	20.5	0.001*#
Ambivalent	15	33.3	51	41.5	66	50.0	
Satisfied	30	66.7	49	39.8	39	29.5	

P: One-Way ANOVA **#: Pearson X^2 test** *** P<0.05 (statistically significant)**

Table 5: Primary health care providers' total job satisfaction scores (Mean±SD) according to their personal characteristics

Personal characteristics	No.	%	Mean	SD	P-value
Gender					
• Male	128	42.7	137.6	22.9	
• Female	172	57.3	141.5	27.1	0.182
Age					
• <30 years	80	26.7	140.3	28.9	
• 30-40 years	186	62.0	139.1	24.3	
• >40 years	34	11.3	142.7	23.2	0.734
Nationality					
• Saudi	251	83.7	140.0	26.0	
• Non-Saudi	49	16.3	138.8	22.5	0.752
Marital status					
• Single	82	27.3	141.2	26.7	
• Married	215	71.7	139.1	25.0	
• Divorced	3	1.0	157.7	18.2	0.391
Qualification					
• Diploma	112	37.3	143.1	23.8	
• Bachelor	164	54.7	136.8	24.7	
• Master	14	4.7	139.3	37.3	
• Doctorate	8	2.7	151.8	32.0	
• Others	2	0.7	160.0	26.9	0.123
Specialty					
• Physician	70	23.3	137.3	25.1	
• Nurse	102	34.0	142.2	25.8	
• Dentist	26	8.7	136.7	14.2	
• Pharmacist	29	9.7	125.7	17.9	
• Technician	21	7.0	140.1	29.1	
• Others	52	17.3	148.0	28.3	0.006
Monthly income					
• Sufficient	225	75.0	144.5	25.0	
• Insufficient	75	25.0	125.9	21.4	<0.001
Years since graduation					
• <5 years	66	22.0	142.6	28.1	
• 5-10 years	155	51.7	134.5	23.5	
• >10 years	79	26.3	148.0	24.4	<0.001
Years of experience in PHC					
• ≤5 years	195	65.0	136.8	24.8	
• >5 years	105	35.0	145.4	25.7	0.005

Table 6 shows that PHC providers' job satisfaction scores correlated positively and significantly with scores of some leadership facets. Pay satisfaction correlated significantly and positively with management-by exception and Laissez-faire leadership (r=0.117, p=0.043, and r=0.141, p=0.014, respectively). Promotion satisfaction correlated significantly and positively with contingent reward (r=0.156, p=0.007). Supervision satisfaction correlated significantly and positively with management-by exception and Laissez-faire leadership (r=0.191, p=0.001, and r=0.207, p<0.001, respectively). Co-workers satisfaction correlated significantly and positively with contingent reward, management-by exception and Laissez-faire leadership (r=0.141, p=0.014, r=0.185, p=0.001, and r=0.231, p<0.001, respectively). Nature satisfaction correlated significantly and positively with individual consideration, contingent reward, and Laissez-faire leadership (r=0.114, p=0.048, r=0.152, p=0.008, and r=0.116, p=0.045, respectively). Communication satisfaction correlated significantly and positively with management-by exception and Laissez-faire leadership (r=0.172, p=0.003, and r=0.175, p=0.002, respectively). Their total satisfaction scores correlated significantly and positively with contingent reward, management-by exception and Laissez-faire leadership (r=0.144, p=0.012, r=0.164, p=0.004, and r=0.171, p=0.003, respectively).

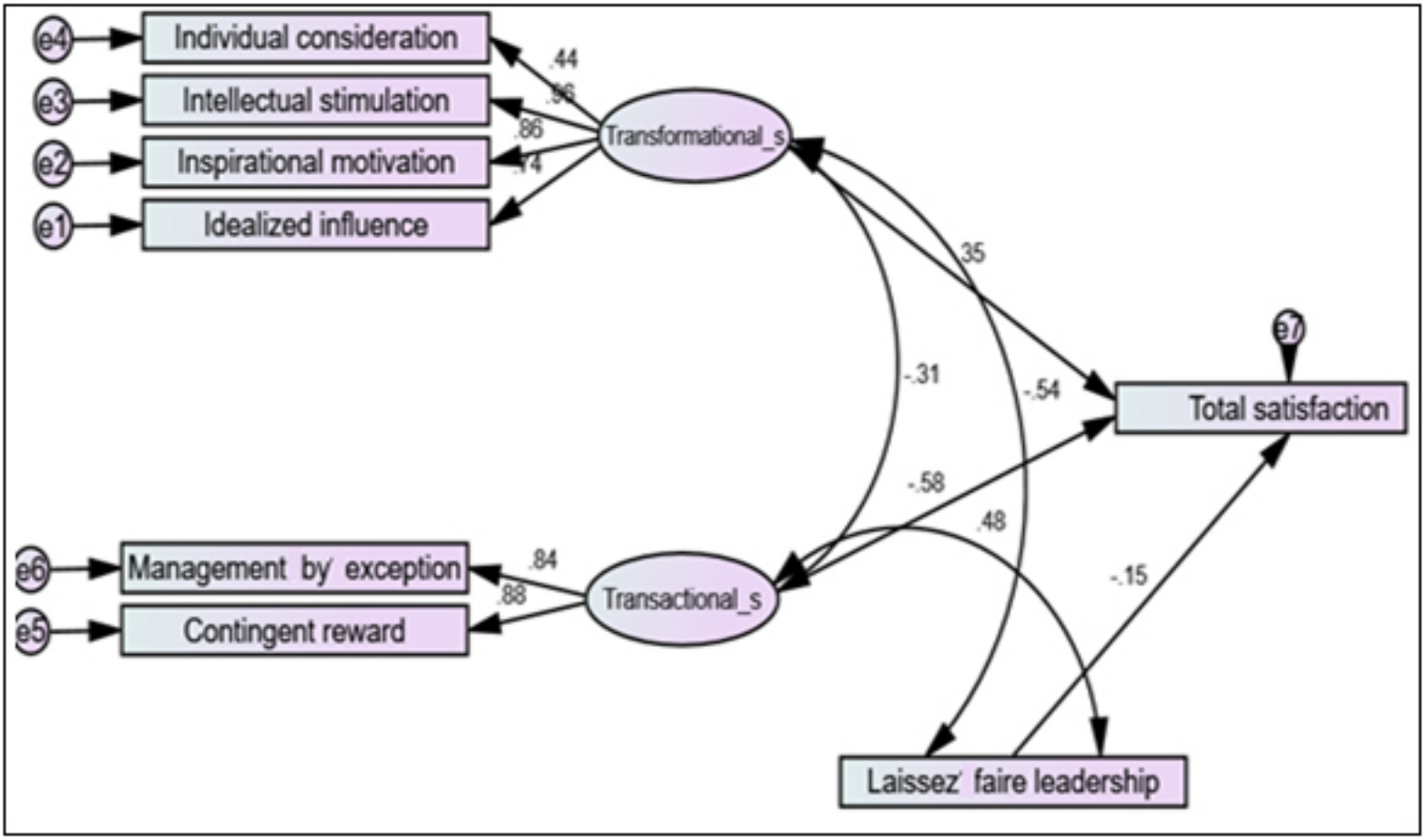
Table 6: Correlation between primary health care providers' job satisfaction scores and their managers' leadership scores

Satisfaction Items		Transformational leadership				Transactional leadership		Laissez Faire
		II	IM	IS	IC	CR	ME	
Pay	r	0.040	0.030	0.053	0.086	0.078	0.117	0.141
	p	0.489	0.609	0.363	0.135	0.176	0.043§	0.014§
Promotion	r	0.054	0.043	0.089	0.100	0.156	0.101	0.098
	p	0.353	0.456	0.124	0.084	0.007§	0.080	0.090
Supervision	r	0.082	0.030	-0.008	0.050	0.112	0.191	0.207
	p	0.156	0.603	0.897	0.391	0.053	0.001§	<0.001§
Fringe benefits	r	0.036	0.041	0.007	0.055	0.034	0.049	0.017
	p	0.535	0.475	0.904	0.343	0.555	0.401	0.770
Contingent Rewards	r	0.087	0.020	0.060	0.072	0.075	0.083	0.016
	p	0.133	0.732	0.301	0.215	0.193	0.154	0.782
Operating Conditions	r	0.019	-0.091	-0.059	-0.060	-0.013	-0.037	-0.020
	p	0.737	0.114	0.308	0.074	0.820	0.524	0.726
Co-workers	r	0.084	-0.033	-0.013	0.043	0.141	0.185	0.231
	p	0.146	0.575	0.820	0.461	0.014§	0.001§	<0.001§
Nature	r	0.046	0.073	0.086	0.114	0.152	0.069	0.116
	p	0.429	0.208	0.140	0.048§	0.008§	0.237	0.045§
Communication	r	0.111	0.019	0.024	0.095	0.082	0.172	0.175
	p	0.054	0.747	0.675	0.102	0.158	0.003§	0.002§
Total	r	0.098	0.027	0.047	0.101	0.145	0.164	0.171
	p	0.089	0.641	0.421	0.081	0.012§	0.004§	0.003§

§ Statistically significant
(II) Idealized influence (IM) Inspirational motivation (IS) Intellectual stimulation
(IC) Individual consideration (CR) Contingent reward (ME) Management-by-exception

Figure 1 shows the SEM for the relation between managers' leadership styles and PHC providers' job satisfaction. The magnitude of each path coefficient indicated the relative strength and direction (positive or negative) of the relationships between the variables. Each path coefficient measured the partial correlation between the two latent variables after the joint correlations between all the other variables had been removed, or "partialled out".

Figure 1: Structural Equation Modelling (SEM) for the relation between managers' leadership styles and PHCCs subordinates' job satisfaction



Discussion

Results of the present study revealed that the most commonly adopted leadership styles at PHCCs in Aseer Region, Saudi Arabia were the TF leadership, followed by the TA leadership, mainly the management-by-exception facet, while the laissez-faire leadership was least adopted.

Asencio and Mujkic [10] indicated that TF leadership is usually preferred, since it builds higher trust in organizations, which grows motivation among employees, resulting in higher individual and organizational performance. Grimm [11] argued that both TF and TA leadership styles can be effective if executed properly. Nidadhavolu [12] noted that the TA leadership style is equally important as the TF leadership style in guiding leaders to enhance organizational competitiveness, but it is not associated with the same levels of morality when compared with the TF leadership. A disadvantage of the TA leadership style is the lack of employees' motivation to produce more than what is specified.

The low adoption of laissez-faire leadership style at PHCCs in Aseer Region may reflect the fact that this leadership style does not necessitate high management skills, and it proves effective only when the staff are motivated and skilled [13].

Regarding job satisfaction, findings of this study revealed that only 39.3% of primary healthcare providers were satisfied, and 9.3% were dissatisfied, while the rest were ambivalent [i.e., neither satisfied nor dissatisfied]. Several facets were associated with low job satisfaction, i.e., "Operating conditions" and "fringe benefits", while "nature of work" and "supervision" were associated with high job satisfaction.

These findings are in agreement with those reported by several studies. In Saudi Arabia, there is a reported lack of leadership effectiveness in the primary health care sector in Aseer Region, associated with dissatisfied professionals [6]. In Al-Madina A-Munawwara, Al Juhani and Kishk [14] reported that most PHC nurses and physicians were not satisfied. Least satisfaction domains comprised "professional opportunities", "patient care" and "financial reward". In Riyadh, Aldrees et al. [15] reported that almost one-third of physicians at a tertiary care hospital were job-dissatisfied.

In Cairo, Egypt, Morsy et al. [16] reported that almost half of PHC physicians' job dissatisfaction was encountered in almost half of PHC physicians. Their job dissatisfaction was mainly associated with pay, fringe benefits and contingent rewards. In Punjab, India, Singh et al. [17] reported that two-thirds of healthcare providers were satisfied with their jobs, only 2.8% were dissatisfied, while 31.2% were ambivalent. Job dissatisfaction was mainly associated with "fringe benefits" and "contingent rewards". Moreover, unmet hygiene factors, e.g., "operating conditions", and "nature of work" were also associated with job dissatisfaction. In USA, Landon et al. [18] reported that between 1997 and 2001 primary healthcare physicians' job satisfaction decreased from 42.4% to only 38.5%.

Singh et al. [17] stressed that the motivating factors, such as "pay", "fringe benefits", and "contingent rewards" should be fulfilled for healthcare workers to be job-satisfied. They also

explained the high prevalence of ambivalent job satisfaction among healthcare providers by the independence of hygiene and motivational factors. Healthcare providers become dissatisfied when their working conditions [i.e., hygiene factors] are weak, while when the hygiene factors are improved, they become not dissatisfied, but not necessarily satisfied (i.e., ambivalent).

The current study found that PHC providers' job satisfaction differed significantly according to their specialty, with highest job satisfaction among nurses, and lowest among pharmacists. Moreover, job satisfaction was significantly higher among those with sufficient monthly income, those with more years since graduation, and those with more than 5 years of experience in PHC practice. However, job satisfaction mean scores did not differ significantly according to their gender, age groups, nationality, marital status, or qualification.

It is to be noted that healthcare staff's salary was significantly and positively associated with job satisfaction among healthcare providers in several studies [16-17, 19]. Lee [20] explained this finding by that low salary can negatively affect the peace of mind and hence, healthcare providers' satisfaction. Individuals who are happy outside their work due to their satisfaction regarding their income, are also more likely to be job satisfied. Ehsan Malik [21] reported significant associations between payment, promotion opportunity, and job satisfaction. They recommended that health systems should consider these variables to retain healthcare staff.

In Al-Madina A-Munawwara, Saudi Arabia, Al Juhani and Kishk [14] reported that job satisfaction among PHC providers was higher among older, more experienced, non-Saudi physicians than their counterparts. In Egypt, Morsy et al. [16] found that more experienced physicians had higher job satisfaction compared to those with less experience in medical practice. Similarly, Alcaraz-Mor et al. [22], in Punjab, India, found that more experienced physicians were more job satisfied.

Singh et al. [17] noted that pharmacists had the highest job satisfaction and lab technicians followed by physicians. Jaiswal et al. [23], in Delhi, India, reported that technicians, in tertiary care hospitals were the least satisfied. They attributed variations in job satisfaction among healthcare workers to their educational qualifications, improper recruitment policies, and limited career growth opportunities.

Several studies reported no significant differences in healthcare providers' job satisfaction according to their personal characteristics, namely, gender, age or marital status [17; 24; 25]. However, Behmann et al. [26] found that male German PHC physicians were more satisfied than female colleagues. In Egypt, Morsy et al. [16] reported that married PHC physicians had higher job satisfaction than single physicians.

The variation in job satisfaction among healthcare providers reported by different studies may be attributed to cultural variations, differences in study populations and job satisfaction assessment tools.

The present study showed that PHC providers' job satisfaction scores correlated positively and significantly with scores of some leadership facets, mainly the "laissez-faire" and the TA leadership styles. The "laissez-faire" leadership style correlated with five satisfaction items, namely, "pay", "supervision", "co-workers", "nature", and "communication". Regarding the TA leadership style, "Contingent reward" correlated with "promotion", "co-workers", and "nature", while "management by exception" correlated with "pay", "supervision", "co-workers", and "communication". Regarding the TF leadership style, the "individual consideration" facet correlated positively and significantly only with "nature" satisfaction item.

Yi-Feng [27] stressed that employees' extent of job satisfaction can be determined by leadership styles. Job satisfaction of subordinates is significantly supported by successful leadership, and leaders play an important role in promoting employees' job satisfaction [10]. Folakemi et al. [28] reported a significant positive correlation between contingent reward, of the TA leadership style, and job satisfaction among employee at universities Guest Houses in South-West Nigeria ($r=0.267$, $p<0.001$). They concluded that contingent reward significantly improves the employees' job satisfaction.

The positive correlation between TA leadership style and job satisfaction was discussed by Giltinane [29], who noted that TA leadership is task-oriented, where rewards are given based on subordinates' performance. Nevertheless, Fernandes and Awamleh [30] reported that TA leadership style has little influence on job satisfaction among employees of international companies in the United Arab Emirates.

The present study revealed that the "laissez-faire" leadership style positively and significantly correlated with most healthcare providers' job satisfaction items. This finding may be explained by that none of the participant 25 PHC managers were physicians, but most of them were health administrators with little or moderate previous clinical qualifications. Moreover, about half of managers of PHCCs did not attend any training on leadership. Therefore, the laissez-faire leadership seems to be currently the most accepted by healthcare staff at PHCCs in Aseer Region.

Lockwood [13] described the laissez-faire leadership style as a participatory leadership, with limited direct control over the decision-making process within institutions. Leaders usually show little interference and they allow staff members to make decisions independently. Frequently, decisions are left to team members, and leaders do not contribute as active members in the team. With little guidance, leaders leave team members to achieve the daily work on their own, while the leaders remain available for feedback or consultation.

Saleem [31] explained the association between TA leadership style and job satisfaction. They stated that TA leaders apply rewards or punishments according to extent of achieved targets. Rewards can be in the form of promotion and salary increments, while punishments may be in the form of termination or a cut in salary increments [32].

Asghar and Isaiah [33] argued that neither TA nor TF leadership styles are always capable of improving employees' job satisfaction. Despite the fact that employees may prefer the inspiration and consideration aspects of TF leadership, or favor the contingent rewards aspect of TA leadership, the effectiveness of TA and TF leadership styles often vary from one situation to another.

Study limitations

The present study has few limitations. The causal relationship between factors affecting satisfaction cannot be confirmed as the study design is cross-sectional, which is good for hypothesis generation, rather than hypothesis testing.

Conclusions

Based on findings of this study, it can be concluded that managers of PHCCs in Aseer Region mainly adopt the idealized influence facet of TF leadership and management-by-exception facet of TA leadership, while the Laissez-faire leadership is highly adopted by only about one quarter of managers. Regarding job satisfaction of healthcare providers, about one-third are job-satisfied, while half of them are ambivalent. Job satisfaction is significantly less among pharmacists, those having insufficient monthly income, and those with less experience in PHC. The laissez-faire leadership style positively and significantly correlates with most healthcare providers' job satisfaction items, followed by TA leadership and lastly TF leadership.

Managers of PHCCs need to be trained in leadership. It is necessary to improve PHC providers' job satisfaction, which is expected to be achieved by better application of TF and TA leadership styles.

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Impact of MRCGP [INT] Examination on Family Physicians' Knowledge and Practice: Doctors' and Patients' Perceptions

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Abstract

Background: Family practice or general practice is a field of medicine that stresses comprehensive primary health care. A membership exam MRCGP [INT] was launched in 2006 by RCGP for South Asian countries to drive up standards of care provision in the community.

Aim: The aim of this study was to determine the family physicians' change in knowledge due to sitting the MRCGP [INT] and its impact on their attitudes and practice in Pakistan.

Design: Mixed method study.

Study Setting: Clinics of GPs/FPs in Karachi (65 GPs participated)

Method: The study was conducted in two phases. In phase 1, 65 doctors who had passed MRCGP [INT] were interviewed and a focus group was also held to assess the FPs/GPs perceptions. In phase II, patients were interviewed regarding the practice of the FPs/GPs. A pre-tested structured questionnaire was used for data collection. Analysis was carried out using SPSS version 16 and knowledge scores were generated.

Results: In this study, Major areas of strength are patient centered approach 68%, holistic care 56%. Overall patient satisfaction was found to be 52%. Moreover, all the participants in the focus group acknowledged that MRCGP has indeed brought a positive change in their knowledge and consultation skills.

Conclusion: Increased patient awareness has challenged health professionals, to not only increase their knowledge base, but also to incorporate this within their everyday practice. Hence, professional examinations such as MRCGP [INT] can be a reliable way for the FPs/GPs to keep their knowledge level updated.

Key words: Family Physicians,
general practitioners, patient centered approach, consultation skills

Introduction

Family practice or General Practice is a field of medicine that stresses comprehensive health care for the individual, regardless of the age or sex of the patient, with special emphasis on family's health(1). Family physicians/General Practitioners (GPs) (2) are considered as the back bone of health care systems. They are the first contact physicians for most of the patients and make up a high proportion of the doctors consulted by the Pakistani population. They are capable of providing care for the majority of conditions encountered in the ambulatory setting and integrate all necessary health care services along with provision of preventive and rehabilitative services to each member of the family.

Most of these GPs are working in their own independent practice and are unable to receive any formal postgraduate training in their field. In addition, a demonstration of commitment to continuous professional development (CPD) is not yet mandatory for practicing doctors in Pakistan, therefore the majority of these practicing physicians are unfamiliar with continuous medical education(3) lack updated knowledge, and in turn are unable to provide quality health care.

Keeping the above-mentioned concerns in view, representatives from family medicine colleges in Sri Lanka, Bangladesh, India, Nepal, and Pakistan (4) met in 2003 and discussed the feasibility of using an accreditation in family medicine to drive up standards of care provision in the community. It was felt that studying to obtain a recognized qualification would stimulate appropriate learning, and in turn improve practice. For this purpose, a membership exam MRCGP [INT] was launched in 2006 (5) by the Royal College of General Practitioners UK for South Asian countries. All GPs having five years of general practice of which 3 years should be in Family Medicine and 2 years in subspeciality were eligible to appear in the exam (6). It is a two-part exam, in which a candidate must pass an acquired knowledge test in multiple choice formats to be eligible to sit the clinical OSCE exam.

The main aim of this study was to determine family physicians' change in knowledge due to sitting the MRCGP [INT] and their attitudes and perceptions regarding the impact of the MRCGP [INT] examination on their practice in Pakistan. To the best of the authors' knowledge, no studies have been conducted on the importance of this training in Pakistan. Moreover, in this case it provides local evidence, directly relevant to a wider context of training in Pakistan, that assessment drives learning. This in turn could strengthen the argument for further recognition and support for such qualifications at an institutional and national level within South Asian countries.

Methods

This mixed method study was conducted between October to December in Karachi. The study was conducted in two phases. In phase I doctors who had passed MRCGP [INT] in the last 3 years were identified from the list obtained by College of Family Physicians Karachi and were approached in their respective clinics and a knowledge questionnaire was administered. A total of 65 FPs/GPs who provided written informed consent were included in the study. We excluded those, who were preparing or recently sat the MRCGP [INT] examination since they might have a different knowledge level.

In phase II of the study, the research team specifically trained for the study purpose visited the clinics of the FPs/GPs and the patients (of specific FPs/GPs) were interviewed after taking informed written consent regarding their physician's practice. Patients diagnosed with any serious psychiatric disorder, who were agitated or in severe pain, were excluded from the study. Before the initiation of the data collection, the FPs/GPs and patients were assured anonymity and standard measures were taken for maintaining confidentiality. The study was reviewed and approved by the Ethical Review Committee of the Aga Khan University.

A pre-tested structured questionnaire was used for data collection formulated by consulting the experts in the field. The FPs/GPs' questionnaire included knowledge-based scenarios on the common illnesses prevalent in the community like: management of hypertension, malaria and tuberculosis etc. The questionnaire was in English language however, it was translated in Urdu and then was back translated to English to check for consistency between both versions.

A modified version of the General Practice Assessment Questionnaire (GPAQ) was used to obtain patient perception on clinical practice of the physician. Studies have documented that it's an internally reliable instrument (7-9). The questionnaire was available in English and Urdu languages and a modified Urdu version of GPAQ was used for data collection.

Analysis was carried out using the Statistical Package for Social Sciences (SPSS), version 19. Descriptive statistics in terms of proportions for categorical variables and means and standard deviations for continuous variables were generated. To assess the knowledge level of FPs/GPs frequencies of all questions related to knowledge were calculated. All the correct answers were given a '1' mark and incorrect '0' and at the end all the correct answers were summed up and scores were dichotomized based on the median split of the scores. Any scoring above the median was categorized as having adequate knowledge and below the median as having inadequate knowledge.

Patients' perspective related to their GPs/FPs consultation skills was assessed through GPAQ and their responses were marked on a 5-point Likert scale. However, for

analysis purposes the categories of agreement and disagreement were merged to form a binary variable.

Focus group: It was of 30 minutes' duration and conversations were audio taped. The hand written notes were double checked with the audio recordings. Interview transcripts were assembled and analyzed to identify themes. The data were independently coded by two researchers and the discrepancies were resolved by discussion.

Results

A total of 65 FPs/GPs were enrolled on the basis of the eligibility criteria and the response rate of 100%. Table 1, represents the Sociodemographic and academic characteristics of the FPs/GPs. Fifty-one percent of the FPs/GPs were between 36 to 45 years and 72% were females. Moreover, 43% of the doctors were practicing for more than 15 years and the majority, 71% of them did not receive any structured training. Overall, 69% of the FPs/GPs had an adequate knowledge score on the scenario-based questions. A substantial number of FPs/GPs were attending CME sessions however; 20% of them were attending on a quarterly basis. In addition, almost all the participants (86%) attended a preparatory course at a private institution. The participants responded that the main source of information for MRCGP [INT] was friends 25% and CME/seminars/workshop 23%.

Figure 1 depicts reasons for taking MRCGP [INT] examination as reported by the Family Physicians. The main reason for taking this exam was to improve knowledge and skills as stated by the majority of physicians 65%, however, 22% of physicians opted for an exam to achieve monetary gains and promotions, while 20% took the examination due to peer pressure.

Figure 2 shows the Major areas of strength of GPs/FPs consultation style as perceived by their patients. Major areas of strength are patient centered approach 68%, holistic care 56%. Overall patient satisfaction was found to be 52%.

Figure 3 depicts comparison of perception of GPs/FPs with or without structured training regarding Impact of MRCGP [INT] exam on their clinical skills. This graph shows improvement in overall skills however all the domains of consultation and communication skills are better in FPs/GPSs who have undergone structured training.

MRCGP focus group Results:
The focus group consisted of 5 females and 4 male doctors. There were 5 general practitioners, 2 fellows and 2 internists. General practitioners had 5 years, while fellows had 3 years and internists had 2 years working experience respectively.

Motivation for the exam:
There were different reasons for doctors to appear in the exam. Amongst them peer pressure and update knowledge were the most common and followed by better job opportunities and monetary benefits etc.

"Majority of my friends' have achieved higher degrees and are working on senior posts in different institutions so I also decided to appear in this exam and achieve some higher degrees"

"I decided to appear in this exam because I wanted to update my knowledge and improve my patient's satisfaction level"

Modification in Practice:
All the participants felt improvement in their practice, specifically in making a diagnosis and offer cost effective management plan which is hallmark of general practice. They were of the opinion that their consultations have become more patient centered now and they are involving patients in decision making.

"Before appearing in the MRCGP [INT] exam I used to refer the majority of the cases to subspecialty but now after clearing exam I have become more confident and can deal with the majority of clinical problems more confidently".

Another important issue was ability to offer cost effective management plan (investigations and treatment). All of them were of the opinion that improved diagnostic ability has helped them and now they offer cost effective management plan for their patients.

"Previously, I used to advise a lot of investigations to make a diagnosis, now I only offer few selected investigations"
Patient satisfaction is a strong measure in the evaluation of quality of care as it reflects the experiences of those who receive care. All the participants agreed that they have seen improvements in their patient satisfaction levels.

"There is increase in number of patients and follow up and they are more satisfied."

"My counseling skills and diagnostic skills have improved and my patients are more satisfied"

Two internists also appeared in the exam and they also felt improvement in their practice

"After giving this exam we are capable of dealing with children and females, previously we use to only see medical problem now our horizon of practice has widened"

Holistic approach towards the patient was another important modification in clinical practice felt by everyone in the group.

"Previously there was no concept of a holistic approach; now we are dealing with patient as a whole rather than giving just symptomatic treatment to our patients"

Motivation for attending further CMEs:
All of them agreed that attending regular continuous medical education sessions has contributed to update their knowledge.

"Previously it seemed that we are far behind in medical knowledge than our friends who were working in different academic institutes but now we are updated with recent knowledge and are more confident and motivated to learn more".

Disadvantages of the exam:
All the physicians stated that it requires full preparation especially for OSCE exam as its main component is communication skills with patient centered approach.

"It is costly, a preparatory course and workshop is required to pass this exam as it requires recent updated knowledge with communication skill as major part of OSCE exam."

Table 1: Sociodemographic characteristics of general practitioners

Characteristic	frequency(N)	percentage (%)
Age (Years)		
25-35	7	11
36-45	33	51
>45	25	38
Gender		
Male	18	28
Female	47	72
Years of Practice		
<5 years	18	28
5-15 years	19	29
>15 years	28	43
Current working post		
Physician practicing independently	51	78
Physician in Private institution	14	28
Received Structured Training		
Yes	19	29
No	46	71
Knowledge Score		
Adequate	45	69
Inadequate	20	31
Attending CME Sessions		
Yes	53	81
No	12	19
Frequency of attending CME		
Weekly	30	46
Monthly	22	34
Quarterly	13	20
Source of Information for MRCGP examination		
Friends	42	65
CME	15	23
Seminars/Workshops	8	23

Figure 1: Reasons for taking MRCGP examination among GPs/FPS in Karachi-Pakistan

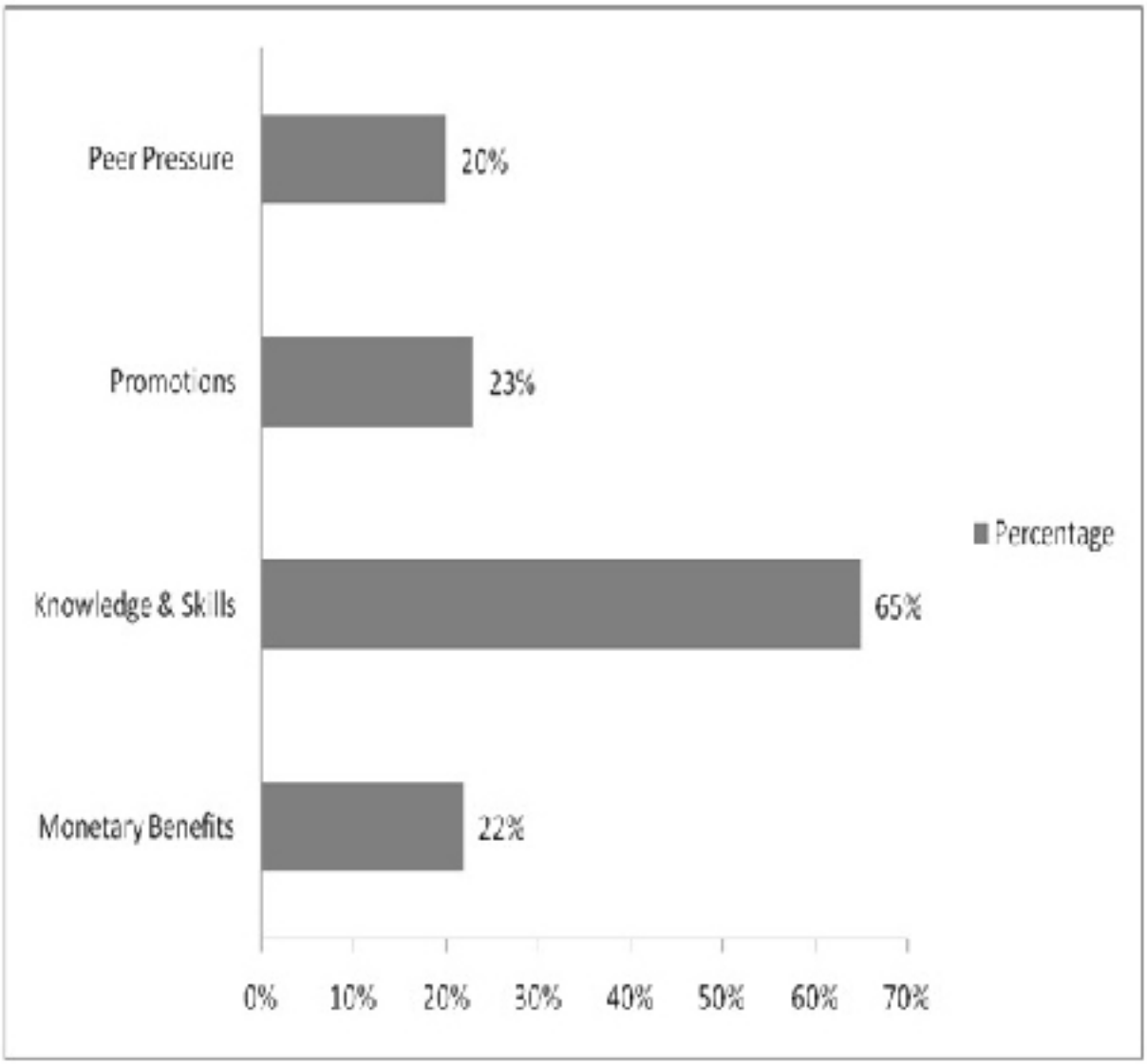
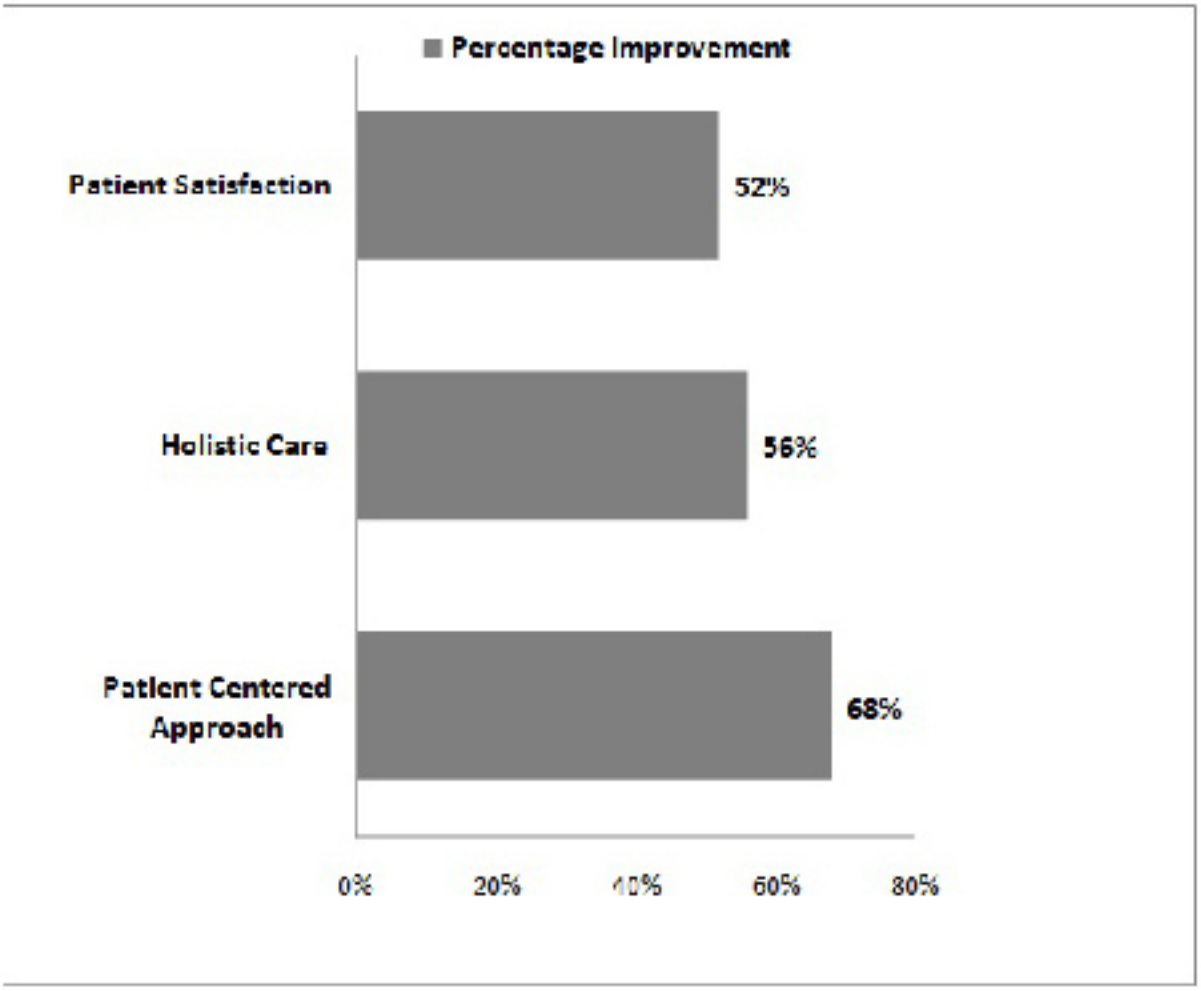
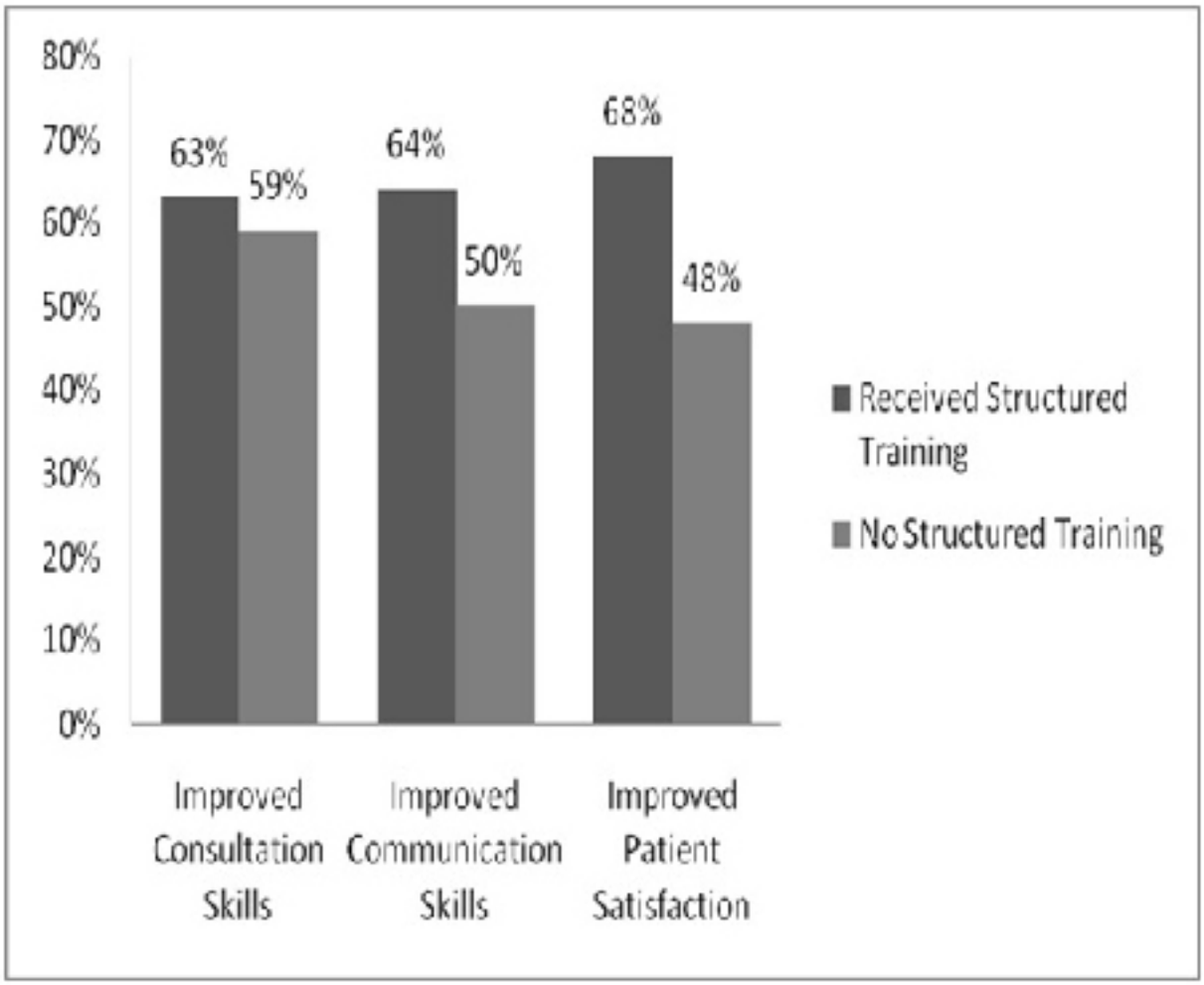


Figure 2: Major areas of strength of GPs/FPs consultation style as perceived by their patients



Multiple response question sum cannot be 100%

Figure 3: Perception of GPs/FPs regarding Impact of MRCGP [INT] exam on their clinical skills



Multiple response question sum cannot be 100%

Discussion

Summary of main findings:
Recent advancement in the field of medicine drives the need for the FPs/GPs to keep their knowledge up-to date. The results of this study as analyzed through focus group discussion and quantitative research reveals that CME sessions and workshops play a significant role in improving the consultation skills of the doctors and is a possible reason for the change in their clinical practice.

Strengths and Limitations:
Firstly, to the best of the author's knowledge this is the first epidemiological study conducted to see the impact of MRCGP [INT] examination on FPs/GPs knowledge and practice in Pakistan. Secondly, focus group discussions were also conducted in addition to the quantitative section so as to give voice to doctor's perceptions regarding impact of MRCGP [INT]. There was no drop out among the study participants. (Doctors, patients)

The study also has some limitations: the study suffered difficulties in the recruitment of FPs/GPs and their patients, due to clinic timings, and some of the doctors were reluctant to be scrutinized for their patient handling. Through the results of this study, we cannot truly measure the change in the doctors' knowledge and practice skills as we do not have data on their baseline knowledge and patient satisfaction level before they begin to prepare for the examination. Moreover, this is a cross sectional study so it is inappropriate to draw causal inferences that the change in knowledge and skills is solely due to MRCGP [INT]. Next, we measured the performance of FPs/GPs through patient's level of satisfaction; this can also bias the results as patients who have been visiting a specific FP for a long time, generally will have a better satisfaction as compared to others.

Comparison with existing Literature:
This study's results are consistent with other studies conducted which suggests that physician's knowledge declines after graduation(10-11). However, a majority of the study participants in this study also responded that the major reason to sit for the MRCGP [INT] examination was to enhance their knowledge and skills.

There is general consensus on the significance of CME on refreshing the technical skills and scientific knowledge of the FP (12 ,13). However, some studies oppose this explanation, indicating that a single event cannot bring a change in clinical practice until and unless it is interactive and a need based approach used (14). A major reason for high attendance in CME sessions in our study results can

be because of the fact that CME's are an integral part of the preparatory course of MRCGP. Studies suggest that training through a workshop using constructive feedback has improved communication and consultation skills among general practitioners (15,16,17).

Good communication skills are essential to establish a doctor-patient relationship (18,19). It has been evident from past studies that communication skills of doctors have a significant impact on patient satisfaction, medical outcomes, and thus on medical costs (19-22), however unfortunately communication skills is not given so much importance and has not been explicitly taught in undergraduate students therefore there is a dire need for a well-designed communications skills training programs to improve patient satisfaction with family practitioners (23, 24). The current study results are parallel with another study that suggested, MRCGP [INT] had a positive impact on the communication skills of the FPs/GPs(25). Likewise, in this study 68% of the patients reported that they had observed an improvement in their GPs/FPs consultation style, they are more empathic towards them and involve the patient more frequently as evident from Figure 3.

The GPs generally do not go through any special, structured training programme, however, by appearing and clearing this exam GPs have very well identified their learning needs they were previously unaware of and are now skilled to expand and apply their factual knowledge (26).

Implication for future research and clinical practice: Postgraduate examinations are widely used internationally as markers of excellence, but if they are to have any meaning, then relationships between exam performance and actual clinical practice should be demonstrated. In addition, comparison studies with doctors who do not sit for the examination is warranted.
Increased patient awareness due to media and internet has challenged health professionals, to not only increase their knowledge base, but also to practice it routinely. Hence, professional examinations such as MRCGP [INT] can be a reliable way for the FPs/GPs to update their knowledge for both who received structured training and those who did not. Refresher training programmes are essential for the continuous improvement in the doctors' knowledge and skills.

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Male and female interns in postgraduate medical education, A comparative gender analysis of differences in career perspective and their conditions in, Abha, Saudi Arabia

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Abstract

Background: Although considerable gains have been made in reducing the gender gap in education and labour market outcomes, it has yet to completely disappear. The gender difference in job assignment within the firm, however, may reflect differences in career tracks or training provided through job assignment. Differences in specialty choice are not solely related to gender and working hours, and motives for specialty choice may differ according to specialty.

Methodology: A descriptive cross-sectional study was conducted targeting all medical interns in all accessible hospitals in Abha city during the period from October 2020 to January 2021. All accessible interns were invited to participate in the survey. The questionnaire was initiated by the researcher after intensive literature review and expert's consultation. The questionnaire covered the interns' socio-demographic data, work-related data and preferred speciality besides preferred workplace and worktime. The last section included occupational self-efficiency expectations.

Results: The study included 80 medical interns of whom there were 30 males and 50 females. As for marital status, 73.3% of the male interns were married compared to 24% of the females with statistical significance (P=.001). Exactly 45.5% of married males had children compared to 85.7% of females (P=.016). The most preferred career choice by male interns was being Senior physician in a hospital (66.7%), and Faculty staff for teaching (66.7%). Among female interns, the most reported preferred workplaces were hospital work in total (72%), Faculty staff for teaching (52%), and Consultant physician in hospital (48%). High occupational self-efficacy was detected among 46.7% of the male interns versus 32% of females (P=.006).

Conclusions: In conclusion, the current study revealed that there were gender differences regarding future workplace (especially high responsibility positions) and work time specifically for those who had children, especially for female interns. Besides, males showed bimodal occupational self-efficiency expectations while female interns were at moderate level.

Key words: Gender differences, Career, workplace, worktime, occupational self-efficiency, postgraduate

Introduction

Recently, gender has lost its effect as a significant social and distinguishing social normsand egalitarian qualities have spread and an expanding number of women are working. The vertical isolation inside associations remains. Driving positions are more frequently held by men though women rather take a shot at lower hierarchical levels [1]. This additionally applies to the restorative segment: as of late, the level of female doctors has expanded fundamentally in practically all OECD nations. In Germany, around 66% of medical graduate are females. [2] Notwithstanding, ladies still face more prominent difficulties regarding their expert professions. The expansion in female doctors is yet not spoken to in all hierarchical positions only 10% of leadership positions in the medical field in Germany are currently held by women [3, 4].

Male differs from a female in planning to the future; several studied mentioned that there is the difference in more aspects, for example, standard working hours, consistency, and space for private life are increasingly critical for women when choosing a speciality to fame and a workplace than for their male partners [5, 6]. Moreover, ladies still have serious issues accommodating work and family life [7-11]. There is an expanding hole between the interest for medicinal experts and those searching for work. This escalates the continuous talk about the effect of patterns like 'feminisation' and 'Generation Y' on the restorative work showcase. The great extent of female doctors causes new difficulties in therapeutic consideration, particularly in emergency clinics [4]. The current study aimed to assess the difference between male and female residents in the career differences of in their postgraduate medical education in Saudi Arabia. Also, to determine the position preferences of male and female physicians in the hospital and in how far occupational self-efficacy corresponds to the interest in a hospital leading position.

Methods

A descriptive cross-sectional study will be conducted targeting all medical interns in all accessible hospitals in Abha city, capital of Aseer province, Southern Saudi Arabia. The study was conducted during the period from October 2020 to January 2021. The interns were selected based on their availability in groups at a single site. All accessible interns were invited to participate in the survey. Response rate was 68% among all invited interns. After obtaining permission from Institutional ethics committee, data were collected from the interns using pre-structured online questionnaire. The questionnaire initiated by the researcher after intensive literature review and expert's consultation. The questionnaire covered the interns' socio-demographic data, work-related data, and preferred speciality. Preferences regarding the preferred workplace and position were collected by asking about which professional position would intern like to reach after finishing your postgraduate medical training. Also, medical interns were asked about their preferred working hours after finishing their residency. Last section of the questionnaire covered residents' occupational self-efficacy expectation. This scale was validated in connection with the longitudinal study [12]. It consists of six items where interviewees are supposed to specify their degree of agreement on a 5-level scale that ranges from 1 "strongly disagree" to 5 "strongly agree". The ratings were then summarised to form a total score. Therefore, the OSEE-scale ranges between values of 5 and 30.

Data analysis

After data were extracted, it was revised, coded and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. Discrete scores for occupational self-efficacy expectation scale were summed and the overall score categorized into interns with low occupational self-efficacy (scored 5-13), moderate occupational self-efficacy (scored 14, 22), and occupational self-efficacy (scored 23-30). Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, work related data, preferred speciality, preferred future workplace and position, and preferred working hours after finishing their residency by interns' gender. Pearson chi-square and exact probability tests were used for testing significance.

Results

The study included 80 medical interns of which 30 males and 50 females. As for marital status, 73.3% of the male interns were married compared to 24% of the females with statiscal significance (P=.001). Exact of 45.5% of married males had children compared to 85.7% of females (P=.016). As for internship duration, 93.3% of male interns spent 10-12 months compared to 76% of females (P=.051). Exact of 66.7% of male interns exposed to faculty awareness courses about postgraduate programs versus 36% of females. Also, 80% of male interns exposed to SCHS awareness courses about residency programs compared to 28% of females (P=.001). Selecting the future speciality was reported by 80% of male interns in comparison to 68% of females (P=.245). The most preferred specialities among male interns were family medicine (36.7%) followed by surgery (26.7%), and medicine (20%) while the most preferred by females were family medicine (54%) followed by other specialities (paediatrics, dermatology, and radiology) with recorded statistical significance (P=.005). Exact of 73.3% of male interns decided about future speciality during internship compared to 72% of females (Table 1).

Table 2 shows preferred future workplace and position after medical board certification by medical interns' gender. The most preferred by male interns was being Senior physician in hospital (66.7%), Faculty staff for teaching (66.7%), hospital work in total (60%), and Other career objectives (60%) while 46.7% did not decide regarding this item. Among female interns, the most reported preferred

workplaces were Hospital work in total (72%), Faculty staff for teaching (52%), Consultant physician in hospital (48%), and Senior physician in hospital (40%) while 36% have no final decision.

Considering preferred work time model after medical board certification by gender and parental status (table 3), exact of 60% of male residents with children preferred part-time work throughout their career compared to 66.7% of females while full time work was preferred by 20% of male interns with children compared to 16.7% of females (P=.247). As for those with no children or not married, 60% of male interns preferred full-time work throughout their entire career versus 10.5% of females where 42.1% of them preferred few years of full-time work followed by part-time work compared to 20% of males with recorded statistical significance (P=.001).

Table 4 illustrates distribution of interns' occupational self-efficacy expectations items by their gender. Exact of 53.3% of male interns agreed on being very confident that I could deal efficiently with the challenges of their work if they wanted to compare to 36% of females with recorded statistical significance (P=.014). Also, 46.7% of male interns agreed on that they know that being sufficiently interested in all requirement of their work in comparison to 32% of females. Exact of 56% of female interns know that they have the skills necessary for my work in comparison to 46.7% of males (P=.001). The ability of achieving professional aims and gaols was confirmed by 53.3% of male interns versus 28% of females (P=.008). Also, 33.3% of male interns were confident that they were motivated enough to deal with serious difficulties at work compared to 16% of females (P=.002). Totally, high occupational self-efficacy was detected among 46.7% of the male interns versus 32% of females (P=.006).

Discussion

The current study aimed to assess the difference between male and female residents in the career differences of in their postgraduate medical education in Saudi Arabia. Also, to determine the position preferences of male and female physicians in the hospital and in how far occupational self-efficacy corresponds to the interest in a hospital leading position. The future career preferences of postgraduate interns are crucial to the keep of an adequate supply of medical staff and the future delivery of health care to the population. Some specialties are chosen less frequently, and interest in these specialties is not high especially among females, it may be helpful to explore the motives and intentions for future career, workplace, and work time agenda [13, 14].

The current study revealed that marital status was significantly higher among male interns than females but having children was more among married female interns which means more responsibilities among female interns and many familiar considerations regarding the future career and work times which should be suitable for family with children. Besides, an interesting finding which raise many questions about the university and SCHS role in explaining future careers and job specifications for each specialty was very defective among female interns who the main risky group for speciality preference in contrast to male interns are where more than three quarters of them talked about that role. That explains the next finding of that majority of female interns are interested about family medicine speciality which is somewhat calm speciality with no emergency and no midnight calls. In contrast to male interns who preferred family medicine but at a lower portion (nearly 1:2) but also surgery was under their future interest.

As for preferred future workplace and position after medical board certification, there was a significant difference between male and female interns for some but not all positions. Being senior physician in hospitals was more preferred by male interns than females as that position means to spend more time within the hospital, unsuitable for females who had husband and children. Also, male interns showed higher intention to work in ambulatory care than females (3:1). Hospital work in total was more preferred by female interns than males but also higher portion of male interns preferred being specialist in hospital without leading responsibility. One of the interesting findings was that male and female interns' interest for being university staff for teaching which should be considered and improved to have a role in future medicine life in the kingdom.

Regarding preferred work time model after medical board certification, having children is considered as confounding variable where majority of both male and female interns who were married and had children preferred part-time work throughout my entire career with no significant difference. The motive may be different, but the final decision is not different. In more explanation, male interns preferred parttime may be due to their planning for private work, but females, children and family duties may be the motive. The situation is different among those who did not have children as majority of male interns preferred full-time work throughout my entire career (two thirds) while nearly half of the females preferred few years of full-time work followed by part-time work.

All these findings were nearly consistent with a study conducted in Germany by All these findings were nearly consistent with what was reported by Ziegler S et al [15] who found that male and female physicians didn't report the same preferred workplace. Authors found that female physicians prefer part-time work and rarely assume leading positions compared to male physicians. Female physicians with children are loaded and underprivileged more often than their female colleagues without children as well as male physicians in general. There are other many studies which assessed impacts on career planning have confirmed gender differences. Females tend to prefer fields with intensive patient contact, whereas men tend to prefer instrument-oriented and high-technology medicine. In Switzerland, about half of were females but preferred to work fewer hours per week and have part-time jobs more often than men do. [16] Consequently, working hours as

Table 1. Personal and career data of interns in postgraduate medical education by gender, Abha, Saudi Arabia

Personal and career data	Total		Gender				P-value
			Male (n=30)		Female (n=50)		
	No	%	No	%	No	%	
Age in years							
20-25	16	20.0%	6	20.0%	10	20.0%	.229
26-29	50	62.5%	16	53.3%	34	68.0%	
30+	14	17.5%	8	26.7%	6	12.0%	
Marital status							
Single	44	55.0%	8	26.7%	36	72.0%	.001*
Married	34	42.5%	22	73.3%	12	24.0%	
Divorced / widow	2	2.5%	0	0.0%	2	4.0%	
Have children							
Yes	22	61.1%	10	45.5%	12	85.7%	.016*
No	14	38.9%	12	54.5%	2	14.3%	
Internship duration (months)							
6-9	14	17.5%	2	6.7%	12	24.0%	.051
10-12	66	82.5%	28	93.3%	38	76.0%	
Did you expose to any faculty awareness courses about postgraduate programs?							
Yes	38	47.5%	20	66.7%	18	36.0%	.008*
No	42	52.5%	10	33.3%	32	64.0%	
Did you expose to any SCHS awareness courses about residency programs?							
Yes	38	47.5%	24	80.0%	14	28.0%	.001*
No	42	52.5%	6	20.0%	36	72.0%	
Did you choose your specialty of interest?							
Yes	58	72.5%	24	80.0%	34	68.0%	.245
No	22	27.5%	6	20.0%	16	32.0%	
Your first specialty of interest							
Family medicine	38	47.5%	11	36.7%	27	54.0%	
Medicine	6	7.5%	6	20.0%	0	0.0%	
O /G	2	2.5%	0	0.0%	2	4.0%	.005*
Fine surgery	2	2.5%	0	0.0%	2	4.0%	
Surgery	14	17.5%	8	26.7%	6	12.0%	
Others	18	22.5%	5	16.7%	13	26.0%	
When did you decide to choose specialty?							
During clinical years	22	27.5%	8	26.7%	14	28.0%	.897
During an Internship	58	72.5%	22	73.3%	36	72.0%	

P: Exact probability test
* P < 0.05 (significant)

Table 2. Preferred future workplace and position after medical board certification by medical interns' gender

Preferred future workplace and position after medical board certification	Total		Gender				P-value
			Male (n=30)		Female (n=50)		
	No	%	No	%	No	%	
Hospital work in total	54	67.5%	18	60.0%	36	72.0%	.267
Administrative position within hospital	30	37.5%	14	46.7%	16	32.0%	.190
Specialist in hospital without leading responsibility	34	42.5%	16	53.3%	18	36.0%	.129
Senior physician in hospital	40	50.0%	20	66.7%	20	40.0%	.021*
Consultant physician in hospital	38	47.5%	14	46.7%	24	48.0%	.908
Work in ambulatory care in total	22	27.5%	14	46.7%	8	16.0%	.003*
Establish a private practice	30	37.5%	14	46.7%	16	32.0%	.190
Employment in private practice or ambulatory health centre	36	45.0%	16	53.3%	20	40.0%	.246
Faculty staff for teaching	46	57.5%	20	66.7%	26	52.0%	.199
Other career objectives	30	37.5%	18	60.0%	12	24.0%	.001*
No concrete idea	32	40.0%	14	46.7%	18	36.0%	.346

P: Pearson X2 test
* P < 0.05 (significant)

Table 3. Preferred work time model after medical board certification by gender and parental status

Preferred work-time model after medical board certification	Have children							
	Yes				No			
	Male		Female		Male		Female	
	No	%	No	%	No	%	No	%
Full-time work throughout my entire career	2	20.0%	2	16.7%	12	60.0%	4	10.5%
Part-time work throughout my entire career	6	60.0%	8	66.7%	4	20.0%	14	36.8%
Few years of full-time work followed by part-time work	2	20.0%	0	0.0%	4	20.0%	16	42.1%
No work time model detected	0	0.0%	2	16.7%	0	0.0%	4	10.5%
P-value	.247				.001*			

P: Exact probability test
* P < 0.05 (significant)

Table 4. Distribution of interns' Occupational self-efficacy expectations items by their gender

Occupational self-efficacy expectations items	Total		Gender				P-value
			Male		Female		
	No	%	No	%	No	%	
I am very confident that I could deal efficiently with the challenges of my work if I wanted to							
Disagree	26	32.5%	12	40.0%	14	28.0%	.014*
Neutral	20	25.0%	2	6.7%	18	36.0%	
Agree	34	42.5%	16	53.3%	18	36.0%	
I know that I have the skills necessary for my work							
Disagree	26	32.5%	16	53.3%	10	20.0%	.001*
Neutral	12	15.0%	0	0.0%	12	24.0%	
Agree	42	52.5%	14	46.7%	28	56.0%	
I know that I am sufficiently interested in all requirement of my work							
Disagree	20	25.0%	10	33.3%	10	20.0%	.298
Neutral	16	20.0%	4	13.3%	12	24.0%	
Agree	44	55.0%	16	53.3%	28	56.0%	
I feel able to handle challenges at work because I am confident in my abilities							
Disagree	26	32.5%	14	46.7%	12	24.0%	.002*
Neutral	24	30.0%	2	6.7%	22	44.0%	
Agree	30	37.5%	14	46.7%	16	32.0%	
I have no problems achieving my professional aims and gaols							
Disagree	30	37.5%	12	40.0%	18	36.0%	.008*
Neutral	20	25.0%	2	6.7%	18	36.0%	
Agree	30	37.5%	16	53.3%	14	28.0%	
I am confident that I am motivated enough to deal with serious difficulties at work							
Disagree	32	40.0%	16	53.3%	16	32.0%	.002*
Neutral	30	37.5%	4	13.3%	26	52.0%	
Agree	18	22.5%	10	33.3%	8	16.0%	
Occupational self-efficacy expectations level							
Low (5-13)	22	27.5%	12	40.0%	10	20.0%	.006*
Moderate (14-22)	28	35.0%	4	13.3%	24	48.0%	
High (23-30)	30	37.5%	14	46.7%	16	32.0%	

P: Pearson X2 test
* P < 0.05 (significant)

a factor in career choice has become more important as female physicians wish to balance work and family duties [17, 18]. But working hours are now coming to represent a more important factor for men too [19, 20].

As for Occupational self-efficacy expectations (OSSE), the current study showed that male interns had significantly higher occupational self-efficacy than females but also males showed higher level of low self-efficacy, but female intern were at the moderate level. That difference at OSEE is affected intern's readiness to accept leading duties. When comparing female physicians with a high OSEE score to males with a similar score, no differences about the readiness to take over leadership positions.

Conclusions and Recommendations

In conclusion, the current study revealed that there were gender differences regarding future workplace (especially high responsibility positions) and work time specifically for those who had children especially for female interns. Besides, males showed bimodal occupational self-efficiency expectations where they were either at low or high grades while female interns were at moderate level. Precise measures should be applied or, if already existing, improved to improve the occupational self-efficacy expectation of female physicians and, enhance their willingness to work in leading positions. Besides, more effort should be paid to clarify future careers and their challenges to help interns correctly put their feet on the ground according to their environmental and familiar responsibilities.

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An unusual case of new onset unilateral headache with nausea following a fall

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Abstract

Headaches are a common presentation in family medicine. A detailed history including which medications the patient is taking, needs to be taken into account when formulating the list of differential diagnoses. As a Family Physician it is vital to remain analytic and mindful of the red flag symptoms. Obesity and the use of Combined Oral Contraceptive pills (COCP) can be contributory factors for a headache such as Idiopathic Intracranial Hypertension (increased pressure within the skull) and Migraine. In the case below, we discuss how these two risks factors led to a thrombosis picture, which initially presented as a unilateral headache. It highlights the importance of considering the multifactorial nature of General Practice and the need for the clinician to practice holistically and consider the patient as a whole.

Key words: headache, nausea, COCP

Case History

A 34-year-old lady presented to the practice with a one-day history of vertigo, and nausea. This caused her to fall and she had hit the left side of her head. She also described a headache on the side where she had landed, and had not taken any analgesia. On examination, she was tachycardic to 100 beats per minute, normotensive with a blood pressure of 110/70 mm Hg. There were no signs of focal neurology but she seemed to be in some distress. A Hallpike test was done and this was positive to the left. A past medical history revealed she was fit and well but she had flare ups of benign positional paroxysmal vertigo. Her drug history consisted of Microgynon 30 once daily (combined oral contraceptive pill) and an antihistamine Proclorperazine for the vertigo. She was a non-smoker and drank minimal alcohol. Her Body Mass Index (BMI) was 36 kg/m^2. The GP advised her to go to the Emergency Department to rule out a possible subdural but patient declined this and wanted to go home. After a few hours, she started to vomit and complained of worsening left sided headache and started to hold onto her head. She went straight to the Emergency Department. On arrival her observations were stable and Migraine headache was considered as the most likely cause of her symptoms. During her stay at the Emergency Department, the headache worsened so a Computer Tomography (CT) scan was carried out. This revealed a sinus venous thrombosis. A Magnetic Resonance Venogram was recommended and showed thrombosis of the left transverse and sigmoid sinus. Cerebral Venous Thrombosis (CVT) is an uncommon disorder. However it has higher tendencies to occur in female patients younger than 40 years of age, smokers and or those with thrombophilia. Women who are pregnant and those who are taking hormonal contraceptive therapy are at risk (Fayaz, 2012) and in this case her BMI also needs to be taken into account as a confounding factor.

Discussion

The case has highlighted the medical complexities associated in patient presentations and the diagnostic conundrum they create in Primary Care. It is crucial to consider the patient as a whole and take the time to explore the background with a detailed system review and medication history. This case presents learning related to more than one system involvement, which can occur simultaneously. Also it appreciates that one aspect can have a knock on effect on another. The reflections from the case highlight that the link between COCP and raised BMI was not captured early on. This led to increased risk of thrombophilia and the presentation of headache which was diagnosed as CVT. This discussion will cover the importance of capturing the links that form the basis of the development of the pathology. Headache, Contraception and Obesity are common areas that are explored on a daily basis in primary care and the discussion aims to take clinicians through the process of a patient review, bearing the presentation in mind. Headaches are a very common pain condition that will affect most people during their lives. The main symptom of a headache is a pain in the head or face. This can be described as throbbing, constant, sharp or dull. Patients often present with comorbidities when diagnosing headache. The NICE guidance on headaches (NICE, 2012) lists signs and symptoms that warrant a consideration of investigation, of which neurology, fevers, trauma, sudden onset and visual changes are features often considered in primary care. See Table 1 for a list of these.

Table 1: Red Flag Headache Presentations

- worsening headache with fever
- sudden-onset headache reaching maximum intensity within 5 minutes new-onset neurological deficit
- new-onset cognitive dysfunction
- change in personality
- impaired level of consciousness
- recent (typically within the past 3 months) head trauma
- headache triggered by cough, valsalva (trying to breathe out with nose and mouth blocked) or sneeze
- headache triggered by exercise
- orthostatic headache (headache that changes with posture)
- symptoms suggestive of giant cell arteritis (scalp tenderness, jaw pain, fatigue, double vision)
- symptoms and signs of acute narrow-angle glaucoma (eye pain, nausea and vomiting, blurred vision, halos around lights)
- a substantial change in the characteristics of their headache.

In Cerebral Venous Thrombosis, there is a raised intracranial pressure and the patient presents with early morning headaches, nausea, altered levels of consciousness, papilloedema (optic nerve at the back of the eye becomes swollen) and seizures. Diagnosis is made via clinical suspicion and confirmation is done on imaging with computed tomography venogram or magnetic resonance angiogram (Fayyaz, 2012). Worsening advice should include the signs and symptoms the patient must look out for, actions to take should they arise and a specified follow up. A headache diary is very useful in helping with diagnosis and understanding the impact it is having on the patient (NICE, 2012)

- to record the frequency, duration and severity of headaches
- to monitor the effectiveness of headache interventions
- as a basis for discussion with the person about their headache disorder and its impact

This is in guidance with the RCGP curriculum where GPs should manage 'risk effectively in consultations, safety netting appropriately' and also 'provide appropriate documentation for each patient contact' (RCGP 2019). In this case it is important to point out that this lady was taking the COCP. The increasing prevalence of obesity around the world is requiring all clinicians to reflect on patient management and outcomes. The safety and efficacy of a drug needs to be considered when managing a patient with obesity. Levels of obesity are continuing to rise globally (WHO, 2013). Obesity is increasing in women of reproductive age and it is critical that safe contraceptive measures are utilized to minimize the increasing risk of obesity and pregnancy related complications. It is vital for clinicians to appreciate the dynamics of safe prescribing of contraception in women with raised BMIs. As per the UKMEC (United Kingdom Medical Eligibility Criteria for Contraceptive Use), women who have obesity (BMI categories of ≥30–34 kg/m^2 and ≥35 kg/m^2) of any age, taking any oestrogen containing contraception (i.e. combined hormonal contraception (CHC), including combined oral contraception (COC) containing both ethinylestradiol (EE) and estradiol, patch and ring) are categorised as UKMEC 2 or 3, depending on BMI. They are in these categorizations primarily because of the increased risk of Venous Thrombosis Embolism (VTE). (FRSH, 2016) As per the UKMEC (FSRH, 2019) it is crucial that women with obesity are informed of the risks associated with CHC:

► risk of thrombosis increases with increasing BMI.
► current CHC use is associated with increased risk of VTE.
► current CHC use is associated with a small increased risk of MI and ischaemic stroke.
► if BMI is ≥35 kg/m^2 the risks associated with use of CHC generally outweigh the benefits.

These UKMEC 2 and 3 classifications, indicate safety concerns for obese women using CHC and are related to cardiovascular risks from exogenous oestrogen, including VTE, acute Myocardial Infarction (MI) and stroke. They are based primarily on evidence that obesity and CHC are both independent risk factors for thrombosis (Murphy, 2010). This is a significant learning and key point. The base line risk of VTE is two fold greater with increasing BMI compared to normal BMI (Wattanakitt et al., 2012). It highlights that in this case the headache presentation and the rare diagnosis of cerebral thrombosis was confounded by two independent risk factors for thrombosis that were in play simultaneously. The significance of the learning here is the importance of clear history taking and documentation. Contraception in the Middle East is available over the counter and at times patients do not feel it is appropriate to declare as medication that they are taking as some may not consider it to be therapy. The case appreciates the multifactorial nature of primary care and the need to keep all hats on during a consultation. This is what sets Family Medicine aside from other disciplines; the ability to appreciate a patient as a whole story rather than chapters.

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A personal and professional retrospective of an exemplary family doctor who works at the very heart of his profession and his community

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Introduction

This retrospective highlights the activities of an exemplary family doctor, Dr Manzoor Butt from Rawalpindi, Pakistan, whose life's work extends far beyond the confines of his clinic and out into the community where he has initiated many projects in the fields of public health, public safety and poverty appeasement in the local community. This work also operates on what could readily be seen as evidence based medicine for impoverished communities and is also based on sound scientific principles.

Background

Dr Butt was born in Rawalpindi, Pakistan in, 1960 and received all formal education from School to Medical degree within Rawalpindi.

Dr Butt's work, as a family doctor, and trainer and educator is both textbook and enlightened. Additional to his clinical work he has trained male and female health workers from many parts of Pakistan as well as Rescue workers, called Emergency First Responders.

He has committed his life to his patients and community often to the detriment of his own health and is currently recovering from an above the knee amputation and getting ready to resume his practice. Both authors have met and worked with Dr Butt in various ways and have been moved by his commitment to true family medicine and to his community and wish to showcase his work as both a model and an ideal.

Dr Butt's Maqbool Clinic, is in Shamsabad, an impoverished area of Pakistan.

Dr. Manzoor Butt has an exemplar practice in terms of what he has done and is doing in the context of his community. Quality must be context dependent. The waiting room has two areas, one for men and one for women which is important for the culture in this area. This is a very rare amenity for his patients. He has a tiny, very private, room with a table for doing gynaecological examinations – again a rarity. He has a computer in his practice, and he has high-speed internet access so he can get the latest information. And, he is very careful to avoid the incentives so available to less ethical physicians (kick-backs from laboratories as an example). He is very careful about sterility. (Hepatitis C is epidemic in Pakistan – mainly from the re-use of needles and unsafe injections). He sees about 60 to 100 patients a day and the average charge is less than $1.00. Many pay nothing and he gives them free medicine. He has one boy, perhaps 12 years old who helps some around the office – so that the money he gives him for school is not just a "gift".

But the most important part of his practice is what he does in his community. He pulls together community walks for traffic safety. He has organized formal teaching sessions for homeopathic physicians. (He doesn't think homeopathy does anything, but points out that they are out there in the community treating people so they should have some knowledge). He has organized community groups and teams of volunteers (some from well-to-do families) to address issues of clean water, sanitation, mosquito control, medical care for of the poor and education for women He has sponsored art contests to provide some income for women. Because of the lack of ambulance services, he has also organized a Rapid Response Team to deal with accidents and injuries in the community.

Many of the facilities most of us take for granted are not available in this area and medical students are seeing patients – patients with multiple problems including a very heavy load of psychological problems (many of these are displaced from the area near the Afghanistan border or the earthquake area). The patients generally do not have even a few Rupees for medicine. The students take up collections so they can buy some medicines, get needed tests and on occasion use their own cars (if they have one) to drive patients for needed treatment.

Right from the beginning of his career, Dr Butt had very strong intention to organize the primary health care system in his area and to make his clinic a model for others. Towards this end, he became involved with willing international people and organisations throughout his working life. Dr Christopher Rose, PhD, Ex. Executive Director, Action in International Medicine (AIM) , London, UK and Dr Barry H. Smith, MD, PhD, Director of Dreyfus Health Foundation (DHF) , New York, USA were early collaborators. The two organizations were jointly operating the renowned CCI-Programme.

Dr Rose visited Pakistan twice, in 1998 and 1999, at DR Butt's request. They identified the Top Ten Health Problems of Shamsabad List during the last visit. Women's health problems were on the top of the list. They decided to address these problems through the CCI-Approach, but this was not possible due to lack of funds and the collapse of AIM.

Dr Butt was left with three choices:
a) Continue searching for the funds from other sources
b) Quit the mission
c) Continue the mission with his own personal resources at a very small scale through my clinic.

The first two were not possible so he decided to act on the third option and hence started to follow the PSBH1 - approach in his clinic.

Before starting the work, it was necessary to have some insight into the prevalence and magnitude of the most pressing health problems of women living in Shamsabad. Therefore, all the women attending his clinic for any reason were questioned about their (women's) health problems for one month and the most pressing women's health problems were identified.

Later, some conclusions were drawn, from this data.

The main problems were:
1) Vaginal discharge
2) Unwanted pregnancies in married women
3) Breast Problems
4) Malnutrition
5) Menstrual disorders

Strangely, only a few indicated the lack of facilities for Antenatal care and problems caused by childbirth by traditional birth attendants who are uneducated and lack training. To make the list more real and practical, the problems were re-numbered as follows:

1) Lack of facilities for antenatal care and childbirth
2) Vaginal discharge
3) Unwanted pregnancies in married women
4) Breast Problems
5) Malnutrition
6) Menstrual disorders

The women's health problems were discussed during different workshops in Shamsabad which were attended by a cross section of the community and the following were identified as aggravating factors:

Lack of medical facilities,
Ignorance,
Lack of nutritional facilities,
Prevalent social environment,
Psychological factors,
Unemployment and Poverty

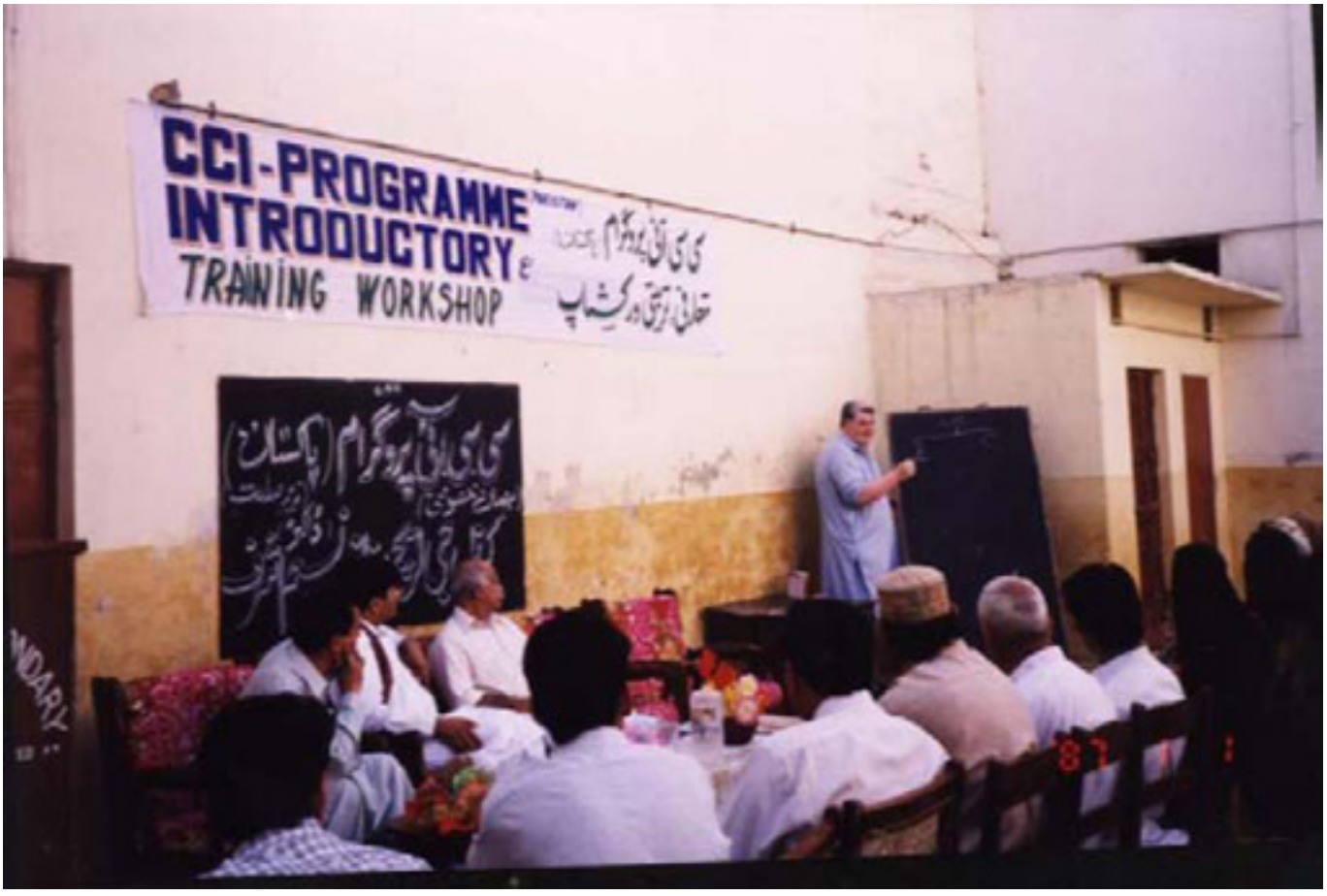
Mrs. Rahila Manzoor (Dr Butt's remarkable wife) is a locally trained health technician who can perform vaginal examination and take HVS and Pap smears. She plays a vital role in this work. The clinic always has at least one nurse capable of dealing with women. It was decided that Mrs. Rahila would first examine the patients and if she found something they were followed up.

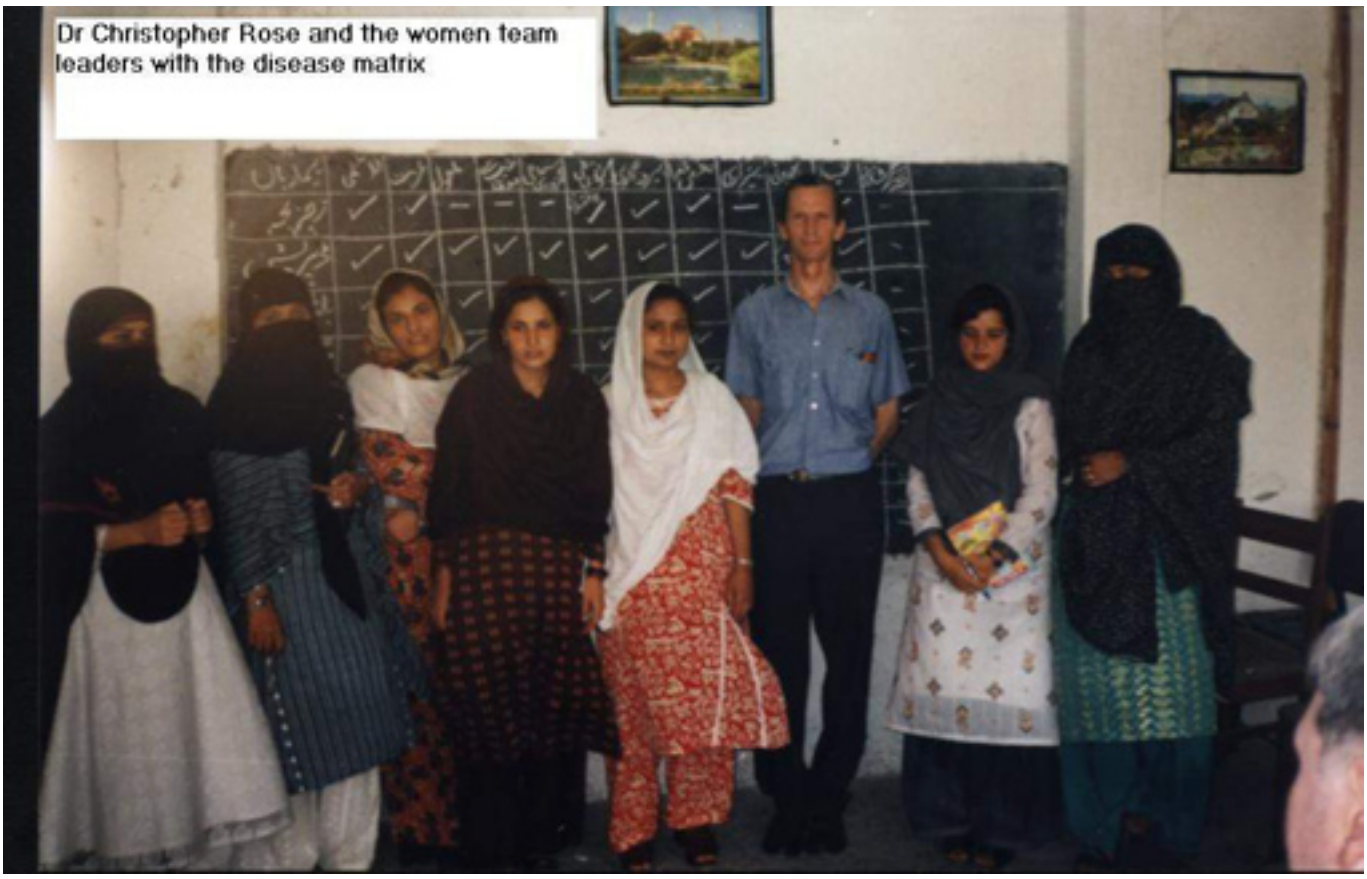
How the problems were overcome

First of all, Dr Butt established a help line (from 06 am to 01 am) which provided free advice and guidance for medical and social problems of patients. He is proud to inform us that he has saved lives of many innocent girls who were at the point of committing suicide because of their social circumstances. The clinic is also a social welfare office and available for everyone regardless of faith and religion. Dr Butt advises right from the start, I referred to patients as relatives, such as sister, daughter, and aunt so that they understood I do not have any evil intent. To overcome other difficulties, he undertook the following steps:

1) The examination room of the clinic permits complete privacy
2) During examination, his wife or a female nurse is always present
3) The Patient is allowed to bring in one of her relatives or friend into examination room during check-up, if she likes.
4) All information regarding a patient's examination and disease is kept fully confidential, even from the husband if the woman demands. If she is suffering from some serious problem, =she is encouraged to take her husband into confidence.

Training Women's Health workers





Dr Christopher Rose and the women team leaders with the disease matrix

Women group leaders are standing by the disease matrix of the area.They have acted as facilitators for its development

The activity was initiated formally in year 2000. All pregnant women attending the clinic were informed about the presence of Antenatal centres in the city and they were encouraged to visit such free government centres for antenatal booking and delivery. They were informed about the importance of:

(a) Diet during Pregnancy
(b) Regular Blood pressure check-ups
(c) Regular weight measurements
(d) Regular fundal height check-ups
(e) Hb % determination
(f) Blood /Urine Sugar determination
(g) Blood group determination
(h) Determination of foetal wellbeing through ultrasound examination
(i) Immunisation against Tetanus and Hepatitis

During 2001, this activity was performed with about 700 women. The outcome was greater than expected. Many women now come to the clinic for antenatal check-ups. Their number is at least five times more than those who were coming previously.

It was realized that the following activities are urgently needed to augment this effort:

a) More organised Antenatal check-up facilities including basic relevant tests at his clinic
b) More advocacies for ultrasound examinations and hospital delivery
c) The most important of all is the availability of resources for training of local midwives who are already popular among women. Requiring examination by a doctor, the patient would be given a choice to either have a pelvic examination in the clinic but if she refused a referral to hospital with a female doctor with a full personal reference from us. Dr Butt had already trained and upgraded his skills in obstetrics and gynaecology. The necessary skills were then taught to Mrs. Rahila. It was decided that expenses for the women's health project would be met from income of his clinic's other routine activities and all income from this project would be utilized to add facilities for enhancement of the activities.

There was no pathology laboratory nearby. There was a great need for a laboratory that could provide quality results at low price for his "Women's Health Project", especially those essential during antenatal period. He was already doing blood sugar testing, urine sugar testing and pregnancy tests in the clinic from his own resources; but there was an immense need to initiate the following very important tests: Blood grouping, Haemoglobin Estimation, ESR, urine screening for sugar and albuminuria, urine routine examination, screenings for Hepatitis-B, Hepatitis-C and HIV/AIDS.

Dr Butt used some savings from the clinic's income for this purpose. The money was used to buy the essentials. He has a part time laboratory technician and he refreshed his pathology knowledge and skills and undertook training in these tests. He has been performing these tests since 2002 and has kept the rates at a level which is affordable for all patients and does them free for the very poor. He uses Standard Control Technique to prevent false results. His patients have benefited not only via the affordable costs, but also get quality results without going very far. To keep it self sustainable, all income from the laboratory is being reinvested to buy the diagnostic reagents and material.

The main obstacle for providing such services
The main obstacle was that no-one could imagine that women would have an examination by a GP who is operating a clinic right near their homes. The following were identified as restraining factors:
* The concern as to how they could face this person again
* What if my husband finds out?
* The fear that someone may peep in during examination
* The fear that the staff of clinic would disclose this information to my neighbours/relatives.

Dr Butt advises - I respect every patient, especially women.

Working in the community

Dr Butt has initiated many community projects and some have already been mentioned. We would like to highlight a few.

Blind girl's school
An outstanding area of both Dr and Mrs Butt's work was with the Blind Girls school in Rawalpindi where some of the students had been abandoned and were at great risk on the streets and in some cases when found and brought to the school covered in lice. Initial work was to provide them with a safe clean place to live as so many students board at the school.

Medical focus was on practical lessons in hygiene and health, (including provision of proper toilets and bathroom at the school, and education on menstruation). The running of the school has now been taken on by the government and the status of the girls has risen from being marginalised and at risk – to now being called 'the angels'. The photos opposite show the girls receiving gifts for Eid.

Emergency assistance and Emergency Response
This chapter focuses on the aftermath of the Earthquake in the northern regions of Pakistan on October 8, 2005 and much of the following data comes from a paper by Lesley Pocock (1) with input from Professor John Beasley and Professor Qidwai of AKU Karachi Pakistan. In October 08, 2005 a major earthquake struck northern parts of the country, killing tens of thousands of people and injuring manifold more. Hundreds of thousands of residents lost their houses and were rendered homeless (1).

The region is under developed with lack of proper housing, roads and basic infrastructure including schools and hospitals. The people already live a very hard life with poor housing, lack of proper water supply and heating during severe winters.

Rawalpindi Blind Girl's school - celebrating Eid. Mrs Manzoor handing out gifts to the girls

Emergency Response after the 2005 earhquake

The earthquake struck one of the most vulnerable populations. The lack of food, water, warm blankets, clothes and shelter made life extremely hard for those who survived the natural disaster but lost close family members, neighbours and friends.

The medical issues were innumerable and rehabilitation of the injured the foremost tasks.

The lack of food and clean water supply facilitated spread of infectious diseases and gastroenteritis in particular. The exposure to severe cold with inadequate clothing and shelter will lead to frost bite and respiratory infections. A lot of people simply die due to exposure to cold.

The authors were intimately caught up in the disaster through existing relationships with family doctors in the region, and Emeritus Professor Beasley observed: "There are three phases to responding to a catastrophe such as that of the disaster of the Pakistan earthquake. (1) The first is the initial emergency response. Inevitably this was inadequate - No country, even one with wealth and a robust infrastructure, can cope well with an unexpected event on that scale. Witness, for example, the limitations of the response to hurricane Katrina in the US even though this was a far small disaster in terms of scope and lives lost. (Not only that, but it was one which was predictable -- at least for a matter of some days.) During this time the lives that are lost are due to the direct trauma and immediate effects of the earthquake.

The second phase is the response to the immediate aftermath which involves caring for the surviving injured, the hungry and those without shelter. In this phase more resources, governmental, international and local as well as international philanthropy are brought to bear. Interest and support for the response tends to be high and is heightened by a sense of continuing crisis. The lives that are lost are more due to hunger, disease and exposure in the weeks to a few months following the disaster.

The third phase is that of prolonged and sustained physical and social deprivation. New and continuing problems including general malnutrition, continued exposure, stress reactions and eventually the loss of such institutions as power, education, sanitation, public health systems, and medical care take their toll. Compounding the situation is the loss of the philanthropic and other support that is essential for the alleviation of the continuing suffering and the rebuilding of the physical and social infrastructure. Support dwindles as the event moves off the front pages (as it already has!) and new international situations erupt. Dr Tariq Aziz, ay the time General Secretary of the Pakistan Society of Family Physicians reported on the medical issues surrounding the relief and rescue effort: "Relief workers are experiencing severe depressive illness on their return to base camps and later to their homes. Now the Rehabilitation phase is on. Relief workers and people stranded in the area have severe logistic problems due to snowfall. Illnesses like pneumonia and gastro enteritis have also increased suddenly. Requirements of artificial limbs have suddenly become apparent. Some low cost material may be required, so that local manufactures can be encouraged to produce such on a mass scale. Besides big cities like Muzaffarabad (Capital of Azad Kashmir) all other towns and villages are located at variable height and distance, with difficult terrain in between and steep roads. Some cities and towns had really disappeared as the mountains separated and colonies or habitations caved in the big crevices formed, which almost closed in the end. Even dead bodies of thousands of people and buildings could not be traced as if they did not exist at all. The jolts of earthquake were so severe that within 2 minutes everything came to the ground or disappeared between mountains. Due to heavy landslides almost all roads disappeared. Total deaths exceeded 100 thousand and injured were about ten times of this."

Dr Manzoor Butt, travelled to the region and somehow got through. He sent these reports to international colleagues and they were outlined in an article called "Reaching the Unreachable (1).

" …All of you have watched the role of various organizations on TV. I have personally visited major affected areas with my team and I want to share the following observations with you.

1. The most tragic part of this disaster is the death of school children throughout the affected areas. In many schools, no one could be rescued. The main reason was poor quality of infrastructure in government buildings.
2. There was no Disaster Management Policy to follow and no Disaster Management Committee in Pakistan before this tragedy.
3. Lack of co-ordination between government, volunteers and NGOs was very evident
4. There was lack of initial interest and responsibility in most of government institutions- a large quantity of food and drugs are still at airports and there is no system to prevent their loss.
5. Most of people did not trust relief agencies [because of lack of transparency].They personally took relief essentials with them to affected areas. The result was an increase in transportation charges, roadblocks and repetition of efforts in many areas.
6. All aid went to areas where roads were accessible. The result was absolute absence of Rescue and Relief work in really damaged areas.
7. Absolute failure in rescue efforts - only one building got damaged in our capital city but we were totally unable to rescue the sufferers.

There was an urgent need for a Rapid Response Team in all communities. Towards this end, I have established "Shamsabad Rapid Response" with its headquarters at my clinic. I have temporarily suspended "Under -5 General Health Screening Project" and have initiated work on training of volunteers in Rapid Response.

The founder members of this team are staff at my clinic, my students and interested members from the immediate community. Medical aspects would be covered by me and the rescue work would be covered by Mr. Pervaiz Sheikh - who is a renowned civil defence trainer. He started this

work in 1958 and got First Gold Medal in Rawalpindi district in social work. He has worked during major disasters of Pakistan, namely 1965 & 1970 wars, many floods, Rawalpindi Bomb blast tragedy in 1988 and in this recent event.

And then regarding the journey itself Dr Butt sent the following report:
Day 1 - Camps are everywhere in the valley - it is difficult to reach these
Day 2 - A car of relief workers fell in the river.
Day 3 - Heavy landslides while we were passing through
Day 4 - A woman playing with her children outside of a camp
Day 5 - People crossing a river on a trolley
Day 6 - Base camp of Mules [army property] for areas where nothing else could go
Day 7 - Pakistan army at work.
Day 8 - Water Filtration plant set up by army. See the young "Lt. Faisal" of Pakistan army
Day 9 - Sabit Qadam Hospital at Sawan, set up by army
Day 10 - CHINNARI, once a busy town - now, one whole side of it has gone into river
Day 11 - Two mountains collapsed to block the river. Army had to blast the obstacles to give way to river again
Day 12 - Relief truck snatched by angry people in the dark of night.

Rocky Martial Arts Academy

Dr Butt works with many committed people from the area, both young and old. Dr Manzoor Butt contributed this article to the MEJB on Mr Zahid Bhatti, who operates the Rocky Martial Arts School in Rawalpindi, Pakistan.

Mr Zahid Bhatti, 23, is a highly distinguished Martial Arts Trainer who has a Black belt - Third Dawn (Black Belt 2nd Degree) in Muay Thai Kick Boxing.

He is a Martial Arts Master, Social Reformer, Human Rights Activist & Youth Worker at his own training facility the Rocky Kick Boxing Martial Arts Academy, which teaches approximately 150 students.

Among the students there are three girls, who are perhaps between 6 and 10 in the otherwise male class who range in ages from perhaps 10 to 20. Their mother, who has no husband and is very poor, was in despair – what to do with three girls and no husband? Mr Bhatti took them into the course so that they could get off the streets and perhaps have some opportunity to make something of themselves. No fee. No charge. Uniforms provided.

We feature some photos below of Mr Zahid Bhatti and students and further photos of one of the authors, Prof Beasley attending an awards session with Dr Butt.

Mr Zahid Bhatti

Using the internet

Community education continues via the internet. Dr Butt provides 'public/patient education in Urdu and English from his Facebook page and on You Tube.

YouTube :
https://youtube.com/c/DrManzoorAhmedButt
Facebook
https://facebook.com/drmanzoorbutt
Twitter
https://twitter.com/drmanzoorbutt

Conclusion

There are uncountable references we can make that show Dr Manzoor's endeavour and ingenuity in finding pragmatic ways to assist his community in both healthcare and life but none of this would have occurred without the most genuine and committed heart.

Dr Manzoor's community may be impoverished in financial terms but in terms of true humanity and human decency it must be one of the richest communities in the world.

References

(1) Lesley Pocock. REACHING THE UNREACHABLE. MEJB Volume 1, Issue 2

Eye rubbing: a survey of awareness of keratoconus and it's relation with eye rubbing in Jeddah

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Abstract

Background: Background: Previous Saudi studies have revealed poor public awareness about keratoconus (KC) and eye rubbing as the most common associated factor among KC patients.

Objectives: to assess the level of awareness and knowledge of keratoconus and its relation to eye rubbing in Saudi Arabia.

Methods: A cross-sectional study was done on 504 of the Saudi population. A pre-designed questionnaire was used to collect data about personal characteristics, knowledge about KC, practice of eye rubbing and the cause and history of atopic or eye diseases.

Results: 48.8% of the participants had heard about KC. The commonest source of information was reading and lectures, 21.4% reported correctly that KC is thinning of cornea and 32.9% and 50.4% reported correctly that KC is related to allergy and myopia respectively. Only 4.8% think that there was no treatment for KC, 75.8% were rubbing their eyes and for 40.9% the cause of rubbing was itching. Only 9.3% had a family history of KC and the levels of poor, fair and good knowledge about KC were 63.3%, 31.9% and 4.8% respectively. Participants who had previous knowledge about KC from their friends and relative, those who had KC, those from the northern region and those who had previously heard about Kc had a significant higher percentage of good knowledge.

Conclusion: The deficient awareness about KC revealed in this study calls for health education programs to raise the public awareness about this eye disorder.

Key words: eye, rubbing, awareness, survey, keratoconus, Jeddah

Introduction

Keratoconus (KC) is a Non-inflammatory ectatic ocular disease by which a progressive central corneal thinning process changes the cornea from normal dome-shaped into a cone-like protrusion (1). With genetic and environmental factors, KC aetiology is multifactorial and remains elusive (1). It is a corneal condition in which, in a cone-shaped manner, the central part of the cornea becomes thinner and bulges outward, resulting in myopia, irregular astigmatism, and ultimately visual impairment. (2,3).

Early in the disease, the patient is typically asymptomatic. As the disease progresses, visual acuity decreases and eventually the patient notices visual distortion with significant vision loss. These changes are due to the development of irregular astigmatism, myopia, and in many cases corneal scarring. In addition, the cornea becomes thinner (4,5). Most patients have bilateral keratoconus, although the progression and severity of the condition in each eye is usually asymmetric (6).

KC 's approximate prevalence is about 1.38 per 1000 population (7). The definitive keratoconus cause is undetermined, but eye rubbing was found to be a well-known risk factor (4). Studies have also shown that Asian (i.e., India 18,19) or Middle-Eastern keratoconus patients tend to be younger at diagnosis, and present with severe forms of the disease (8). Compared to Europe and North America, the higher prevalence of KC in warmer, sunny countries has led to the hypothesis that the high sun exposure in these countries accounts for the high prevalence (9).

It seems that environmental factors serve as a trigger for KC in genetically predisposed individuals. These environmental factors include eye rubbing, atopy and UV exposure (10). An association between eye rubbing and KC has long been described and accepted as a risk factor, and most studies reported that about half of KC patients rub their eyes (11,12,13). This was explained by the microtrauma caused to the epithelium by rubbing KC corneas that elevate levels of matrix metalloproteinases MMP-1 and MMP-13 (14), which are secreted by epithelial and stromal cells, and inflammatory mediators including IL-6 and TNF-□ (15). The release of these factors forms part of the process that leads to KC and its progression (15). Balasubramanian et al, 2013 performed a study to assess the influence of eye rubbing on protease expression, protease activity, and concentration of inflammatory molecules in tears, which are found to be relevant within the pathogenesis of keratoconus. The study revealed that eye rubbing for 60 seconds increased the extent of tear MMP-13, IL-6, and TNF-α in healthy study subjects (16). In 2014 Hashemi et al, performed a study to evaluate the prevalence of keratoconus and associated factors among one thousand and twenty-seven Iranian university students. In this study, keratoconus prevalence was 2.5%. This finding has not been highly connected with (male/female status) or age. However, the family history was strongly related to keratoconus (17). Recently, Mazharian et al. in 2020 conducted a case-control study that assessed the relationship between eye rubbing and sleeping position in patients with Unilateral or Highly Asymmetric Keratoconus (UHAKC). This study showed a strong evidence of the relationship between eye rubbing, wrong sleeping position, and UHAKC. They also indicate the need for public health consideration of the harmful effects of excessive eye rubbing and inappropriate sleeping position (4).

In the Kingdom of Saudi Arabia (KSA), a study was done by Assiri et al., in 2005 to explore the rate and severity of keratoconus. The study included 125 newly diagnosed patients with keratoconus. The study reported that 20 cases per 100,000, (44.8%) had a positive ocular history for eye rubbing, which is considered as one of the keratoconus risk factors (8). In 2012, a study from King Khaled Eye Specialist Hospital in Riyadh showed that the prevalence of keratoconus was 0.81/105 citizens (18). In 2016, Al-Shammari et al conducted a retrospective study in Hail region to find out the prevalence of KC and its presenting clinical features. This study showed that eye rubbing is the most common associated factor as among KC patients 44.8% had eye rubbing. The study concluded that a strong emphasis should be placed on preventive strategies such as setting up a family education program on common risks of KC (19). In 2018, a cross-sectional multicenter study was done to assess the prevalence of KC among Saudi pediatric patients (6–21 years) and reported it to be 4.79% (20).

Proper awareness of the population at risk of KC can lead to a better absorption of educational services by the community and eventually to the proper use of the available health care facilities (21,22). A careful literature search has found that only one study has been done in KSA to assess the awareness of KC. This study was done in 2020 in Abha city among non-medical students. The study found that among those who had poor awareness, the majority were female (95.7%) and belonged to the age group of 17–21 years (68.3%). More than half of the study participants have poor awareness and knowledge about the incidence, symptoms, and treatment modalities of KC. The study concluded that the level of awareness is considered a key factor for better utilization of eye health care (23). This result supports similar findings reported from urban community in Saudi Arabia that had significantly poor knowledge about specific eye diseases (24).

The aim of this study was to assess the level of awareness and knowledge of keratoconus and its relation to eye rubbing in Jeddah, Saudi Arabia.

Methods

Study design: a cross-sectional study was done.

Study setting: all residents of KSA.

Study Subjects: male and female residents of KSA.

Sampling Technique: Random sampling methodology was used using the equation of the established formula for calculation of sample size. Where N is the population size, E is the margin of error (5%), r is the fraction of responses, and Z(c/100) is the critical value for the confidence level c, the sample size n, and margin of error E

$x = Z(c/100)2r(100-r)$

$n = N\ x/((N-1)E2 + x)$

$E = Sqrt[(N - n)x/n(N-1)]$

Data Collection: A pre-designed self-administered questionnaire was used including all eligible participants. Internal consistency and reliability of the questionnaire was assessed by Cronbach's α test. The questionnaire included items on personal characteristics, knowledge about KC, practice of eye rubbing and the cause and history of atopic or eye diseases. The questionnaire included six questions that assessed participants' knowledge about KC. Every correct answer was given a score of (1) and for wrong answers a score of (0) was given leaving a total score of 6. Participants who got a score <50% of the total score were classified as having poor knowledge, those who got a 50-75% of the total score were classified as having fair knowledge and those who got >75% of the total score were classified as having good knowledge.

All questionnaire items were translated into the Arabic language by a health care physician and a translator expert fluent in both Arabic and English languages. The resulting Arabic questionnaire was then translated back into the English language by another two experts fluent in both languages. Those two experts were blinded to the questionnaire original English version. The back translated version of the questionnaire was compared with the original English one to check the translation quality which is the back-translation method recommended by the World Health Organization (WHO) (25,26).

Ethical Considerations: Ethical approval for the study was obtained from the research ethics committee of the ministry of health (MOH). An electronic consent was filed by all participants before participating in the study.

Data analysis: Data were analyzed using (SPSS) version 25. Qualitative data were presented as frequencies and percentages, and Chi-squared test ($\chi 2$) was used to assess the relationship between variables. Quantitative data was expressed as mean and standard deviation (Mean ± SD). A p-value of <0.05 was considered as statistically significant.

Results

Table 1 shows that 54.2% of the participants had an age ranging from 18-30 years, 77.6% were females, 54.8% were not married, 73.4% had a bachelor's degree of education, 35.9% had a monthly income of less than 3000 SR and 60.3% were from the Western region. About 53% (53.2%) had an underlying atopic disease, where skin atopy was the commonest (17.9%) followed by eye atopy (15.9%). Most of the participants (70.2%) had an underlying eye disease with Myope/hypermetropia as the commonest eye disorder (65.7%). Of the participants, 3.8% reported having KC.

Table 2 shows that 48.8% of the participants had previously heard about KC and the commonest source was reading and lectures (18.3%). Only 21.4% of the participants reported correctly that KC is thinning of the cornea. Of them, 32.9% and 50.4% reported correctly that Kc is related to allergy and myopia respectively. Only 4.8% think that there is no treatment is present for KC, 75.8% were rubbing their eyes and for most of them (40.9) the cause of rubbing was eye itching. About one third of the participants (34.3%) correctly reported that eye rubbing may lead to keratoconus.

Figure 1 illustrates that 9.3% of the participants had a family history of KC. The mean knowledge score was 1.94 ± 1.45 and the levels of poor, fair and good knowledge about KC among the participants were 63.3%, 31.9% and 4.8% respectively (Figure 2).

Table 3 shows that participants who had previous knowledge about KC from their friends and relatives and who had KC had a significant higher percentage of those who had good knowledge (p=<0.05). A non-significant relationship was found between participants' knowledge level about KC and their characteristics, having an underlying atopic or eye disease, family history of KC or eye rubbing (p= >0.05).

Figures 3 and 4 show that participants from the northern region and participants who had previously heard about KC had a significant higher percentage of those who had good knowledge (p=<0.05).

Table 1. Disruption of studied participants according to their characteristics and having an underlying atopic or eye disease (No.: 504)

Variable	No. (%)
Age/ years	
18-30	273 (54.2)
31-39	86 (17.1)
40-49	86 (17.1)
50-60	48 (9.5)
>60	11 (2.2)
Gender	
Female	391 (77.6)
Male	113 (22.4)
Marital status	
Not married	276 (54.8)
Married	228 (45.2)
Educational level	
Primary	9 (1.8
Intermediate	9 (1.8)
High school	113 (22.4)
Bachelor's degree	370 (73.4)
Not educated	3 (0.6)
Monthly income	
less than 3000 SR	181 (35.9)
3000-10000 SR	163 (32.3)
More than 100 00SR	160 (31.7)
Residence region	
Southern	56 (11.1)
Eastern	57 (11.3)
Western	304 (60.3)
Central	61 (12.1)
Northern	26 (5.2)
Do you have an underlying atopic disease?	
No	268 (53.2)
Yes	236 (46.8)
If yes, where is this atopic disease:	
Nose	9 (1.8)
Skin and eye	3 (0.6)
Chest	39 (7.7)
Eye and chest	3 (0.6)
Skin	90 (17.9)
GIT	12 (2.4)
Eye	80 (15.9)
Do you have underlying eye disease	
no	150 (29.8)
yes	354 (70.2)
If yes, what is this disease?	
KC	19 (3.8)
Dry eye	4 (0.8)
Myope/hypermetropia	331 (65.7)

Table 2. Disruption of studied participants according to their knowledge about KC and practice of eye rubbing (No.: 504)

Variable	No. (%)
Knowledge about keratoconus:	
Have you ever heard about KC?	
no	258 (51.2)
yes	246 (48.8)
If yes, how did you hear about KC?	
The doctor	43 (8.5)
Readings and lectures	92 (18.3)
Friends and relative	51 (10.1)
Internet and social media	60 (11.9)
In your opinion, what is KC?	
Corneal inflammations	73 (14.5)
Increase thickness of cornea	85 (16.9)
Don't know	232 (46)
Immunological diseases	6 (1.2)
Thinning of cornea (correct answer)	108 (21.4)
In your opinion, is KC related to allergy?	
No	48 (9.5)
I do not know	290 (57.5)
Yes (correct answer)	166 (32.9)
In your opinion, does KC lead to myopia?	
No	14 (2.8)
I do not know	236 (46.8)
Yes (correct answer)	254 (50.4)
In your opinion, how is KC treated?	
Glasses	27 (5.4)
Contact lens	26 (5.2)
Eye drops	27 (5.4)
Surgery	144 (28.6)
Don't know	256 (50.8)
No treatment present (correct answer)	24 (4.8)
Eye rubbing is classified as:	
One of the safe habits	33 (5.6)
Normal but if increased lead to allergy	1 (0.2)
Cause eye contamination	1 (0.2)
Causes corneal problems	4 (0.8)
Bad habit	7 (1.4)
May lead to keratoconus (correct answer)	173 (34.3)
I do not know	285 (56.5)
Practice of eye rubbing	
Do you rub your eyes?	
no	122 (24.2)
yes	387 (75.8)
If the answer of the previous question is yes, why do you rub your eye?	
stress or headache	102 (20.2)
allergy	69 (13.7)
itching	206 (40.9)
all of the above	5 (1)

Figure 1. Percentage distribution of the participants according to having a family history of KC

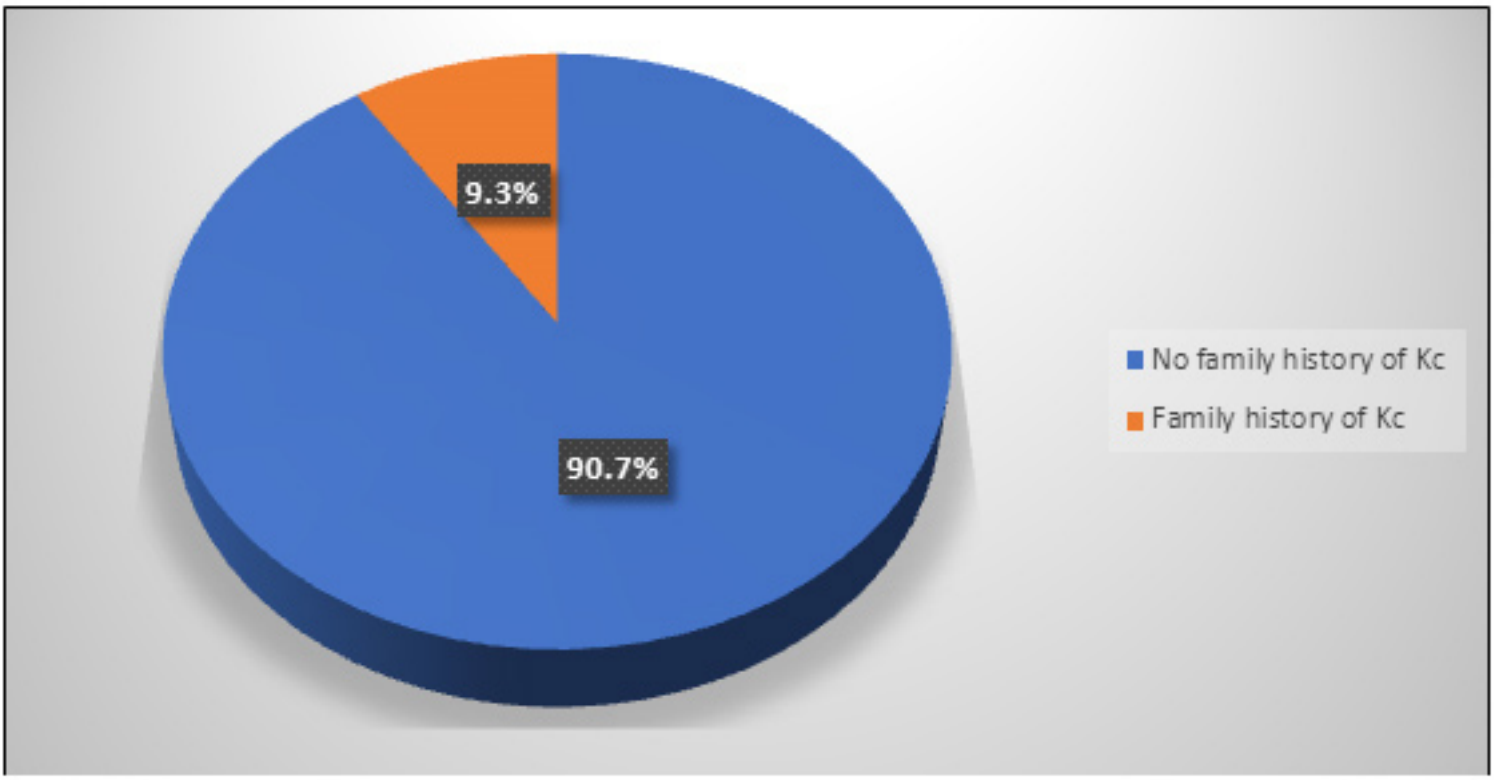


Figure 2. Percentage distribution of the participants according to their knowledge level about KC

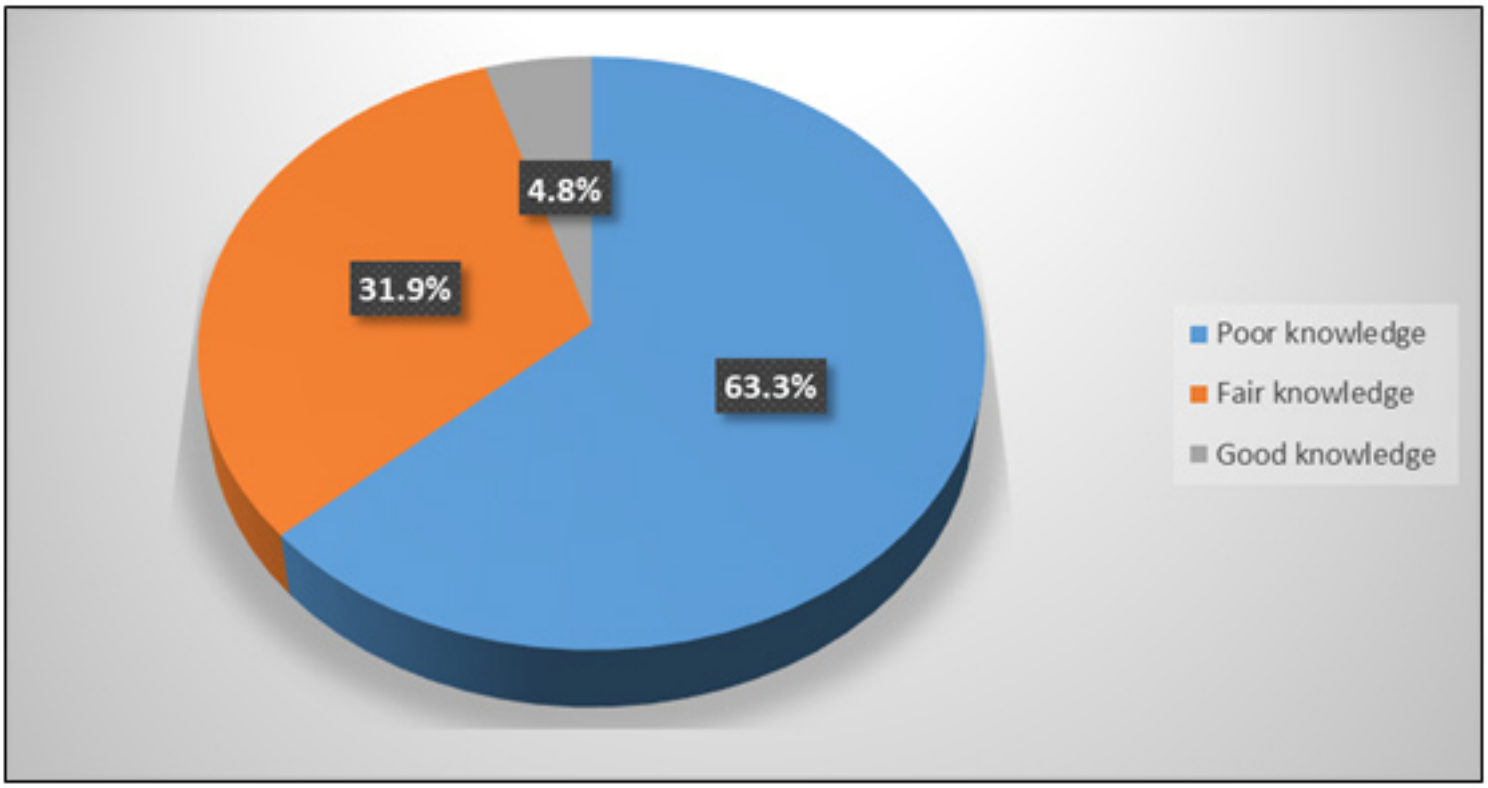
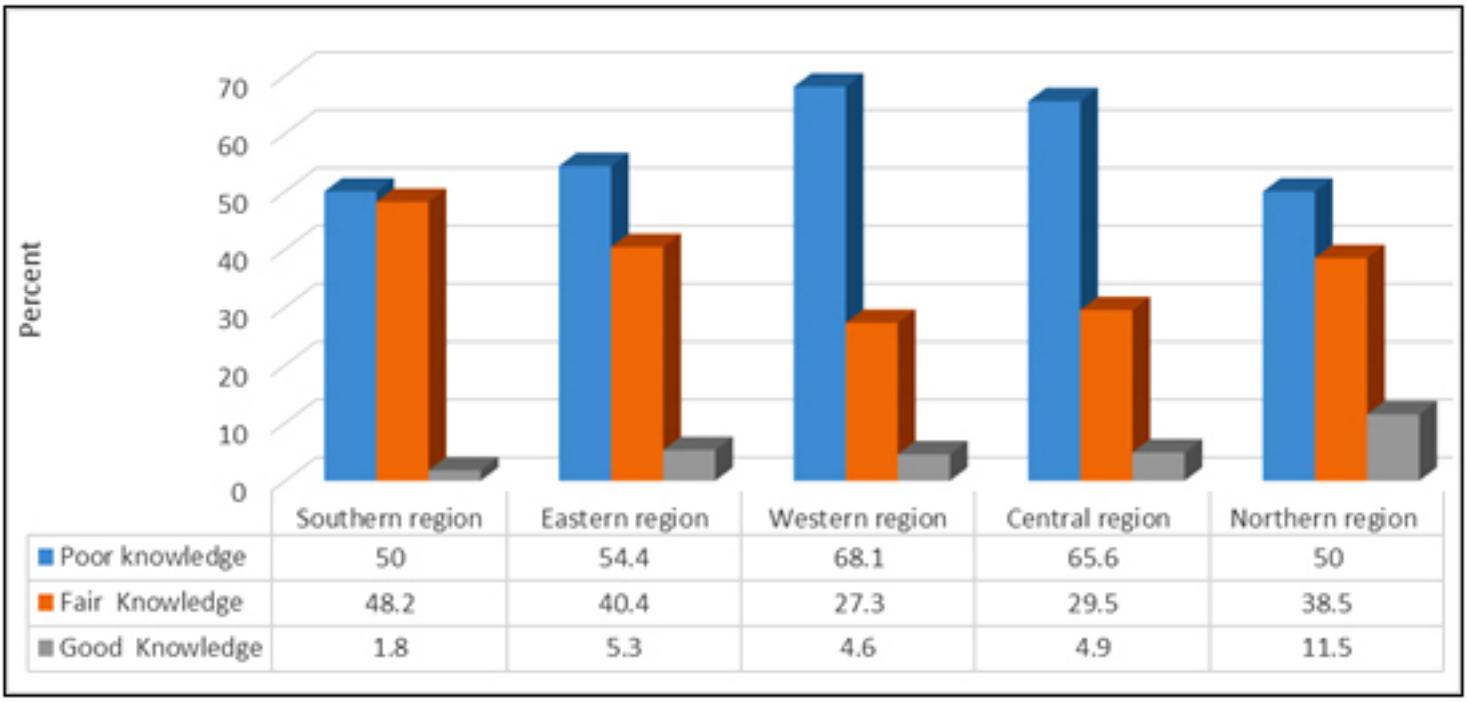


Table 3. Relationship between knowledge level about KC and participants' characters, having an underlying atopic or eye disease, family history of KC, source of hearing about KC and eye rubbing

Variable	Knowledge level			χ^2	p-value
	Poor No. (%)	Fair No. (%)	Good No. (%)		
Age					
under 18	166 (60.8)	94 (34.4)	13 (4.8)	7.31	0.503
19-30	51 (59.3)	29 (33.7)	6 (7)		
31-39	59 (68.6)	25 (29.1)	2 (2.3)		
40-49	34 (70.8)	11 (22.9)	3 (6.3)		
50 or more	9 (91.8)	2 (18.2)	0 (0.0)		
Gender					
Female	254 (65)	122 (31.2)	15 (3.8)	4.2	0.122
Male	65 (57.5)	39 (34.5)	9 (8)		
Marital status					
Not married	169 (61.2)	93 (33.7)	14 (5.1)	1.11	0.571
Married	150 (65.8)	68 (29.8)	10 (4.4)		
Educational level					
Primary	7 (77.8)	2 (22.2)	0 (0.0)	2.88	0.941
Intermediate	7 (77.8)	2 (22.2)	0 (0.0)		
High school	72 (63.7)	37 (32.7)	4 (3.5)		
Bachelor's degree	231 (62.4)	119 (32.2)	20 (5.4)		
Not educated	2 (66.7)	1 (33.3)	0 (0.0)		
Income					
less than 5000 SR	113 (62.4)	58 (32)	10 (5.5)	0.79	0.939
5000-10000 SR	106 (65)	51 (31.3)	6 (3.7)		
More than 100 00SR	100 (62.5)	52 (32.5)	8 (5)		
Do you have an underlying atopic disease?					
No	170 (63.4)	86 (32.1)	12 (4.5)	0.1	0.95
Yes	149 (63.1)	75 (31.8)	12 (5.1)		
Do you have underlying eye disease					
no					
yes	105 (70)	40 (26.7)	5 (3.3)	4.29	0.117
	214 (60.5)	121 (34.2)	19 (5.4)		
If yes, what is this disease?					
Kc					
Dry eye	6 (31.6)	11 (57.9)	2 (10.5)	14.1	**0.029**
Myope/hypermetropia	4 (100)	0 (0.0)	0 (0.0)		
	204 (61.6)	110 (33.2)	17 95.1)		
Family history of Kc					
No	296 (64.8)	140 (30.6)	21 (4.6)	4.6	0.1
Yes	23 (48.9)	21 (44.7)	3 (6.4)		
Source of hearing about KC					
The doctor	16 (37.2)	25 (58.1)	2 (4.7)	70.42	<**0.001**
Readings and lectures	42 (45.7)	37 (40.2)	13 (14.1)		
Friends and relative	28 (54.9)	18 (35.3)	5 (9.8)		
Internet and social media	33 (55)	23 (38.3)	4 (6.7)		
Do you rub your eyes?					
no	78 (63.9)	34 (27.9)	10 (8.2)	4.83	0.089
yes	241 (63.1)	127 (33.2)	14 (3.7)		

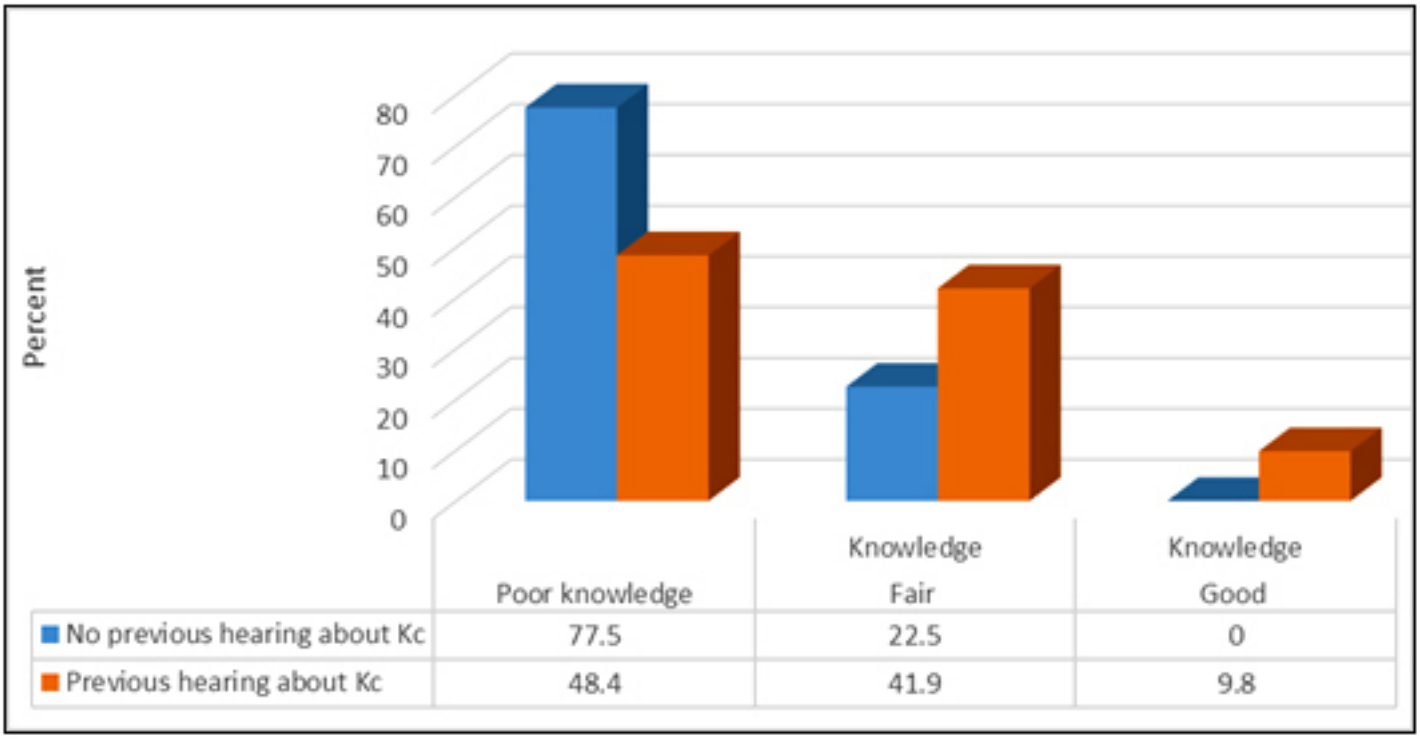
Figure 3. Relationship between knowledge level about KC and participants' residence



	Southern region	Eastern region	Western region	Central region	Northern region
Poor knowledge	50	54.4	68.1	65.6	50
Fair Knowledge	48.2	40.4	27.3	29.5	38.5
Good Knowledge	1.8	5.3	4.6	4.9	11.5

N.B.: (χ^2=16.16, p-value=0.04)

Figure 4. Relationship between knowledge level about KC and previously hearing about KC



	Poor knowledge	Knowledge Fair	Knowledge Good
No previous hearing about Kc	77.5	22.5	0
Previous hearing about Kc	48.4	41.9	9.8

N.B.: (χ^2=56.89, p-value=<0.001)

Discussion

This study aimed to assess the awareness level of keratoconus and its relationship with eye rubbing in the Saudi population. The identification and risk factors of KC at an early stage can lead to a better prognosis. Consequently, a lack of knowledge among the population adversely affects the early diagnosis and management of KC.

This study found that 48.8% of the participants had heard about KC and only 21.4% of them correctly defined the disorder as thinning of the cornea. In a previous study study, 42.2% of the participants had heard about KC and 34.3% correctly defined the disorder (23).

Of our participants, 5.4%, 5.2%, 5.4% and 28.6% reported that eye glasses, contact lens, eye drops and surgery are methods of treatment. In comparison to a previous Saudi study surgical intervention was mentioned as a way of management for KC by 61.8% of the participants, 46.6% reported that wearing glasses limits KC progression, 49.2% reported eye glass or lenses with surgery and 42% said that they don't know about management methods.

The most obvious finding to reveal from the analysis is that the level of awareness about KC was poor in two thirds of the surveyed adult population of Saudi Arabia and only one-third knew that eye rubbing may lead to keratoconus. Similar findings were reported in the urban community in Saudi Arabia with significantly poor knowledge about specific eye diseases (23, 24). Only 4.8% of the participants in this work had a good level of knowledge regarding KC. While, in the previously mentioned Saudi study, the good awareness was detected among 18.7% of the participants (23).

In the present study, most of the participants (75.8%) were rubbing their eyes and for most of them (40.9%) the cause of rubbing was eye itching. The most frequently reported risk factors to develop KC were family history and eye rubbing. However, other studies found that KC has a multifactorial etiology with a strong genetic predisposition and several genomic loci and genes have been identified in this regard (24).

The results of this study do not show any significant relationship between knowledge level about KC and the subjects' characteristics, having an underlying atopic or eye disease, family history of KC or eye rubbing. This outcome is contrary to that found in a previous study (18). Frequent complications of untreated KC are myopia, loss of vision and in this study 49.5% of the participants reported correctly that KC is related to allergy and myopia.

The awareness about management was less compared to the knowledge about causes. The source of knowledge about KC was mainly through lectures and reading about it and mass media, social media and interaction with health personnel were not the main sources of information. This disagrees with a previous Saudi study, where the main sources of information were family and friends, the internet and health care workers (23).

The expected lifetime cost of surgical treatment for KC continues to be a significant burden on the health-care system (27,28). And the treatment of KCN is determined by the stage of the disease and its progression. The earlier onset, steeper cornea, vernal keratoconjunctivitis, and a history of eye rubbing are all risk factors that increase the need for keratoplasty in the affected subject (29).

Limitations

In this study, we faced several limitations regarding the distributed survey through different channels of social media. One of them was that the survey might not have been distributed enough to cover all the different social classes of the population. In addition, the use of a self-reported questionnaire could have recall bias.

Conclusion

This study found that only 4.8% of the participants had a good knowledge about KC, while those who had poor and fair knowledge were 63.3% and 31.9% of the participants. Saudi public awareness about KC was found to be a poor matter that calls for health education programs to raise the public awareness, and directed to all the Saudi community.

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