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Editorial

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This issue is rich with excellent reviews, and with continuous interest in the covid situation. In addition to excellent papers on diabetes, ophthalmological problems, woman issues, cultural issues and literacy.

Al Kaabba, et al., did a cross-sectional, questionnaire-based study design was conducted in Riyadh city in Saudi Arabia. A sample size of at least 412 was required. The total number of respondents that were included in the analysis was 414. The purpose of this study is to describe the knowledge of the Saudi caregivers for diabetic children about Juvenile Diabetes Mellitus, its signs and symptoms and prevention and its complications in children under their care. 399 caregivers participated in this study, most of whom were Saudi (376; 94.2%), gained university degree (300; 75.2%). The most common cited symptom of DM in children was raised blood sugar in children (225; 56.4%), while the most common cited cause was malnutrition (223; 55.9%), and the most common cited symptoms of diabetes was frequent urination (354; 88.7%). Conclusion: This study showed that most type-1 diabetic caregivers had knowledge and awareness regarding DKA in Riyadh, Saudi Arabia. However, some gaps exist. Further studies would assess more factors to enhance the level of knowledge and awareness, and increase the effectiveness toward the right action and response regarding DKA. Whereas, Alghamdi, et al., did a cross-sectional study was done on PHC physicians working in primary healthcare settings to assess the level of knowledge and attitude of PHC physicians toward Insulin Pumps. There was a lack of understanding of the function of an insulin pump and the elimination of the usage of finger sticks, however most of them were aware of the different types of insulin dosages and the appropriate age group for insulin pump therapy. The authors concluded that there is a need for training programmes to increase PHC understanding and attitudes about insulin pump therapy.

In three papers woman issues were discussed. Alkaabba, et al., utilized interview-based questionnaire-based cross-sectional study design. The main aim of this study was to assess pregnant women's knowledge of GDM and its implications towards the mother and fetus. The results indicated that 35.5% of the population had adequate knowledge of GDM and its implication, 34.7% did not have enough understanding of the condition, and a further 29.8% were not aware of the complication. Knowledge about GDM was found to be statistically significant only with the number of pregnancies (p=0.03). The authors concluded that Saudi pregnant women seem to have an inadequate knowledge scope of GDM and its implications to their health and those of their children. Specialized medical institutions and public health initiatives need to implement interventions to raise the awareness of the condition to help in earlier diagnosis and better management of the condition. Zaher et al., did a cross-sectional study using the Domestic Violence Health Care Provider Survey tool among medical and dental interns and residents in the Saudi Arabia to assess the readiness of them to detect, manage and prevent spousal abuse. The authors concluded that lack of teaching and training sessions on managing domestic violence during the undergraduate years shows that health care professionals are evidently underprepared and calls for an urgent need to introduce an interprofessional education curriculum that trains health care professionals of all concerned specialties at undergraduate level on managing domestic violence. Lateef et al., looked at qualitative data from a survey of married women living in urban areas of Rawalpindi are presented here in an effort to better understand their views on contraceptive techniques and the factors that impact their use. A purposeful selection strategy was used to choose participants. The prevalence of any form of contraception, including IUDs, was especially low. According to the finding. The number of young women in the United States who utilize contraception is influenced by social, demographic, and economic factors. Young women's access to contraception may be restricted unless these findings are included into public health programs. Access to family planning information and services for young women is highly recommended.

There are three covid papers in this issue Aldhubayban, & Almuammar did a cross sectional study to evaluate the willingness of the community to be vaccinated against the COVID-19 virus, assess attitude towards continuing to use protective measures after getting vaccinated, and continue to monitor changes in the spread of the COVID 19 virus after implementation of vaccination. out of 302 participants in the research.. The authors concluded that healthcare providers and co-workers are willing to receive the COVID-19 vaccine. Still, we strongly recommend that healthcare providers need more preparation and an evidence-based approach to address the safety and efficacy of the vaccines in the community and build and maintain public trust in the vaccine. Ghamri, & Faidah did a cross sectional study was done on 316 nurses at King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia. The aim was to look at physical activity levels during Covid -19 among nurses. The nurses in the trial had a considerably higher number of days spent doing vigorous and moderate physical activities a week before COVID-19, as well as spending more time doing them. Furthermore, they had a considerably higher percentage of days walking for at least 10 minutes at a time in a random week before to COVID-19. The authors concluded that hospital management should provide in-service education courses on healthy behaviors and physical activity to nurses in order to maintain their health and ensure higher levels of performance. Albasheer, et al., did a cross-sectional study to assess the current knowledge levels, attitudes, and practices of the Saudi Arabian population were assessed based on an online questionnaire survey. The mean knowledge score was

29.36 ± 3.80; 53.7%, 45.2%, and 1.1% of the participants had high, moderate, and low knowledge levels, respectively. The knowledge score was significantly related to the education level ($p<0.001$). the authors concluded that the participants exhibited a high level of public awareness in all sub-scales of knowledge, practices, and attitudes for the prevention of COVID-19. The overall knowledge levels, attitudes, and practices of the Saudi Arabian population were considerably improved since the beginning of the pandemic.

Saleh et al., did a cross-sectional study of 1,500 out-patients aged from 0–30 years attending ophthalmology clinic in Sanaa, Yemen (between 2012-2015) included in the study. The aim of this study was to determine the associations between age and types of presentation of refractive errors in children and young adults 0-30 years All patients underwent visual acuity examination, auto-refractometer, anterior and posterior segment examination, and were grouped according to age and type, i.e., myopia, hyperopia, and astigmatism. Odd ratios (OR) and 95% confidence intervals (95% CI) were calculated to evaluate the association between age and types of presentation of refractive errors. This study highlights the close associations between age and types of presentation of refractive error. Early identification and proper categorization of refractive errors by age, gender, and other demographics by general physicians in primary care can better deduce and make useful referrals to eye specialists.

Alnashrati, et al., reviewed Alexithymia and it's link to Autism. Alexithymia is common, rather than universal, with notably high rates of overlap with autism spectrum disorder (ASD). The authors reviewed description of Alexithymia and its relationship to ASD. Our first aim is to provide a brief definition then focus on the relationship between ASD and alexithymia, including clarifying when and how they originate. as well as their overlap in terms of etiology and features and suggest clinically useful constructs and interventions. Alnatour & Alnashrati reviewed nocturnal enuresis, or involuntary urination, which is a common problem among children. It affects approximately 15% of all children at 5-year-old. Nocturnal enuresis decreases with age, with a spontaneous remission rate of about 15% per year. It can improve with treatment, and improved self-esteem and quality of life have been reported after successful treatment. It is therefore important to offer timely treatment, and to refer children for specialist care when treatments are not effective. The authors discussed definition, epidemiology , etiology ,evaluation and different modality of treatment for nocturnal enuresis . Timorkhan & Safey reviewed the diagnosis and treatment of Bell's palsy. Using internet search, a comprehensive literature review was done and words such as facial nerve palsy, Bell's palsy were searched. In confirmed Bell's palsy, unless contraindicated, corticosteroids should be given to all patients with Bell's palsy as early as possible (ideally within 72 h); Combination therapy with steroids and antiviral agents are recommended for patients with severe to complete paresis. Patients with incomplete eye closure should be given eye protection, with lubricating drops and ointments, to prevent corneal damage. Establishing the correct diagnosis is imperative to avoid missing another treatable condition. Determining whether the facial nerve paralysis is central or peripheral is important. The history of a Bell's palsy case should include discomfort or sensory symptoms in the distribution of the facial nerve in the hours or days preceding facial palsy, and it is very important to reveal whether the symptoms were progressive in nature.

Zaatari , et al., reported a case of Maternal congenital diaphragmatic hernia complicated with left pulmonary compression in the third trimester pregnancy. The maternal mortality due to diaphragmatic hernia is 6%. Cases are often misdiagnosed due to the nonspecific presentation and lack of experience placing pregnant women at risk. This case report discusses the presentation and management of a 17-year-old patient who had congenital diaphragmatic hernia complicated with left pulmonary compression in the third trimester pregnancy

Dr. Alyousef, used Purnell's Cultural Competency framework to focus on communication, family roles and organization, developmental tasks, social status, family dynamics, workforce issues, biocultural ecology, high-risk behavior, physical activity, nutrition, pregnancy, fertility, birth, spirituality, and death from the standpoint of healthcare delivery. The purpose of the study was looking into the absence of insight into these unique lifeways by healthcare providers may limit their caring activities. Each of the sectors discussed illuminated important ways in which Saudi and Gulf society are similar and different from the body of research related to this area. The author concluded that added perspectives which may be useful for provision of care by healthcare practitioners who are unfamiliar with some of the health related lifeways in Saudi Arabia and Gulf.

Alhamidi, & Alyousef, did a cross-sectional survey to assess the level of health literacy of migrant workers in Saudi Arabia. A convenience sample of 127 migrant workers in Saudi Arabia were surveyed using the Brief Health Literacy Screening Tool (BHLST) from September 2019 to November 2019. A comparison of the BHLST scores of the participants was performed. This study adhered to the STROBE checklist. Out of the 127 respondents, 28 reported experiencing health problems, such as hypertension, diabetes mellitus, back pain, hepatitis A, rheumatic disorders, allergy, headache, kidney disease, and colitis. The authors concluded that overall, the findings of the study revealed that most migrant workers had inadequate or low health literacy levels, as indicated by their BHLST scores. The health authorities in Saudi Arabia and other Arab countries need to develop health literacy interventions geared toward increasing the health literacy levels of their migrant workers.

Knowledge of Saudi Pregnant Women Regarding Gestational Diabetes Mellitus and its Complications in Riyadh City, Saudi Arabia

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Abstract

Background: Gestational Diabetes Mellitus (GDM) is recognized as one of the most common preventable diseases related to perinatal and maternal deaths. Despite the high prevalence of the condition worldwide, research cites limited knowledge about the affected population of pregnant women in Saudi Arabia. The main aim of this study was to assess pregnant women's knowledge of GDM and its implications for the mother and fetus. Methods and Materials: The study utilized an interview-based questionnaire-based cross-sectional study design that targeted pregnant women coming for antenatal care visits in public health care centers in Riyadh city.

Results: One hundred and forty-three pregnant women participated. 35.5% of the population had adequate knowledge of GDM and its implications, 34.7% did not have enough understanding of the condition, and a further 29.8% were not aware of the complication. Knowledge about GDM was found to be statistically significant only with the number of pregnancies (p=0.03).

Conclusion: Saudi pregnant women seem to have an inadequate knowledge scope of GDM and its implications to their health and those of their childr en. Specialized medical institutions and public health initiatives need to implement interventions to raise the awareness of the condition to help in earlier diagnosis and better management of the condition.

Key words: Saudi pregnant women, knowledge, Gestational diabetes mellitus, Riyadh, Saudi Arabia

Introduction

The rapidly increasing incidence of Diabetes Mellitus and its growing prevalence across all subgroups have implicated an increasing concern over gestational diabetes mellitus (GDM) as one of the most common medical complications of pregnancy (1). The condition, which is characterized by glucose intolerance which begins or is first diagnosed during pregnancy, records as one of the major preventable diseases related to perinatal and maternal deaths (1,2, 14, 15). Although the condition covers a diverse impact scope in reference to the different social and anatomic characteristics of communities, previous studies ascertain a prevalence range of between 3%-14% across all pregnancies. Besides, the prevalence of GDM is heavily dependent on the incidence of type-2 diabetes in a population (9).

Gestational Diabetes Mellitus (GDM) is often linked to several adverse effects in relation to the compromised immune system. These include infant macrosomia, neonatal hypoglycaemia, caesarean delivery and in worst-case death to both the infant and mother (11). Women with GDM are also at a higher risk for developing diabetes mellitus in a later part of their life (2, 9). Children born to mothers with GDM also hold a higher risk of developing impaired glucose tolerance later. The condition's severity and the probability of incidence relate to some risk factors including higher parity, a genetic history of diabetes, advanced maternal age and body mass index (7). Despite the adversity of GDM, an earlier diagnosis has been proven to reduce risks to both expectant mothers and their children.

The GDM epidemic, as part of the diabetic problem, covers a global scope. A study by Zhu and Zhang (15) identified the variation in prevalence by identifying the Middle East and North Africa as the most prone region with an estimated range of 8.4%-24.5%. Southeast Asia and the Western Pacific follow each with a median prevalence of 11.7%. South and Central America, Africa and North America and the Caribbean median prevalence rates are 11.2, 8.9 and 7.0, respectively, whereas Europe recorded the lowest prevalence range rate of 1.8%-22.3%. While Lawrence, Wall and Bloomfield (8) recorded the diverse incidences, their study introduced a new notion where a third of GDM diagnosed women in New Zealand had no prior evidence of their condition.

Due to their transitional relationship, GDM and Type-2 Diabetes share several pathophysiological identities with glucose intolerance being the most dominant (2, 9). While Diabetes Mellitus mainly occurs as a deficiency against the normal insulin range, GDM has been previously linked to the increased requirement for insulin due to increased placental growth hormone, increased production of progesterone, cortisol, prolactin, oestrogen and tumour necrosis factor (2). Previous biological studies also assert an induced insulin resistance due to the increased production of these hormones.

Over the previous decade, the high prevalence of GDM has triggered medical research interest on its screening and diagnosis. Arora D et al. (3) contributed to this literature by identifying the primary risk factors of the condition. Alia et al., (2) identified ethnicity, a previous condition of polycystic ovary syndrome (PCOS), Pre-diabetes or any genetic condition relating to type-2 diabetes, prior perinatal mortalities and advanced maternal age (>25) as the most substantial screening benchmarks. Research cites insulin resistance as a risk factor for obesity that later advances to hyperglycaemia of pregnant mothers, or increased weight of the fetus. Joham et al., on the other hand, asserted a significant correlation between Polycystic Ovary Syndrome (PCOS) and GDM, characterized by an 11.2% prevalence in PCOS women as opposed to the 3.8% prevalence in normal pregnant women (2). Ross n. et al., (10) also asserted a strong relationship between PCOS and obesity in pregnant women. Obesity, by the affirmation mentioned above, positively contributes to increased GDM incidence.

Since GDM follows a similar pathophysiological framework to type-2 diabetes, prevention holds an imperative role in its management (2, 9). Among these preventive interventions, a healthy lifestyle is associated with a reduced risk of GDM. Statistics reveal a 60% reduced risk of GDM on pregnant women practising a healthy lifestyle (6). However, there have been controversies related to this intervention, including the LIMIT study that only highlighted benefits to Body Mass Index but not the incidence of GDM (2). Although other studies still confirm the benefit of healthy diets and lifestyles, some differ as to the relevance of impact (10). For instance, an RCT Finnish study, called RADIAL found a 39% reduced risk of GDM by healthy lifestyle interventions (2).

Despite the high prevalence of GDM, there is still a significant deficiency in the knowledge held by pregnant women regarding the condition and its implications. Literature has failed in availing significant research on the awareness level of GDM among pregnant women. However, some studies, including a Bangaladesh case research by Monir et al., (6) and an Indian study by Shriraam, asserted poor GDM knowledge in both healthy and GDM-diagnosed pregnant women. Since GDM is officially recognized as a chronic pregnancy condition, increased knowledge should implicate higher self-care practices in reducing prevalence. Increased knowledge should also result in early diagnosis and treatment that will further reduce the adversity of the complications. Several studies also affirm the role of relevant educational information in instilling positive attitudes towards the adoption of a healthy lifestyle, hence increasing the awareness of GDM in pregnant women (1, 12, 13). This study aims to assess pregnant women's knowledge of gestational diabetes mellitus and its complications. The study hypothesizes that there exists a poor knowledge scope of GDM and its implications across pregnant women and their children. An accurate assertion will help medical regulatory boards and pregnant women reduce the incidence of GDM and the severity of the condition.

Material and Methods

The study used a descriptive cross-sectional research design using a validated questionnaire. The online questionnaire was translated to Arabic and distributed to pregnant women regardless their GDM incidence. The only inclusion criteria were pregnancy and personal consent to work within the study, from the chosen women. Convenience sampling, as part of the nonprobability approach, was adopted to ensure the sample characteristics reflected the assertion of the pregnant women population. One hundred and forty-three pregnant women were included.

The online questionnaire was divided into four main sections. The first section focused on the demographics of participants, with a major emphasis on the common risk factors of GDM, followed by questions about other medical factors including the number of pregnancies, parity and gestational age. The second part of the questionnaire assessed the general knowledge of pregnant women about gestational diabetes mellitus. Finally, the third and fourth sections had questions on the effects of GDM on mothers and the effects of GDM on neonatal outcomes. All participants were included solely after being informed that their participation was voluntary and signing an informed consent form.

Variables

The dependent variable in the study was knowledge about GDM and its implication to mother and neonatal outcomes. Demographics, participants' medical conditions and the gestation period encompassed the independent variables.

Data Analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS), version 21.0 software. Descriptive analysis of the data was availed by frequencies, percentages, means and standard deviations. Chi-square was used to analyse statistical significance. P-value of .05 or less was considered as statistically significant.

Results

Table 1 summarizes the demographic features of the particiapnts. Most participants were below the age of 25 (56 – 143 ± SD) at about 40.6%, followed by 25-35 age group (56; 39.2%).

As for the history of previous pregnancies, 55 (38.5%) participants had multiple pregnancies, while 88 (61.5%) had a previous single pregnancy.

Sixty participants were of a gestational period of more than 37 weeks, while 27 participants had a gestational period of more than 40 weeks. The remaining participants (39.2%) with a gestational period of between 37-40 weeks accounted for.

In terms of parity, 33 participants (23.15%) were multipara, while 38.5% were nulliparous while the rest (38.5%). Out of the 143 responses, 54 reported that they know about diabetes mellitus, compared to 54 reported not knowing of the disease.

Overall, 35.5% had knowledge on GDM and Diabetes in general. By contrast, 34.7% recorded not having adequate information about GDM. The rest, 29.8% represented were without any prior knowledge of GDM.

About the knowledge about the effect of GDM, 36.5% reported having adequate knowledge about the effect of GDM on mothers. Further, 36.2% reported limited information regarding the effects of GDM on mothers, compared to 27.3% who did not know of the effects of GDM to mothers.

As for the knowledge of the pregnant women about the effects of GDM on neonatal care, 37.3% reported a clear knowledge scope of the effects of the GDM to neonatal care and the implication to children, compared to 35.9% did not have enough information regarding this clause. 26.8% did not know of their knowledge towards the effects of GDM on neonatal care. The analysis also revealed the highest frequency by the general knowledge of GDM. In the table, participants were more knowledgeable of the 137 index on general knowledge of GDM. The same categorical variable also provided the highest frequency of negative responses.

Table 1. Demographic characteristics of the participants (N=141)

	Variable	Frequency	Percent
Age in years)	25-35	56	39.2
	<25	58	40.6
	>35	29	20.3
Number of pregnancies	Multiple	55	38.5
	Single	88	61.5
Gestational age (in weeks)	37–40	56	39.2
	<37	60	42.0
	>40	27	18.9
Parity	Multipara	33	23.1
	Nulliparous	55	38.5
	Para 1	55	38.5

Table 2. Knowledge about gestational diabetes mellitus (GDM)

Questionnaire question	Knowledge	Freq.	%
Have you heard about diabetes mellitus?	Don't Know	34	23.8
	No	47	32.9
	Yes	62	43.4
Can diabetes occur for the first time in pregnancy?	Don't Know	35	24.5
	No	54	37.8
	Yes	54	37.8
Is family history of diabetes a risk factor for diabetes in pregnancy?	Don't Know	30	21.0
	No	50	35.0
	Yes	63	44.1
	Don't Know	26	18.2
Is pre-pregnancy obesity a risk factor for diabetes in pregnancy?	No	59	41.3
	Yes	58	40.6
Is diabetes in previous pregnancy a risk factor for diabetes in pregnancy?	Don't Know	29	20.3
	No	55	38.5
	Yes	59	41.3
Is rapid weight gain in pregnancy a risk factor for diabetes in pregnancy?	Don't Know	44	30.8
	No	56	39.2
	Yes	43	30.1
Effects of GDM on mothers			
Do you think GDM increases the risk of NVD?	Don't Know	29	20.3
	No	51	35.7
	Yes	63	44.1
Do you think GDM increases the risk of instrument delivery?	Don't Know	36	25.2
	No	56	39.2
	Yes	51	35.7
Do you think GDM increases the risk of emergency CS?	Don't Know	29	20.3
	No	59	41.3
	Yes	55	38.5
Do you think GDM increases the risk of preterm delivery?	Don't Know	25	17.5
	No	67	46.9
	Yes	51	35.7
Do you think GDM increases the risk of PPH?	Don't Know	31	21.7
	No	47	32.9
	Yes	65	45.5

(continued next page)

Effects of GDM on neonatal outcomes			
Do you think GDM increases the risk of high birth weight?	Don't Know	30	21.0
	No	54	37.8
	Yes	59	41.3
Do you think GDM increases the risk of hypoglycemia at birth?	Don't Know	20	14.0
	No	61	42.7
	Yes	62	43.4
Do you think GDM increases the risk of shoulder dystocia?	Don't Know	32	22.4
	No	53	37.1
	Yes	58	40.6
Do you think GDM increases the risk of breech delivery?	Don't Know	26	18.2
	No	55	38.5
	Yes	62	43.4
Do you think GDM increases the risk of congenital neonatal anomalies?	Don't Know	32	22.4
	No	54	37.8
	Yes	57	39.9

Discussion

GDM is portrayed as one of the most common preventable diseases related to maternal and perinatal mortalities. The adversity of its complications depends on some risk factors, with the most medical-related, like obesity, posing more risk. The pregnancy-related condition also holds a high prevalence rate with the most relevant incidence being within developing countries and states with an unhealthy and sedentary lifestyle. Despite this high incidence and the evident adversity of the complication, there exists a low knowledge among the most prone population of pregnant women. This study was aimed at assessing the scope to which pregnant women understood or had knowledge regarding GDM and its implications to both mothers and their infants during neonatal care.

One of the major findings of the study was a higher knowledge of diabetes mellitus and its complications to mothers. Pregnant mothers were also identified as having a high knowledge regarding the effects of GDM on their children. However, the statistics were not optimal for such a population of pregnant women. The implication, given the assumption of those without a clear understanding as part of those without knowledge, is that more than 64% of the sample population had inadequate knowledge on GDM and its effects to their health and those of their children. From these statistics, an estimated 35% had fair knowledge about the condition but with a lack of adequacy to qualify as knowledgeable. The rest, 29%, is an estimate of those with poor knowledge about the condition. In general, the sample did not show significant evidence to assert an adequate prevalence of GDM knowledge across pregnant women.

When participants' awareness of GDM and its effects on both their health and those of their children was assessed, the results suggested that 42 participants, relating to 29% of the population were not aware of the condition. The high prevalence of positive answers (40.643.4%) towards knowledge of GDM was from the final third that assessed the effects of GDM on the infant. Otherwise, most participants did not confirm having enough knowledge of the condition. The study also found that none of the demographics highlighted a relationship with the knowledge of GDM across pregnant women.

The present study was in accordance with most studies of the same research aim. For example, a study by Alharthi et al. (1) found 39% prevalence rate of GDM knowledge in India as opposed to the 41% prevalence rate in Saudi Arabia. The present study results, on the other hand, asserted a slight difference of 2% resulting in 37% as the prevalence rate of GDM knowledge across pregnant women (1). The same study asserted that most participants were aware of GDM and its risk factors but did not possess adequate knowledge of the scope of its impact.

There are also previous studies that assessed the knowledge of GDM across pregnant women. Salhi et al., (13) for instance, assessed the knowledge of pregnant women regarding the effects of GDM by including educational interventions as a controlling factor. Although poor knowledge of GDM was prevalent across pregnant women, educational interventions were asserted as having a positive influence on the prevalent knowledge scope (12). The study also asserted that education level also played an influential role in the knowledge held by pregnant women about GDM. The present study did not assert any of the demographics, except the number of previous pregnancies (p =0.003), as having an influential role to the knowledge of pregnant women bout GDM. Gestational period and parity each had a p-value of 0.033, which by the 0.0.5 alpha level does not show enough evidence to assert a relationship. On the contrary, the referenced study by Salhi et al. (13) found a number of risk factors relevant to the knowledge of GDM across pregnant women. These include educational level, nationality, number of pregnancies, GDM and chronic HTN.

Several studies also assessed the impact of educational interventions like health campaigns on the knowledge of GDM and its effects on pregnant women (12, 13). The results based on such studies were also consistent with the present study's results that affirm a poor knowledge of GDM in pregnant women. However, the limited literature base about the assessment of knowledge towards GDM does not provide a case-specific conclusion. Instead, the relevance of public health campaign on the knowledge of cancer across the same population reflected the significance of the intervention to GDM. A similar study in the United States also affirmed public health campaigns as being beneficial in the diagnosis and management of diabetes.

Conclusion

The growing prevalence of type-2 diabetes has implicated a growing concern about Gestational Diabetes Mellitus. However, current literature fails to provide enough research on the knowledge of this condition across its most prone populations. From this study's results, pregnant women have poor knowledge of GDM and its implications to both their health and that of their children. The study, in reference to other research studies, also asserted that GDM knowledge was dependent on several factors, including educational level and public health intervention. However, the presence of risk factors of GDM did not affect the prevalence of knowledge about the condition. The present study also found that a relatively high percentage of pregnant women are not aware of the condition. The majority of the population also did not possess adequate knowledge of the condition. In this regard, medical interventions related to public health announcements and educational forums should be adopted to aid in increasing knowledge about GDM across pregnant women.

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References

1. Alharthi AS, Althobaiti KA, Alswat KA. Gestational diabetes mellitus knowledge assessment among Saudi women. Open access Macedonian journal of medical sciences. Aug 20;6(8):1522.
2. Alia S, Pugnaloni S, Borroni F, Mazzanti L, Giannubilo SR, Ciavattini A, Vignini A., Impact of gestational diabetes mellitus in maternal and fetal health: An update. Diabetes. 2019;5:1-6.
3. Arora D, Arora R, Sangthong S, Leelaporn W, Sangratanathongchai J. Universal screening of gestational diabetes mellitus: prevalence and diagnostic value of clinical risk factors. J Med Assoc Thai. 2013 Mar 1;96(3):266-71. Colorafi KJ, Evans B. Qualitative descriptive methods in health science research. HERD: Health Environments Research & Design Journal. 2016 Jul;9(4):16-25.
4. Galanis P. Fundamental principles of qualitative research in the health sciences. Arch Hell Med. 2017 Nov 1;34(6):834-40.
5. Goveia P, Cañon-Montañez W, Santos DD, Lopes GW, Ma RC, Duncan BB, Ziegelman PK, Schmidt MI. Lifestyle intervention for the prevention of diabetes in women with previous gestational diabetes mellitus: a systematic review and meta-analysis. Frontiers in endocrinology. 2018 Oct 5;9:583.
6. Lakshmi D, Felix AJ, Devi R, Manobharathi M. Study on knowledge about gestational diabetes mellitus and its risk factors among antenatal mothers attending care, urban Chidambaram. International Journal of Community Medicine and Public Health. 2018 Oct;5(10):4388.
7. Lawrence RL, Wall CR, Bloomfield FH. Prevalence of gestational diabetes according to commonly used data sources: an observational study. BMC Pregnancy and Childbirth. Dec;19(1):1-9.
8. Li Z, Cheng Y, Wang D, Chen H, Chen H, Ming WK, Wang Z. Incidence Rate of Type 2 Diabetes Mellitus after Gestational Diabetes Mellitus: A Systematic Review and MetaAnalysis of 170,139 Women. Journal of Diabetes Research. 2020 Apr 27;2020.
9. Mijatovic-Vukas J, Capling L, Cheng S, Stamatakis E, Louie J, Cheung NW, Markovic T, Ross G, Senior A, Brand-Miller JC, Flood VM. Associations of diet and physical activity with risk for gestational diabetes mellitus: a systematic review and meta-analysis. Nutrients. 2018 Jun;10(6):698.
10. Monir N, Zeba Z, Rahman A. Comparison of knowledge of women with gestational diabetes mellitus and healthy pregnant women attending at hospital in Bangladesh. Journal of Science Foundation. 2018 Sep 13;16(1):20-6.

11. Ogu RN, Maduka O, Agala V, Alamina F, Adebiyi O, Edewor U, Porbeni I, Abam C. Gestational Diabetes Mellitus Knowledge Among Women of Reproductive Age in Southern Nigeria: Implications for Diabetes Education. International Quarterly of Community Health Education. 2020 Apr;40(3):177-83.
12. Salhi AA, Alshahrani MS, Alyamin MM, Hamdi WA, Alyami SR, Almagbool AS, Almoqati NH, Almoqati SH, Al-Saaed EA, Al Habes HS, Alwdei BM. Assessment of the knowledge of pregnant women regarding the effects of GDM on mothers and neonates at a Maternal and Children hospital in Najran, Saudi Arabia. Parity.;40(34):6-8.
13. Silva Junior JR, Souza AS, Agra KF, Cabral Filho JE, Alves JG. Gestational Diabetes Mellitus: the importance of the production in knowledge. Revista Brasileira de Saúde Materno Infantil. 2016 Jun;16(2):85-7.
14. Zhu Y, Zhang C. Prevalence of gestational diabetes and risk of progression to type 2 diabetes: a global perspective. Current diabetes reports. 2016 Jan 1;16(1):7.

Patterns of Social Interaction and Lifeways which Affect Health and Healthcare of Families in Saudi Arabia and the Gulf States

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Abstract

Background: Lifeways of Saudi Arabia and neighboring Gulf States form a unique pattern. A large portion of healthcare providers are foreign nationals.

Purpose: The absence of insight into these unique lifeways by healthcare providers may limit their caring activities. Review of related literature has suggested that dissonance between clients and care providers may be a barrier to care.

Method: Purnell's Cultural Competency framework was utilized to focus on communication, family roles and organization, developmental tasks, social status, family dynamics, workforce issues, biocultural ecology, high-risk behavior, physical activity, nutrition, pregnancy, fertility, birth, spirituality, and death from the standpoint of healthcare delivery.

Results: Each of the sectors discussed illuminate important ways in which Saudi and Gulf society are similar and different from the body of research related to this area.

Conclusion: This inquiry has added perspectives which may be useful for provision of care by healthcare practitioners who are unfamiliar with some of the health related lifeways in Saudi Arabia and Gulf.

Keywords: Lifeways; Health; Healthcare; Families; Gulf-States

Introduction

Each society is marked by unique characteristics and lifeways which affect the way individuals within those societies address their needs for health care. A comprehensive discussion of lifeways particular to Saudi Arabia and Gulf States and effect of these habits on health care, has not yet been made available to the healthcare community. A number of lifeways which are practiced have important implications in the care of this population and insight into these patterns may assist in improving care by healthcare providers of all types.

According to Meleis in 2012, uniqueness may encourage us to consider the diversity and individuality of societies of interest, while at the same time seeking to apply what we know from the overall body of knowledge about caring (1). This body of knowledge may assist in understanding patterns of social interaction in Saudi Arabia and Gulf States of Bahrain, Kuwait, Qatar, United Arab Emirates, and Oman where lifeways form a single similar pattern (2). Although the need for information about caring for this population has been supported by studies cited in this inquiry, little has been found which offer useful guidance. A comprehensive discussion of Gulf States lifeways which relate to health consumption may assist healthcare providers in that locale.

Materials and Methods

Purnell, uses a theoretical model in analysis which may guide readers toward ways of providing care for Gulf States clients. It may also be helpful in providing a practical model for observing other cultures and locales for the purpose of improving healthcare delivery (3). The Purnell Model for Cultural Competence displayed in Appendix A provides a framework for viewing and assessing patterns of healthcare needs and consumption of any chosen culture or group and was therefore chosen as a lens for viewing Gulf culture (3).

This review includes search of available sources from online search engines such as Pubmed and Pubmed Central which list certain journals and sources which are not available from Web of Knowledge and EBSCO. This search resulted in a comprehensive bibliography of the focus sectors in the Purnell Model as follows.

Results

Overview/heritage

The overwhelmingly strongest element of Gulf culture is the Islamic faith (4,5). Mediated by patterns of social interaction of a primarily tribal pastoral desert dwelling society, religion is the basis for all activities including health behavior (4,5,6).

Muslims are encouraged to seek treatment and medical care. Islamic teachings promote moderate eating, consumption of hygienically prepared foods, regular exercise, and avoidance of alcohol, tobacco, or recreational drug use. Strict standards for personal hygiene as codified by the Hadith contribute to positive attitudes toward cleanliness. Due to Bambia, Faiz, and Boughanem, three large urban centers in Saudi Arabia account for 85% of the population, with similar demographic patterns in the other Gulf States (7). This area of the world is strongly influenced by tribal origin, although there are also large communities of immigrants (8). Each tribal person is aware of their tribal origin.

The ideal marriage is a life-long relationship although a divorce rate of 21% is reported in mass media (9). Marriage within the tribe is the ideal. It is a civil contract and cousin marriage is the most desirable (8,10). The most preferred residence is a villa which describes a detached or semi-detached housing unit, regardless of size. Urban sprawl causes long journeys for patients to healthcare venues. According to UNICEF, Adult (15 years+) literacy rate in Saudi Arabia is 87% (11). Nearly 5 million students are enrolled in gender segregated Saudi schools and universities (8,12). Healthcare providers find widely varying levels of literacy and health literacy among healthcare consumers. This variety of education competency should be considered when forming care plans.

Communication

According to Burnham, Saudi Arabia and GCC countries have highly up-to-date internet and telephone systems (13). A poll in 2003 found that two thirds of Saudi citizens have access to the internet (14). Additionally, according to Assad, influx of oil wealth and increased communication with other cultures has influenced individual priorities and lifestyle, pushing materialism forward (15).

Healthcare providers need to be aware of the etiquette, style, and character of communication. During establishment of rapport with clients correct naming is essential and may be complicated; each person having four names; women using their birth name, and high levels of duplication. These patterns can have major implications for healthcare providers and care must be taken to avoid accidents which could potentially affect client health and safety.

Communication Context

Communication style is high-context. Because of this members are able to understand messages with less explanation and more innuendo and implicit references (16,17). High-context communication is characterized by avoidance of interpersonal conflict and this is true of social interaction in this area. According to Almutairi and McCarthy, group consensus is of higher value than individual expression (18). Healthcare providers must also be cautious about power differentials which may alter communication between themselves and their clientele and interpersonal communication between clients and client groups.

Non-verbal Communication and Etiquette
Use of hands in talking is common and a set of gestures is well understood. Males stand quite close to each other, as do females but when a male and female are interacting, the personal space is quite expansive and no touching occurs. Al-Shahri, stated that healthcare professionals may find that clients of the opposite sex do not wish to be touched by them although they are reluctant to express this feeling (19). Every effort should be made to have a same sex professional available especially if care involves touching (17,19).

Men and women who are not related by birth do not generally engage in social conversation in public. Even in a professional setting it is not uncommon for female clients to communicate to male healthcare providers through a male proxy who has accompanied her. Male healthcare providers are strictly advised to avoid interviewing or examining any female client unless she is accompanied by her male proxy and preferably also a female staff member (16). Parameters of polite conversation may vary between social groups and this may be a source of dissonance (4,10).

Another important aspect of communication is "face". Saudi and Gulf societies are tribal, high-context, and relatively small. Therefore, members of society are familiar with each other's social position. Those with more "face" may receive preference. Housemaids and migrant laborers may receive more comprehensive care when accompanied by their employer because of this dynamic. Shame is a concept which is deeply entrenched. Activities which are either morally unacceptable or simply bad manners may cause this. Honor is a stronger concept in weighing behavior. Loss of honor is caused by violation of law or moral percept. Awareness of parameters of social interaction is of vital importance in societies of all types but is particularly essential when personal interactions are highly circumscribed by tenets and codes. Emphasis on awareness of social climate should be part of orientation of all healthcare professionals.

Family Roles and Organization
According to Kalu, Saudi society is very patriarchal (21). A senior male is responsible socially and legally for the welfare, health, care, and behavior members of all ages in the household (20,21); they are also legally responsible for other persons such as aged parents, and widowed or divorced sisters and aunts who may or may not live in the household. Women do not customarily live alone (22). Ratner and El-Badwi, argue that the legal and civil matters for female relatives often require his assistance (23). Healthcare providers need to consider the pressures, stresses, and demands which are carried by the head of large families in all phases of care planning.

While the male head traditionally holds responsibility for the extended family, women bear responsibility for the welfare of all within the home including management and developmental tasks. Employed women who comprise 22% of all adult women have the double burden of household and workplace responsibilities (7). Consequently, the housewife is a skillful micro-administrator.

In addition, several studies argued that the living arrangements vary but the norm is that family always comes first. The concept of family to Saudis and members of the Gulf States describes nuclear or extended family, and tribe which provide support for each other (10,12,24). Being a collectivistic society, consensus, hospitality, generosity, and honor are highly valued over individuality and non-conformity (9). In addition, Alhamidi stated that a mixed methods inquiry found that consensus and hospitality of guests had priority over providing healthy dietary choices for children, perhaps contributing to childhood obesity (8).

Since religion is the basis for the social system and norms the best available way to gain a perspective on ideal family relations is to consult the Quran and Hadith. A healthcare provider who depends on this source will not go wrong.

Dress
Most practices in Gulf society are dictated by religious or tribal principles. A highly visible example of this construct is dress. Female sexual chastity and modesty are part of family honor and influences the style of dress. Men are less restricted but also are subject to certain strictures. Further, tribal traditions such as veiling of the face have taken on a religious aspect and are incorporated into the code of expected dress by many. Often this restricts exercise options. Healthcare providers should be aware of this aspect of dress when forming a care plan, for example, recommendation for physical exercise (8,2).

Gender Segregation
Another construct which has received conservative interpretation is public mixing of gender. Due to Almutairi and McCarthy, stated that the health practitioners in Saudi Arabia need to bear in mind the necessity of providing same gender care although in cases of need this principle may be bypassed (18). Separate facilities such as vital signs rooms, physical therapy, and phlebotomy suites need to be provided since a certain amount of disrobement may be required.

Developmental Tasks
The major person in children's lives is the mother. While men are expected to be the economic pillar of the family, the mother is expected to bear responsibility for education, social, and health care of her children. Maternal grandmothers are especially influential. This is reinforced by the segregation by gender which characterizes all educational, social, and health institutions (12).

Health care providers for young children up to about the age of ten, usually are in contact with mothers, or a grandmother. However, when major health events are being planned – such as surgery or travel to a referral center, fathers and mothers must be included. This is especially true of mothers who are not literate or living in urban areas. Special efforts must be made to involve the male proxy when interviewing or treating young children if the healthcare professional is a male (8).

Social Status

Saudi society bases class on a variety of criteria. These criteria interact. Attributes in one criteria mediate the effect of other characteristics which are part of the formula. Tribal membership is an important element in social status. Individuals who are of tribal origin have higher status in some regions of the Gulf. Intermarriage between tribal members and members of other tribes is the ideal (7). However, the tribal system is weak in some regions such as coastal areas. Lineage which can be traced back to Prophet Mohammed (pbuh) is used to designate elevated status in Hejaz, the Western area of Saudi Arabia.

In addition to tribal status, education, wealth, and religiosity are mediating factors. For example, a person from a distinguished tribe may be considered lower-class if the lifestyle they pursue violates social norms, while a religious or highly educated person, can be highly regarded and elevated in class (16). Merchants, religious scholars, distinguished intellectuals and professionals mainly form the upper-middle or middle class. This status is conferred on the individual and his nuclear family but not his or her extended family. Therefore, any individual may have a variety of social statuses within the extended family (2).
The construct of "nas" is useful for understanding social structure. One who is elevated in status is referred to as "walid nas" or "bint nas" meaning son or daughter of "people". This evaluation can vary depending on the status of the evaluator and usually implies that the person in question is at or above the status of the speaker. It is therefore a very flexible concept.

The use of social status is important in access to resources (11). Because this is a high-context society, social influence as a determinant of distribution of resources is common (8).

Socially well placed members of tribes or families are very frequently requested to intervene on the behalf of a lower status member for the purpose of access to services and socially mediated resources including health care. Healthcare providers should be aware of these dynamics in social structure. Access to specialized medical care is frequently obtained in this way and should be considered as a resource during assessment, diagnosis and care planning.

Family Dynamics

There are happy households where relationships are harmonious and others where they are not. Healthcare providers will find many varieties and qualities of relationships in practice. Unfortunately, empirical reports concerning family relations were not found in the literature (25).

Moreover, several studies indicated that the healthcare providers should avoid stereotyping family dynamics and social standing but instead perform as thorough an assessment as possible before forming a diagnosis and care plan. Professional ethical practices such as individualization, self-awareness, non-judgmental attitude, empathy, and avoidance of stereotyping assist healthcare professionals to assess, diagnose, and navigate client needs based on individual family dynamics (4,6,12,26).

Workforce Issues

The migrant work population which constitutes about one-third of the population is drawn from extremely diverse lifestyles and cultures. Many are from the poorest segments of their home countries. Although required to meet certain health standards to obtain a work visa, it is mainly for the protection of the local population and not an indication of general good health. Therefore, healthcare providers are caring for an extremely diverse group of clients who may have important health problems (27).

Caring for the Healthcare Workforce

Healthcare providers are also a diverse group. The vast majority of healthcare providers who are in direct contact with clients are foreign. They are mainly drawn from the Philippines, India, Egypt, Jordan, South Africa, Uganda, the United Kingdom, and the United States. Each of these groups bring their own culture to the workplace. Between the years 2000 and 2008 a total of 53,771 Philippine nurses began employment in Saudi Arabia (28).

In addition to the learning about Saudi culture and language these workers need to learn about each other (8,28). Difficulties are encountered with patient care and communication between patients and staff and between staff members. In a cross-sectional study of burnout syndrome among Saudi and non-Saudi nurses levels of emotional exhaustion were significantly higher ($p=0.004$) among the non-Saudi nurses than the Saudis (29).

In a review of 8 studies which inquired into key issues, problems, barriers, and challenges in university hospitals in Saudi Arabia it was concluded that improvement in patient safety, clinical effectiveness, and patient-centeredness were important problems in delivering quality client care and were especially exacerbated by lack of instruction and effective communication between clients and healthcare staff (27)

Nursing education must prepare local graduate nurses from the variety of ethnic groups within the Gulf to assess and diagnose client and community needs effectively. Cultural competency skills should be included in the nursing curriculum. Orientation and training of the multicultural, multinational workforce which now characterizes the healthcare team in the Gulf must be well planned. The healthcare professionals from the huge variety of ethnic origins require culturally competent training. Indigenous healthcare professionals are well suited for this purpose but must be appropriately prepared for the task themselves with training in pedagogy.

Bio-cultural Ecology

Added to the gene pool of original tribal groups are influences from immigrant migration and trade. According to Abo-Amero et al, analysis of mitochondrial DNA from buccal swabs of 120 maternally unrelated Saudis who gave histories of having ancestors of Saudi Arabian origin found that 85% of the lineages are of western Asian origin while Sub-Saharan Africa, North-African, and Indian influence was found to be 7%, 5%, and 3% respectively (30).

Consanguinity is quite intense because of the popularity of marriage within the family. In a sample 3212 Saudis in a cross-sectional random stratified study an overall rate of 57.7% consanguinity was found including 28.4%, 15.2%, and 14.6% marriages involving first cousin, distant relative, and second cousin marriages respectively. In other Gulf States the rate of consanguinity is nearly identical (22,31).

Implications for healthcare providers relies on patient education. Considering the rate of congenital defects in the population, and the limits on abortion, control of birth defects through genetic counseling may need to be addressed. Therefore, pre-marital screening to identify carrier states and counseling, public education, and establishment of a national registry and mutational database seems to constitute best practice for this area of the world (1,17,22).

High Risk Behaviors

High risk behavior occurs but because of the conservative nature of the social structure, information about these practices is highly limited. Access to treatment may be complicated by social, legal, and religious implications for clientele. Therefore the incidence of these behaviors are considered to be highly under-reported (32).

Use of Tobacco

From a conservative social point of view tobacco smoking or use in Gulf States is frowned upon. Tobacco is used via cigarettes or water pipe. Water pipe has been found to produce similar levels of nicotine dependence as other forms of tobacco (33). In a cross-sectional study of 1,652 Saudi secondary school students it was found to be the form of consumption for 54% of the 30.3% and 8.5% females who are smokers in Al-Hassa (29,34).

Use of Alcohol

According to Haqwi, alcohol consumption is strictly prohibited by Islam and therefore is strongly rejected by the norms of society (35). Sale, production, or consumption of alcohol is illegal in Saudi Arabia and Kuwait. Alcohol is sold on a limited basis to expatriates and at tourist venues throughout other Gulf States. However, in Ha'il 7.5% of a group of respondents in a cross-sectional convenience sample collected among volunteers in schools, health centers, and shopping venues reported consuming alcohol (36).

Other Illegal Substance Abuse

Due to Fageeh, trafficking in illegal drugs in any capacity carries a death sentence. However, cannabis, cocaine, and heroin are present, although at low levels (37). Additionally, according to World Health Organization (38), a drug locally known as Captagon, the local name for fenethylline, a synthetic amphetamine, is abused by youth to pursue a lifestyle of night life, during exam time, and among truck drivers (39,40).

Khat is illegally grown locally and also smuggled from Yemen. In a cross-sectional study self-administered questionnaire of 10,000 college and secondary school students in Jazan Province consumption was 21.4%. A gender difference existed with 3.8% and 37.7% of females and males respectively being Khat users (41).

Sexually Transmitted Infections

Information regarding incidence of sexually transmitted infections (STI) is difficult to access. Non-marital sexual relations and homosexuality are prohibited and illegal limiting information. As of 2005 gonococcal urethritis, syphilis, and HIV accounted for 14.2%, 8.7%, and 7.5% of reported STI cases respectively. Male expatriates accounted for two thirds of reported cases of HIV (36).

Implications for healthcare providers in assessing high risk behaviors should include a high level of awareness. Gulf society requires visible behavior to conform to ideals, laws, and beliefs. Clients may not report behavior. Intuitive and objective client assessment is therefore highly important.

Road Traffic Accidents

Saudi Arabia has the worldwide highest incidence of road traffic deaths and spinal cord injuries (42). Among deaths in public hospitals 81% result from traffic accidents, occupying 20% of the total bed census and accounting for the majority of maxillofacial fractures in Saudi Arabia (43, 44).

Physical Activity

Sedentary lifestyle is related to unfavorable weather conditions making out-of-doors exercise impractical (45). Walking for pleasure is not an important part of the local social structure. The urban built environment is not well designed for pursuit of outdoor exercise.

It is not surprising that less than 50% of boys, aged 7-11 years, reported that they participate in moderate physical exercise. Adults report any exercising as 19% and 0.5% respectively for males and females (46,47).

Nutrition

Badran and Laher, profess that food choices have been changing (47). A traditional diet based on whole grains, fermented milk, and dates is being displaced by rice, meat, convenience and fast food. Whereas feasting was limited to special occasions such as weddings and births in the past, it is now common as week-end entertainment, causing concern to investigators (46,48).

Obesity in the Gulf Countries

Increasing body weight is causing alarm from healthcare providers (49,50,51). Large systematic reviews and meta-analyses are not yet available to define this problem. However, a meta-analysis of adults aged 30-60 years in Kuwait, Qatar, and Saudi Arabia found the obesity rate among men and women ranged from 70-85%, and 75-88% respectively with being overweight and obese were 21.5% and 13.7% respectively among children (52,53). Due to Alhamidi, low levels of activity, priority of family social lifestyle, ready availability of obesogenic foods, and intrafamily patterns of interaction and discipline were found to affect the obesogenic environment in Saudi homes (4,8).

Significance of Food
Food is used as a means for giving and receiving status. The ultimate food offered to guests is a whole sheep. This pattern of use of food for social purposes has implications for clients who must adhere to special diets. Counseling, role play, and mentoring may be helpful in meeting challenges for these clients (4,8).

Pregnancy, fertility, and birth
Children are considered a vital part of life. Index Mundi, referencing the CIA World Factbook, projects the total fertility rate in 2016 to be 2.11 children per woman. Children under 14 years and elderly (65 years +) constitute 60% and 3% respectively (54).

Infertility poses a threat to marriage. Divorce or polygyny may be an outcome. Treatment for infertility is not restricted to childless couples and many high tech possibilities to enhance fertility are available in the Gulf. Potentially harmful procedures by traditional healers may also be employed by many as a last resort to produce offspring.

Pregnancy is not considered a delicate condition and pre-pregnancy health status is expected to continue during pregnancy. Additionally, according to UNICEF, 2014, women continue to fulfill all of their familial and household duties. Home birth is not popular and hospital delivery occurred at the rate of 97% in Saudi Arabia in 2015 (42). Postpartum care instruction occurs just before discharge of the new mother from the hospital. Breast-feeding instruction is not practiced. Upon discharge mother and baby traditionally reside with the maternal grandmother for a period of 40 days. All normal activities are resumed at the end of this period.

Contraception
Among a sample of 502 participants attending government funded primary health care centers in the Qassim area, those women who are older, working, more educated, and grand multipara are more likely to use contraception while less educated, lower income, and having a higher proportion of female children have narrower spacing. Overall, users of some form of contraception numbered 44.8% (55). Among 786 ever-married women the average time between deliveries was 2.38 years (56).

There are a multitude of implications for best practice during pre-pregnancy, pregnancy, delivery, and postpartum. Culturally competent health promotion efforts are needed for all stages of perinatal care. This begins with appropriate assessment, diagnosis, planning, implementation and evaluation of social interaction patterns and available resources in order to guide design of programs which are culturally congruent, attractive, and accessible to stakeholders and target population as a whole (4,5).

Death
Based on the interpretation of the Holy Quran, the correct approach to illness is a search for improvement or cure. In a qualitative study of 284 Muslims near death three important domains were found to be important concerns: faith and belief, self-esteem and image related to their behavior and appearance at the time of death. Security of remaining family also emerged as an important theme (44).

In a cross sectional convenience study conducted by Mani and Ibrahim, intensive care unit (ICU) nursing staff role were studied and a wide gap existed between concept of the role and method of the caring process at the end of life among professional caring staff and family members of patients (57). This gap needs to be addressed by education accompanied by a formulation of end-of-life care policy in ICUs which is in agreement with culture and belief among the Saudi population.

The expressed goal of the healthcare community care is preventative or curative in the Gulf States with palliative care not being a well-developed concept. Pre-morbid directives popular in the West are not popular among health care professionals or the community at large (27).

In a cross-sectional study 98% of oncology patients stated that they preferred being fully informed about their diagnosis whereas 92% of their physicians agreed. These results point to a potential failure to meet communication needs of patients and their families (58).

Breaking bad news to patients is problematic finding that 10% and 5.15% of physicians employed in hospital and primary care respectively agreed to the statement “I usually avoid telling my patients about their final diagnosis” and 46.6% of the physicians employed in hospitals agreed with the statement: “The patient always has the right to know his/her diagnosis” (59).

Spirituality
The main basis of Gulf society is the Islamic faith with interpretation by a generally conservative point of view, and further mediated by tribal customs. This forms a unique blend which characterizes the area’s spirituality (19,57).

Implications for healthcare providers are the application of non-judgmental caring accompanied by good knowledge levels about religious beliefs and practices of the target group, self-awareness, and empathy. Nurses need to be aware of their own comfort level in providing spiritual care and to understand the level of spiritual need of the patient and caregiver. This individualization enables the nurse to plan for delivery of systematic spiritual care from a variety of available sources within and outside the healthcare community (60).

Healthcare Practices
Care of one’s body and health is considered a right of the living body which the soul inhabits (46,60). Use of physicians and medicines to treat illness is religiously encouraged. When Prophet Mohammed (pbuh) was asked about medical care he replied: “Yes, you should seek medical treatment, because Allah, the Exalted, has let no disease exist without providing for its cure, except for one ailment, namely, old age” (61).

Health Locus of Control

Health locus of control (HLC) in the Gulf has been found to be influenced by several factors. Until very recently curative rather than preventative care has been the focus of the health system (46,61). Preventative care remains secondary to administration of primary care. This atmosphere requires the client to have a high internal HLC and strong general self-efficacy due to the obstacles met in the health care system in the pursuit of this goal (61).

Traditional Healing Practices

Traditional healing has an important place in health care among the people of the Gulf. The use of traditional practices is used before, after, or concurrently with conventional health care.

Based on the WHO cluster sampling method, 462 families were assessed using a structured questionnaire to determine the patterns of utilization of traditional medicine. Belief in the effectiveness of traditional medicine was expressed by 51% of clientele but was actually used after failure of conventional treatment by 25% of the group studied. Elderly, female, and illiterate clients are more likely to use traditional healers than other groups. Among clients surveyed, 42% had ever consulted a traditional healer at some time with 24% having done so within the past 24 months (62).

Clients may use a variety of non-conventional treatments which are not considered to be traditional Saudi healing. They are often costly and not yet regulated. The Council of Ministers has approved a center responsible for establishing rules, criteria, conditions, and licensing of these practitioners (37).

Healthcare providers must become familiar with the traditional healing practices and beliefs of the target population. These may vary between ethnic groups in the Gulf area, but because of the high incidence of use among the client populations, knowledge about and sensitivity to these beliefs and practices may have a major impact on care.

Mental Health

About half (50%) of primary care patients studied blamed nerves, stress, and religious factors as a cause for their physical symptoms so that the effect of mental and emotional factors on illness is recognized by the population (63). However, mental health is not freely discussed, and at times even immediate family members are unaware that this type of care is being used by the client. Punishment by God is considered one source of disturbed mental health. Supernatural forces such as witchcraft and evil eye are used to account for other types of conditions by clientele (64). Awareness of this attitude is important because clients are not likely to freely request care for mental health problems from their healthcare practitioner.

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Conclusions and Limitations

By examining features of the target population perspectives may have been gained into the variety of lives of its people and their lifeways. There may be limitations in use of this analysis based on regional differences and practitioners will be well advised to employ this guide as a starting point in understanding healthcare needs and client characteristics. Common threads which run through the fabric of the Gulf States have been discussed giving the practitioner a starting point for considering the health care needs of the people living there and how best to address them.

Congruity of care priorities between healthcare professionals and clientele need exploration. In phenomenological descriptive collections of narrative gathered by six expatriate critical care nurses, the central themes which emerged from caring for Saudi clients were family and kinship, cultural and religious influences, and the nurse-patient relationship which was complicated by stressful and frustrating communication patterns (37,64). In ranking care priorities, clients ranked information, cultural, and spiritual needs as the dominant needs. Support and proximity were least important to them which may be easily understood because of the highly supportive patterns of social interaction between family members.

In a cross-sectional study using a self-administered questionnaire to inquire from 176 family members and 497 intensive care providers in adult medical-surgical units about the needs of families at the time of death, researchers found that looking for information, maintaining reassurance, spiritual healing, maintaining close proximity, and respect and care of the body of an expired family member were top concerns. While care of the remains of an expired family member was ranked in fifth priority by health providers it was the first concern of the family members studied. This dissonance of priorities between family members and staff suggests that much more effort may be needed in establishing a culturally competent environment for critical care patients and perhaps others (65).

Specific values are contained in the ANA Code of Ethics which have resulted in the concept of cultural competency by American Nurses Association (66). The inherent dignity of the individual, autonomy and the right to self-determination are important concepts when caring for all clientele. Social work values such as empathy, confidentiality, self-awareness, client individualization, and non-judgmental attitude are also part of the values which nurses who wish to be effective in caring must work toward (67).

Evidence-based research and a sound knowledge based on needs of our target population must be coupled with values and ethics to form a powerful formula which can be used to provide culturally competent caring and best practices. When these elements are combined with specific language and lifeways training during pre-service and ongoing orientation programs, a comprehensive orientation for caring for culturally diverse clients emerges.

References

1.Meleis AI. On needs and self-care. Theoretical nursing: development and progress. 5th ed. Philadelphia: Lippincott Williams & Wilkins. 2012:207-8.

2.Varshney D. The strides of the Saudi female workforce: Overcoming constraints and contradictions in transition. Journal of International Women's Studies. 2019;20(2):359-72.

3. Purnell, L. D. (2016). The Purnell model for cultural competence. In Intervention in mental health-substance use (pp. 57-78). CRC Press.

4. Al-Hamidi SA. Investigation of Cultural, Social, and Religious Aspects of Saudi Arabia and Neighboring States and Implications for Best Practice in Health Education and Promotion.

5. Aldossary A, While A, Barriball L. Health care and nursing in Saudi Arabia. International nursing review. 2008 Mar;55(1):125-8.

6. Al Dossary SS, Sarkis PE, Hassan A, Ezz El Regal M, Fouda AE. Obesity in Saudi children: a dangerous reality. EMHJ-Eastern Mediterranean Health Journal, 16 (9), 1003-1008, 2010. 2010.

7. Bambia M, Faiz R, Boughanem M. Context-awareness and viewer behavior prediction in social-TV recommender systems: survey and challenges. In East European Conference on Advances in Databases and Information Systems 2015 Sep 8 (pp. 52-59). Springer, Cham.

8. Al-Hamidi S. Exploring the Relationship of Parental and Home Influence on the Dietary Intake of Saudi Arabian Children Aged 6-12 Years (Doctoral dissertation, Catholic University of America. 2017.).

9. Al-Asfour A, Khan SA. Workforce localization in the Kingdom of Saudi Arabia: Issues and challenges. Human Resource Development International. 2014 Mar 15;17(2):243-53.

10. Al Khateeb JM, Al Hadidi MS, Al Khatib AJ. Arab Americans with disabilities and their families: A culturally appropriate approach for counselors. Journal of Multicultural Counseling and Development. 2014 Oct;42(4):232-47.

11. Umahi EN, Atinge S, Agbede C, Muhammad KU. Knowledge, perception, and satisfaction of mothers regarding antenatal and postnatal care services in Ikenne Local Government Area, Ogun State. The Nigerian Health Journal. 2020 Mar 4;19(2):70-84.

12. Alyousef SM, Alhamidi SA, Albloushi M, Eid TA. Perceptions of media's contribution toward stigmatization of mental health by Saudi Arabian nurses. Journal of the American Psychiatric Nurses Association. 2020 Nov;26(6):568-75.

13. Burnham CR. Public diplomacy following 9/11: The Saudi peace initiative and "allies" media campaign. Exchange: The Journal of Public Diplomacy. 2011;2(1):7.

14. Alshomrani S. A comparative study on United Nations e-government indicators between Saudi Arabia and USA. Journal of Emerging Trends in Computing and Information Sciences. 2012 Mar;3(3):411-20.

15. Assad SW. The rise of consumerism in Saudi Arabian society. International Journal of Commerce and Management. 2007 Dec 31.

16. Hungenberg E, Ouyang L, Gray D. Measuring the information search behaviors of adventure sport tourists. Event management. 2019 Feb 1;23(1):75-91.

17. Martzoukou K, Sayyad AE. Everyday life information literacy: a review of literature. 2016.

18. Almutairi A, McCarthy A. A multicultural nursing workforce and cultural perspectives in Saudi Arabia: An overview. TheHealth. 2012;3(3):71-4.

19. Al-Shahri MZ. Culturally sensitive caring for Saudi patients. Journal of Transcultural Nursing. 2002 Apr;13(2):133-8.

20. Hampton KN, Shin I, Lu W. Social media and political discussion: when online presence silences offline conversation. Information, Communication & Society. 2017 Jul 3;20(7):1090-107.

21. Kalu KN. Political Culture, Change, and Security Policy in Nigeria. Routledge; 2018 Mar 15.

22. Alexander AC, Parhizkari S. A multilevel study of gender egalitarian values across Muslim-majority provinces: the role of women and urban spaces. International Review of Sociology. 2018 Sep 2;28(3):474-91.

23. Ratner C, El-Badwi ES. A cultural psychological theory of mental illness, supported by research in Saudi Arabia. Journal of Social Distress and the Homeless. 2011 Dec 1;20(3-4):217-74.

24. Dhami S, Sheikh A. The Muslim family: predicament and promise. Western Journal of Medicine. 2000 Nov;173(5):352.

25. Bott E, Spillius EB. Family and social network: Roles, norms and external relationships in ordinary urban families. Routledge; 2014 Feb 25.

26. Robinson L, Gemski A, Abley C, Bond J, Keady J, Campbell S, Samsi K, Manthorpe J. The transition to dementia–individual and family experiences of receiving a diagnosis: a review. International Psychogeriatrics. 2011 Sep;23(7):1026-43.

27. Aljuaid M, Mannan F, Chaudhry Z, Rawaf S, Majeed A. Quality of care in university hospitals in Saudi Arabia: a systematic review. BMJ open. 2016 Feb 1;6(2):e008988.

28. Alosaimi DN, Ahmad MM. The challenges of cultural competency among expatriate nurses working in Kingdom of Saudi Arabia. Research and theory for Nursing Practice. 2016 Jan 1;30(4):302-19.

29. Abdulghani HM, Alrowais NA, Alhaqwi AI, Alrasheedi A, Al-Zahir M, Al-Madani A, Al-Eissa A, Al-Hakmi B, Takroni R, Ahmad F. Cigarette smoking among female students in five medical and nonmedical colleges. International journal of general medicine. 2013;6:719.

30. Abu-Amero KK, González AM, Larruga JM, Bosley TM, Cabrera VM. Eurasian and African mitochondrial DNA influences in the Saudi Arabian population. BMC evolutionary biology. 2007 Dec;7(1):1-5.

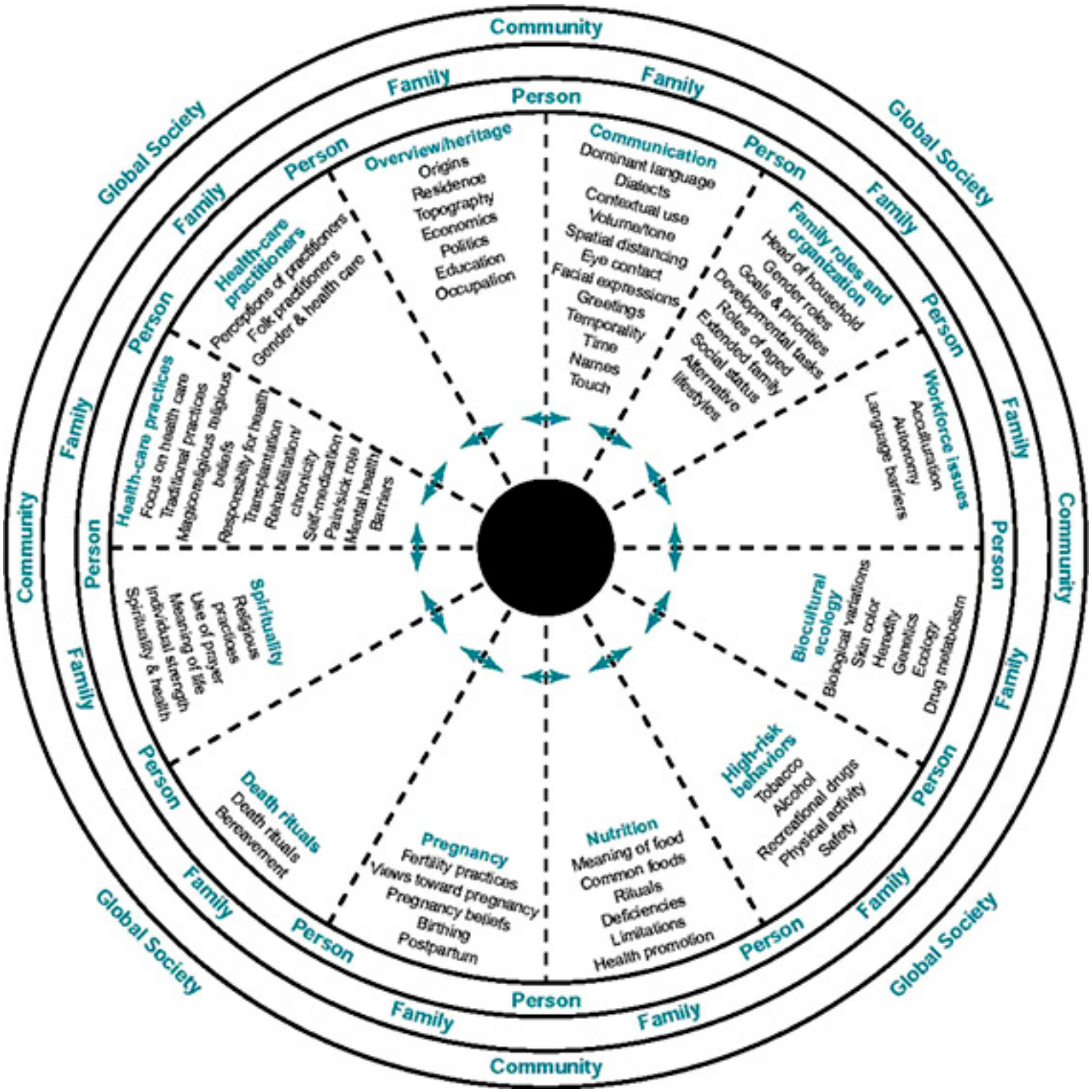
31.Al-Gazali L, Hamamy H, Al-Arrayad S. Genetic disorders in the Arab world. Bmj. 2006 Oct 19;333(7573):831-4.

32. Harris B, Birnbaum R. Ethical and legal implications on the use of technology in counselling. Clinical Social Work Journal. 2015 Jun;43(2):133-41.

33. Al-Owain M, Al-Zaidan H, Al-Hassnan Z. Map of autosomal recessive genetic disorders in Saudi Arabia: concepts and future directions. American Journal of Medical Genetics Part A. 2012 Oct;158(10):2629-40.

34. Amin TT, Amr MA, Zaza BO, Suleman W. Harm perception, attitudes and predictors of waterpipe (shisha) smoking among secondary school adolescents in Al-Hassa, Saudi Arabia. Asian Pac J Cancer Prev. 2010 Jan 1;11(2):293-301.
35. Al-Haqwi AI. Perception among medical students in Riyadh, Saudi Arabia, regarding alcohol and substance abuse in the community: a cross-sectional survey. Substance abuse treatment, prevention, and policy. 2010 Dec;5(1):1-6.
36. Ginawi IA. Perception on the relationship between cancer and usage of tobacco and alcohol in hail, Saudi Arabia. Journal of Clinical and Diagnostic Research: JCDR. 2013 Oct;7(10):2197.
37. Fageeh WM. Sexual behavior and knowledge of human immunodeficiency virus/aids and sexually transmitted infections among women inmates of Briman Prison, Jeddah, Saudi Arabia. BMC Infectious Diseases. 2014 Dec;14(1):1-7.
38. World Health Organization. Global status report on alcohol and health 2018. World Health Organization; 2019 Feb 14.
39. Kar D, Spanjers J. Transnational crime and the developing world. Global Financial Integrity. Washington. 2017 Mar:53-9.
40. Nichols W, Kravitz M. Soldiers of Abu Hilalain. 2015.
41. Ageely HM. Prevalence of Khat chewing in college and secondary (high) school students of Jazan region, Saudi Arabia. Harm Reduction Journal. 2009 Dec;6(1):1-7.
42. Mansuri FA, Al-Zalabani AH, Zalat MM, Qabshawi RI. Road safety and road traffic accidents in Saudi Arabia: A systematic review of existing evidence. Saudi medical journal. 2015;36(4):418.
43. Abdullah WA, Al-Mutairi K, Al-Ali Y, Al-Soghier A, Al-Shnwani A. Patterns and etiology of maxillofacial fractures in Riyadh City, Saudi Arabia. The Saudi Dental Journal. 2013 Jan 1;25(1):33-8.
44. Gardas B, Raut R, Jagtap AH, Narkhede B. Exploring the key performance indicators of green supply chain management in agro-industry. Journal of modelling in management. 2019 Feb 11.
45. Yamane D. Journal: Handbooks of Sociology and Social Research Handbook of Religion and Society, 2016, p. 67-87. Journal: Handbooks of Sociology and Social Research Handbook of Religion and Society. 2016:67-87.
46. Al-Hazzaa HM, Abahussain NA, Al-Sobayel HI, Qahwaji DM, Musaiger AO. Lifestyle factors associated with overweight and obesity among Saudi adolescents. BMC public health. 2012 Dec;12(1):1-1.
47. Badran M, Laher I. Obesity in Arabic-speaking countries. Journal of obesity. 2011 Aug;2011.
48. Musaiger AO. Overweight and obesity in eastern mediterranean region: prevalence and possible causes. Journal of obesity. 2011 Sep 18;2011.
49. El-Mouzan MI, Al-Herbish AS, Al-Salloum AA, Al-Omar AA, Qurachi MM. Trends in the nutritional status of Saudi children. Saudi medical journal. 2008 Jun 1;29(6):884.
50. Ng SW, Zaghloul S, Ali HI, Harrison G, Popkin BM. The prevalence and trends of overweight, obesity and nutrition-related non-communicable diseases in the Arabian Gulf States. Obesity reviews. 2011 Jan;12(1):1-3.
51. Musaiger AO, Hassan AS, Obeid O. The paradox of nutrition-related diseases in the Arab countries: the need for action. International journal of environmental research and public health. 2011 Sep;8(9):3637-71.
52. Malik M, Bakir A. Prevalence of overweight and obesity among children in the United Arab Emirates. Obesity reviews. 2007 Jan;8(1):15-20.
53. Al Alwan İ, Al Fattani A, Longford N. The effect of parental socioeconomic class on children's body mass indices. Journal of clinical research in pediatric endocrinology. 2013 Jun;5(2):110.
54. Tobin SA. Jordan's Arab Spring: The middle class and anti-revolution. Middle East Policy. 2012 Mar 1;19(1):96-109.
55. Al Sheeha M. Awareness and use of contraceptives among Saudi women attending primary care centers in Al-qassim, Saudi Arabia. International journal of health sciences. 2010 Jan;4(1):11.
56. Abdel-Fattah M, Hifnawy T, El Said TI, Moharam MM, Mahmoud MA. Determinants of birth spacing among Saudi women. Journal of family & community medicine. 2007 Sep;14(3):103.
57. Mani ZA, Ibrahim MA. Intensive care unit nurses' perceptions of the obstacles to the end of life care in Saudi Arabia. Saudi medical journal. 2017 Jul;38(7):715.
58. Al-Amri AM. Future S audi doctors and cancer patients agree cancer patients should be informed about their cancer. Asia-Pacific Journal of Clinical Oncology. 2013 Dec;9(4):342-8.
59. Al-Mohaimeed AA, Sharaf FK. Breaking bad news issues: a survey among physicians. Oman medical journal. 2013 Jan;28(1):20.
60. O'brien ME. Spirituality in nursing: Standing on holy ground. Jones & Bartlett Learning; 2021 Feb 9.
61. Al-Eisa ES, Al-Sobayel HI. Physical activity and health beliefs among Saudi women. Journal of nutrition and metabolism. 2012 Feb 22;2012.
62. Al-Rowais N, Al-Faris E, Mohammad AG, Al-Rukban M, Abdulghani HM. Traditional healers in Riyadh region: reasons and health problems for seeking their advice. A household survey. The Journal of Alternative and Complementary Medicine. 2010 Feb 1;16(2):199-204.
63. Alqahtani MM, Salmon P. Cultural influences in the aetiological beliefs of Saudi Arabian primary care patients about their symptoms: the association of religious and psychological beliefs. Journal of religion and health. 2008 Sep;47(3):302-13.
64.Halligan P. Caring for patients of Islamic denomination: critical care nurses' experiences in Saudi Arabia. Journal of clinical nursing. 2006 Dec;15(12):1565-73.
65. Al-Mutair AS, Plummer V, Clerehan R, O'Brien A. Families' needs of critical care Muslim patients in Saudi Arabia: a quantitative study. Nursing in Critical Care. 2014 Jul;19(4):185-95.
66. American Nurses Association. The nurse's role in ethics and human rights: Protecting and promoting individual worth, dignity, and human rights in practice settings. Silver Spring, MD: Nursebooks. org. 2010.
67. Galanti GA. Caring for patients from different cultures. University of Pennsylvania Press; 2004.

Appendix A: The Purnell model for cultural competence:



A mixed-method study examining family physicians' perceptions regarding insulin pump therapy

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Abstract

Background: Primary health care (PHC) physicians lack sufficient knowledge about insulin pump therapy.

Objectives: to assess the level of knowledge and attitude of PHC physicians toward Insulin Pumps.

Methods: A cross-sectional study was done on PHC physicians working in primary healthcare settings at the main University Hospital and at the medical services centers at King Abdulaziz University, Jeddah, Saudi Arabia. Data about participants' demographics, experience, specialty, workplace, and current position were collected. Their knowledge and attitude toward insulin pump therapy were assessed through online Google Forms. A qualitative part of the study was done by interviewing six physicians to report their opinion about insulin pumps therapy.

Results: There was a lack of understanding of the function of an insulin pump and the elimination of the usage of finger sticks, however most of them were aware of the different types of insulin dosages and the appropriate age group for insulin pump therapy. The majority of the participants had a favorable attitude toward insulin pump therapy, as evidenced by the qualitative and quantitative findings of the study. Physicians who were 30 to 49 years old, consultants, and those with 10 to 19 years of experience all scored much better on knowledge. Knowledge deficits, a hazy system, financial concerns, the lack of pumps, and the lack of a skilled physician were all barriers to initiating patients on insulin pump therapy.

Conclusions: There is a need for training programmes to increase PHC understanding and attitudes about insulin pump therapy.

Keywords: knowledge, attitude, insulin, pumps, PHC, Jeddah

Introduction

Diabetes mellitus (DM) is defined as a metabolic disorder that results from disturbances in insulin secretion, action, or both, and leads to chronic hyperglycemia with defects in carbohydrate, lipid, and protein metabolism, as defined by the World Health Organization (WHO) (1). The worldwide DM prevalence in 2014 was 9% in males and 7.9% in females, and this prevalence has nearly doubled since the 1980s when it was 4.3% in males and 5% in females (2). The prevalence of DM in Saudi Arabia has recently been ranked the second-highest in the Middle East region, and seventh highest worldwide, with approximately 7 million (21.8%) having DM and almost 3 million (9.3%) having pre-diabetes (3).

There have been recent advances in the management of DM, especially for patients on insulin therapy. Significant strides have also been made in glucose monitoring technology and insulin delivery methods (4). Continuous subcutaneous insulin infusion (CSSI) system also known as insulin pump is one of the favored insulin delivery methods which was first used in the late 1970s and this technology has progressed over the years to now mimic physiological insulin secretion, behaving as an artificial pancreas (5, 6).

Despite all these advances with proven benefits, the average glycosylated hemoglobin (HbA1C) among type 1 diabetic patients has worsened from 2012 to 2018 (7). This worsening might be the result of the underutilization of available methods and technology (8).

Limited data is available on the knowledge and attitude of physicians towards the use of CSSI. Locally there was a cross-sectional study that included physicians from different Saudi regions who worked in hospitals with a total number of 307 participants. The study found that there WAS a significant lack of knowledge among physicians regarding insulin pump therapy. However, the perceived attitude of physicians toward this therapy was deemed positive (4).

With the increasing use of insulin pump therapy, family and primary health care physicians will need to deal more often with diabetic patients who use insulin pumps in outpatient and urgent care clinic settings where this lack of knowledge regarding CSII is bound to affect patients' safety and clinical outcome. To the best of our knowledge, the evaluation of knowledge and attitude toward Insulin Pumps among Primary Health Care Physicians has not been conducted before.

This study aimed to assess the level of knowledge and attitude of primary health care physicians toward Insulin Pumps.

Subjects and methods

This study was a cross-sectional study that was conducted between March 1, 2021, and February 1, 2022, at King Abdulaziz University (KAU), Jeddah, Saudi Arabia. Jeddah is the largest city in the western region of Saudi Arabia with a population of around 3.4 million (9).

Participants included Saudi and non-Saudi physicians working in primary healthcare settings at the main University Hospital and at the medical services centers at King Abdulaziz University. The targeted population of this study included practicing Physicians in the PHC setting at various levels, such as consultants, specialists/registrars, residents, and general practitioners. The total sampling technique was used in this study. The total number of participating physicians was 90.

For the survey in this study, we repurposed a questionnaire with permission from another study that was published in the International Journal of Environmental Research and Public Health based on the American Diabetes Association and the National Institute for Health and Care Excellence (4). The survey was tested using a pilot study before it was distributed to participants. We designed a Google form containing the survey and distributed it through the WhatsApp® application.

Abbreviations:

PHC	Primary Health Care
DM	Diabetes mellitus
WHO	World Health Organization
CSSI	Continuous subcutaneous insulin infusion
HbA1C	Glycosylated Hemoglobin
KAU	King Abdulaziz University
SD	Standard Deviation
AID	Automated insulin administration
HCPs	Health Care Physicians
DIY	Alternative do-it-yourself
KAUH	King Abdulaziz university Hospital
UMCS	University Medical Center services

The questionnaire consisted of 28 questions divided into three sections. The first section included 7 questions on demographic data, age, gender, nationality, professional period, specialty, workplace, and current position. The second section consisted of 7 questions related to the attitude of physicians toward insulin pump therapy technology, such as frequency of dealing with insulin pumps, their opinion about the importance of gaining necessary information, need for an educational program to ensure the safety of dealing with insulin pumps, the impact of insulin pump therapy on patients, criteria for patient selection, and barriers to use of insulin pump therapy. The third section consisted of 14 questions related to the physicians' knowledge on insulin pump therapy. The questions covered the basic information, including pump function, technique, type of insulin commonly used, therapy regimen, patients' eligibility, change of the infusion set, as well as risks in case of insulin pump interruption.
The physicians' knowledge of insulin pump therapy was evaluated as follows. For each of the 28 questions, a score of 1 was assigned for correct answers and a score of 0 for incorrect answers. The total knowledge score was calculated as the sum of all individual scores, ranging from 0 to 28 points, with higher scores indicating greater knowledge regarding insulin pump therapy. Using cutoff points at 50% and 75% of the total score, participants were classified as having poor (0 to12), average (13 to 20), or good knowledge (21–28). For the evaluation of attitude regarding insulin pump therapy, scores of 1 to 5 were assigned for the answers to the 7 questions based on a five-point Likert scale ranging from "strongly disagree" (score 1) to "strongly agree" (score 5). The total attitude score was calculated as the sum of all individual scores, ranging from 7 to 35 points, with higher scores indicating a more positive attitude regarding insulin pump therapy. Using cutoff points at 50% and 75% of the total score, participants were classified as having a negative (7 to 17), neutral (18 to 26), or positive attitude (27 to 35).

The data was collected through Google Forms and transferred to an Excel sheet, which was then analyzed by IBM SPSS statistic version 25. AP –value < 0.05 was considered to be significant.

A qualitative part of this study was done by interviewing six physicians to report their opinion about the need for the basic knowledge about insulin pumps, and where should patients go for their insulin pump therapy, criteria for referral and whom to refer to, barriers for starting patients on insulin pump therapy, sources of patient education about insulin pump therapy, frequency of seeing patients in primary care setting for managing insulin pumps and their attitude towards insulin pump therapy.

A pilot study was conducted to test the questionnaire validity on 10% of the population. It was carried out with the application of the full methodology and analysis of results. The method, feasibility, and duration were assessed. Necessary changes were made and described. If this is not possible, at least pretesting of the study tool should be conducted.

Ethical approval was obtained from the Committee of Bioethics at King Abdulaziz University. All participants gave their written informed consent before filling out the survey.

Results

1- Quantitative result

The questionnaire was sent to all primary care physicians at KAU (90) and 83 of them responded (response rate was 90%). The majority of participants were younger than 40 (83.1%) and more females responded (60.2%). Most of them were enrolled in family medicine training programs (91.6%). Residents constituted around two thirds of the physician. (63.9%). The rest of the demographics are shown in Table 1.

The results of the assessment of physicians' knowledge regarding insulin pump therapy are presented in Table 2. Most of the participants failed to choose the correct answers regarding the function of insulin pump and the elimination of finger stick use (q1 and q14), while questions regarding main types of insulin doses and the right age group for insulin pump therapy (q3 and q5) were the most correctly answered questions.

Regarding physicians' attitude toward insulin pump therapy, the vast majority of the physicians stood in the agreement end towards all statements (Tables 3 and 4). However, a noteworthy number of participants were neutral with the statements regarding insulin pump candidates selection and barriers to insulin pump therapy (statements 4 and 5).

When comparing the knowledge and attitude scores based on the socio-demographic characteristics of the participating physicians (Table 5), a one-way ANOVA showed statistically significant difference between age groups and total score of knowledge, $F(82)=3.26$, $p<0.05$. However, LSD post hoc test showed that physicians aged 30-49 years have statistically significantly higher scores than the rest of the sample (post hoc result). Additionally, one-way ANOVA with LSD post hoc showed that Consultants had statistically significant higher knowledge scores than specialists and residents, $F(82)=8.16$, $p<0.05$ and (post hoc result). Moreover, one-way ANOVA with LSD post hoc showed that physicians with 10-19 years of experience had statistically significant higher knowledge scores than the rest of the sample $F(82)=8.16$, $p<0.05$ and (post hoc result).

2- Qualitative results

(Table 6) illustrates the result of the qualitative part of the research that included a personal interview with six physicians. There was agreement from 3 of the studied physicians on the need for the basic knowledge about the criteria of candidate patients, whom to refer, types of pumps and types of insulin used in pumps, interpretations, complications and technology. Of the 6 interviewed physicians, only 2 thought that patients who are on insulin pump should follow up for their insulin pump therapy in primary care clinics. And 2 agreed that primary care

physicians should be involved in sharing care with more specialized physicians. All interviewed physicians didn't have clear criteria for referral and whom to refer, and all reported that knowledge deficit, vague system, financial issues, pumps unavailability, and unavailability of trained physician were significant barriers for starting patients on insulin pump therapy. All physicians stated that currently, the only sources for patient education about insulin pump therapy are endocrinology physicians, diabetologists, pediatricians, and social media. During their clinical practice, only 2 participants reported seeing a single patient in primary care setting for purpose other than managing insulin pumps. All the interviewed participants agreed that only the minority of patients receive pumps in private hospital because it isn't for public patients. And the response of all of them on this statement "are you a fan of insulin pump therapy?" was that they all saw its helpfulness, indicating a good attitude.

Table 1. Sociodemographic characteristics of physicians (n = 83)

Study Variables	N (%)
Age group	
• 20-29	40 (48.2 %)
• 30-39	29 (34.9 %)
• 40-49	7 (8.4 %)
• ≥ 50	7 (8.4 %)
Gender	
• Male	33 (39.8%)
• Female	50 (60.2%)
Specialty	
• Family Medicine	76 (91.6%)
• General practitioner	7 (8.4%)
Position	
• Consultant	17 (20.5%)
• Specialist	13 (15.7%)
• Resident	53 (63.9%)
Workplace	
• KAUH	66 (79.5%)
• UMCS	17 (20.5%)
Nationality	
• Saudi	75 (90.4%)
• Non-Saudi	8 (9.6%)
Years of Experience	
• 0-9	62 (74.7%)
• 10-19	14 (16.9%)
• 20-30	7 (8.4%)

Table 2. Assessment of the knowledge regarding insulin pump therapy (n = 83).

Statement	Correct Answers Aqeel 2020	Correct Answers Alghamdi 2022
1. Function of insulin pump therapy	(9.8%)	(3.6%)
2. Type of insulin used in the pump	(47.6%)	(42.2%)
3. The main type(s) of insulin doses in the pump	(57.3%)*	(75.9%)*
4. Insulin pump therapy is recommended for which type of diabetic patient	(14.0%)	(20.5%)
5. Insulin pump therapy can be used for which age group	(87.0%)**	(94%)**
6. Mechanism of loading insulin pump by the patient	(46.6%)	(37.3%)
7. The frequency of changing infusion set of insulin pump, who is responsible for this action.	(39.4%)	(31.3%)
8. The best candidate for insulin pump therapy	(53.7%)	(54.2%)
9. Insulin pumps come in different types	(65.5%)*	(41%)*
10. The patient needs to do very well with the new technology to be on insulin pump	(28.7%)	(36.1%)
11. The pump needs to be implanted, and therefore minor surgery is needed	(48.5%)	(34.9%)
12. The pump can be disconnected even for a short time (<1 h).	(47.9%)	(44.6%)
13. Severe hyperglycemia or possibly diabetes ketoacidosis can result from pump discontinuation even for several hours	(53.4%)	(39.8%)
14. The pump (especially if attached to continuous glucose monitoring) eliminates the need for self(finger-stick) glucose monitoring	(28.7%)*	(9.8%)*

*More than 15%
**Highly correct answer

Table 3. Assessment of the attitude toward insulin pump therapy (n = 83).

Statement	SD N (%)	D N (%)	N N (%)	A N (%)	SA N (%)
Physicians should know the basic information and understand primary principles of insulin pump therapy	1(1.2%)	0	7 (8.4%)	29 (34.9%)	46 (55.4%)
Each hospital should have a structured diabetes program (start from assessment & education to determination & initiation, then to outcome evaluation) for patients who are on insulin pump	0	0	8 (9.6%)	33 (39.8%)	42 (50.6%)
Insulin pump therapy promotes the patient emotionally & psychologically to improve the management of their high blood sugar	0	0	9 (10.8%)	39 (47%)	35 (42.2%)
The selection of eligible candidates for insulin pump therapy depends more on the patient motivation and readiness than desires by physicians or family	0	3 (3.6%)	15 (18.1%)	41 (49.4%)	24 (28.9%)
The major barrier to insulin pump therapy is the high cost more than the associated safety issues or adverse effects	0	2 (2.4%)	20 (24.1%)	37 (44.6%)	24 (28.9%)
Educational programs for diabetic patients about the benefits & risk of insulin pump	0	0	7 (8.4%)	37 (44.6%)	39 (47%)

SD—Strongly Disagree; D—Disagree; N—Neutral; A—Agree; SA—Strongly Agree.

Table 4. Mean and standard deviation of physicians' responses to questionnaire items

Statement	M (SD)	t-test (p)
Physicians should know the basic information and understand primary principles of insulin pump therapy	4.43 (0.75)	17.36 (0.00)
Each hospital should have a structured diabetes program (start from assessment & education to determination & initiation, then to outcome evaluation) for patients who are on insulin pump	4.41 (0.66)	19.36 (0.00)
Insulin pump therapy promotes the patient emotionally & psychologically to improve the management of their high blood sugar	4.31 (0.66)	18.10 (0.00)
The selection of eligible candidates for insulin pump therapy depends more on the patient motivation and readiness than desires of physicians or family	4.03 (0.78)	11.98 (0.00)
The major barrier to insulin pump therapy is the high cost more than the associated safety issues or adverse effects	4.00 (0.79)	1.44 (0.00)
Educational programs for diabetic patients about the benefits & risk of insulin pump	4.38 (0.64)	19.70 (0.00)

Table 5. Comparison of the mean knowledge and attitude scores according to the physicians' sociodemographic characteristics (n = 83).

Factor	Knowledge		Attitude	
	Score (14) Mean ± SD	p-Value	Score (30) Mean ± SD	p-Value
Age group				
20-29	4.98 ± 1.93		25.58 ± 2.33	
30-39	6.21 ± 2.47		25.38 ± 2.80	
40-49	7.43 ± 2.94		26.43 ± 2.15	
≥ 50	5.43 ± 2.37	$p < 0.026$**	25.57 ± 2.99	$P > 0.81$
Gender				
Male	5.54 ± 2.26		25.24 ± 2.62	
Female	5.72 ± 2.41	$P > 0.742$	25.80 ± 2.44	$P > 0.33$
Specialty				
Family Medicine	5.74 ± 2.40		25.54 ± 2.53	
General practitioner	4.71 ± 1.38	$P > 0.27$	26.00 ± 2.52	$P > 0.646$
Position				
Consultant	7.47 ± 2.76		25.65 ± 2.98	
Specialist	5.77 ± 1.88	$p < 0.001$**	26.00 ± 2.31	$P > 0.78$
Resident	5.04 ± 2.01		25.45 ± 2.44	
Workplace				
KAUH	5.74 ± 2.52		25.50 ± 2.54	
UMCS	5.29 ± 1.49	$P > 0.35$	25.88 ± 2.45	$P > 0.35$
Nationality				
Saudi	5.72 ± 2.42		25.48 ± 2.56	
Non-Saudi	5.00 ± 1.31	$P > 0.41$	26.50 ± 1.85	$P > 0.58$
Years of Experience				
0-9	5.23 ± 1.95		25.48 ± 2.47	
10-19	8.07 ± 2.87		25.43 ± 2.79	
20-30	4.57 ± 1.27	$p < 0.000$**	26.71 ± 2.43	$P > 0.46$

Table 6. Qualitative results of physicians' interview (No.:6)

Question 1	How much do you think primary care physicians should know about insulin pump therapy?	
Thames	Some Agreed to know basic knowledge in form of: 1. Criteria of candidate patients 2. Whom to refer	Some Agreed to know basic knowledge in form of: 1. Criteria of candidate patients 2. Whom to refer 3. Types of pumps 4. Types of insulin used in pumps 5. Interpretations 6. Complications 7. Technology
Participants	P1, P3 and P5	P2, P4 and P6
Question2	Do you think patient who are on insulin pump should follow up for their insulin pump therapy in primary care clinics?	
Thames	Some Agreed that patients should be followed at primary care clinics	Some Disagreed that patients should be followed at primary care clinics
Participants	P2 and P6	P1, P3, P4 and P5
Question 3	Should you as a primary care physician be involved in managing patients on insulin pumps	
Thames	Some Agreed that primary care physicians be involved in sharing care with more specialized physicians	Some Disagreed that primary care physicians be involved
Participants	P2 and P6	P1, P3, P4 and P5
Question 4	What factors should you depend on in patient selection for insulin therapy? Do you have a clear criterion for referral and to whom?	
Thames	All the participants don't have a clear criteria for referral and whom to refer	
Participants	P1, P2, P3, P4, P5 and P6	
Question 5	What do you think are the barriers for starting patients on insulin pump therapy?	
Thames	All the participants agreed on the following barriers: 1- Knowledge deficit 2- A vague system 3- Financial issues 4- Pumps availability 5- Availability of trained physicians	
Participants	P1, P2, P3, P4, P5 and P6	
Question 6	Currently, how are patients educated about insulin pump therapy?	
Thames	All the participants agreed that the only sources for patient educations are: 1- Endocrinology physicians 2- Diabetologist 3- Pediatricians 4- Social media	
Participants	P1, P2, P3, P4, P5 and P6	
Question7	How often do you see patients on insulin pumps therapy?	
Thames	Two participants reported seeing a single patient in primary care setting for purpose other than managing insulin pumps	All other participants have never seen patient on insulin pumps
Participants	P2 and P4	P1, P3, P5 and P6

Table 6. Qualitative results of physicians' interview (No.:6) (continued)

Question 8	In our survey the result showed that you rarely see patients on insulin pump. Why do you think that is?	
Thames	They all agreed that only the minority of patients receive pumps in private hospital because it isn't for public patients.	
Participants	P1, P2, P3, P4, P5 and P6	
Question 9	Are you a fan of insulin pump therapy?	
Thames	All agreed on its helpfulness	
Participants	P1, P2, P3, P4, P5 and P6	
Question 10	Do you think your patients are ready for pump?	
Thames	One participant said no	All other participant reported don't know
Participants	P1	P2, P3, P4, P5 and P6

Discussion

In our study, we evaluated the knowledge and attitude of primary health care physicians at King Abdulaziz University toward insulin pump therapy.

Our findings showed that physicians have a significant deficit of knowledge about insulin pump therapy as most of them gave the wrong answer regarding the function of insulin pump and the elimination of finger stick use. On the other hand, the studied physicians had a positive attitude toward this therapy.

Despite the fact that clinical trials, research, and patient experience have all proved the value of AID, it is still out of reach for many patients. Alternative do-it-yourself (DIY) solutions to off-the-shelf AID devices have emerged as a result of patient-driven innovation (10).

According to a recent study, the largest obstacle to answering patient concerns about what is accessible is HCPs' lack of awareness about how Automated insulin administration (AID) works (74.4 percent). In addition, 64.5 percent of HCPs said they were "likely" or "very likely" to use the fact sheet when responding to patient inquiries about AID alternatives (10). Increased awareness and use of AID technology, according to this study, offer optimism for further reducing the burden of diabetes, but there is a need to close the knowledge gap about DIY AID (10).

Insulin pump mismanagement among diabetic patients could be caused by a lack of basic awareness among primary healthcare providers about insulin pumps (11). According to Grunberger et al. (11) effective implementation of IP is largely based on the skills, knowledge, and resources needed to use this type of insulin therapy in a way that is both effective and does not put participants in danger. This necessitates meticulous selection of both professionals and patients.

Many studies have been undertaken to examine physicians' knowledge and attitudes concerning insulin pumps, but none of them have focused on primary care physicians, so we only included primary care physicians from one of the country's largest and most specialized medical centers.

Only two Saudi studies have been conducted on the subject. One of these investigations was conducted in 2020 by Alaqeel et al and involved primary health care physicians. The study looked at physicians' attitudes and expertise about insulin pump therapy in Saudi Arabia. This study comprised 307 physicians, including 82 family physicians. According to the survey, 56.7 percent had insufficient knowledge and 53.4 percent had a good attitude, which is similar to our findings (4).

The other Saudi study looked at the degree of knowledge and attitudes towards insulin pump therapy among healthcare providers in Riyadh. The majority of respondents (80%) were unaware of the basic components of an insulin pump, and a further 79 percent were unaware that an insulin pump can be loaded with insulin by the patients themselves based on their needs. However, the physicians polled had a positive outlook on insulin pumps, with nearly 73 percent believing that knowing the basics and understanding the basic principles of insulin pump therapy is critical, and 50.7 percent believing that insulin pump therapy benefits patients emotionally and psychologically and can help with uncontrolled blood glucose management (4).

Participants with a higher age had significantly higher knowledge ratings, according to the current study. Furthermore, consultants and physicians with 10 to 19 years of experience scored statistically significantly higher on knowledge. Knowledge was influenced by older age and years of practice in the Alaqeel study, which is similar to our findings (4). This can be explained by the fact that these doctors have more expertise, have had greater exposure to more patients, and thus have had more opportunities to learn about insulin pumps and how they affect patients. Furthermore, they are more up to speed on the latest research and medical literature on diabetes therapy (4).

There were few negative sentiments concerning the usage of DIY AID. The majority of HCPs believe that their lack of understanding of how AIDs work is the most significant impediment to answering patient questions regarding what is available (74.4 percent). In addition, 64.5 percent of HCPs said they were "likely" or "very likely" to use the fact sheet when responding to patient inquiries about AID alternatives (10).

Less training and exposure to insulin pumps could explain the poor level of knowledge observed in this investigation. Endocrinologists had the highest degree of knowledge in the Alaqeel study, which is likely due to the fact that they keep up to date on such devices by attending conferences and are the target audience for insulin pump manufacturers' advertising and sales campaigns. Furthermore, endocrinologists have a better level of diabetes knowledge. Because managing an insulin pump by a physician with insufficient knowledge can lead to serious complications such as diabetic ketoacidosis or severe hypoglycemia, it is a requirement that physicians responsible for these patients' care have experience with insulin pumps in order to ensure the patients' safety and well-being (12). Moreover, unqualified physicians may refuse to prescribe an insulin pump to patients who may benefit from it (12).

\As in the qualitative part of our study nearly all the participants agreed on 'we should know basic knowledge in form of clear referral criteria and whom to refer to', so when we see our survey in the quantitative part as per questions 1,4,5,7 and 8 on (table 2) they poorly answered these questions which means that we need to increase the physicians' knowledge toward insulin pump therapy.

The use of insulin pump (IP) in Saudi Arabia is currently somewhat low, and there is limited indication regarding their effect on glycaemic control and diabetes treatment satisfaction (13). Overall, most of our participants showed a positive attitude toward insulin pumps. Due to the scarcity of studies on this topic, we speculated that this finding is also important as it showed the agreement between knowledge and attitude, which could be the basis for future investigations.

All the interviewed physicians in the qualitative part of the research admitted that knowledge deficit, vague system, financial issues, pumps unavailability, and unavailability of trained physicians were significant barriers for starting patients on insulin pump therapy. In a prior study, half of the physicians reported to having insufficient consultation periods and appointment frequency to allow for insulin therapy escalation. HbA1c values were unavailable to 40% of PCPs in order to inform their management recommendations (14). One of the greatest challenges, according to another study, is a lack of resources within the healthcare team to promote device use (15).

The number of IP users among Saudi youth is still low, according to Bin Abbas et al. (16). He claims that a lack of patient/family motivation, health-care team enthusiasm, and adequate technical support are among the contributing factors. This was explained by the usability of current technology, where attention spans are short and bad encounters are common, affecting more than 40% of users each year, with a minority, notably in youngsters, requiring hospitalization.

Limitations

There are several limitations in our study. It was a cross-sectional study that could reveal the associations between variables without concluding the casual relationships. In addition, the use of a peer-designed questionnaire for data collection could have a recall bias.

Conclusion

This study found a deficient knowledge among studied physicians about the function of insulin pumps and the elimination of finger stick use, while most of them knew types of insulin doses and the right age group for insulin pump therapy. The majority had a positive attitude towards insulin pump therapy that was obvious through results of the qualitative and quantitative parts of the research. Physicians with older age (30-49 years), consultants and those with 10-19 years of experience had statistically significant higher knowledge scores.

The main barriers for starting patients on insulin pump therapy were knowledge deficit, vague system, financial issues, pumps unavailability and the unavailability of trained physicians. It is suggested that the King Abdulaziz University Hospital take suitable efforts to enhance the number of skilled physicians who can treat patients on insulin pump therapy, especially given the rising number of diabetes cases in Saudi Arabia each year. We recommend implementing training programmes focusing on dealing with patients who use insulin pumps in order to improve understanding. Furthermore, because there are few studies on the management of these patients in Saudi Arabia, we urge that future research focus on the challenges that healthcare providers experience when dealing with patients who use insulin pumps.

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References

1. Alberti KGMM, Zimmet PZJDm. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus. Provisional report of a WHO consultation. 1998;15(7):539-553.

2. Zhou B, Lu Y, Hajifathalian K, Bentham J, Di Cesare M, Danaei G, et al. Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4•4 million participants. The Lancet. 2016;387(10027):1513-1530.

3. Batais MA, Alamri AK, Alghammass MA, Alzamil OA, Almutairi BA, Al-Maflehi N, et al. Diabetes and driving recommendations among healthcare providers in Saudi Arabia. A significant gap that requires action. Saudi Med J. 2018;39(4):386-394.

4.Alaqeel A, Almushaigeh A, Almijmaj M, Almesned R, Alsuhaibani M. Are Physicians in Saudi Arabia Ready for Patients with an Insulin Pump? An Examination of Physician Knowledge and Attitude. Int J Environ Res Public Health. 2020 15;17(24):9394.

5. American Diabetes A. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2020. Diabetes Care. 2020;43(Suppl 1):S14-S31.
6. Sherr JL, Tauschmann M, Battelino T, de Bock M, Forlenza G, Roman R, et al. ISPAD Clinical Practice Consensus Guidelines 2018: Diabetes technologies. Pediatr Diabetes. 2018;19 Suppl 27:302-325.
7. Foster NC, Beck RW, Miller KM, Clements MA, Rickels MR, DiMeglio LA, et al. State of Type 1 Diabetes Management and Outcomes from the T1D Exchange in 2016-2018. Diabetes Technol Ther. 2019;21(2):66-72.
8. Marks BE, Waldman G, Reardon K, Terrio S, Kumar A, Stafford DEJ, et al. Improving pediatric endocrinology trainees' knowledge about insulin pumps and continuous glucose monitors with online spaced education: Technology Knowledge Optimization in T1D (TeKnO T1D). Pediatr Diabetes. 2020;21(5):814-823.
9. <census31-prim-05.pdf>.
10. Murray J, F. Clayton M, L. Litchman M. Health Care Provider Knowledge and Perceptions of FDA-Approved and Do-It-Yourself Automated Insulin Delivery. Journal of Diabetes Science and Technology 2020; 14(6):1017-1021.
11. Grunberger G, Abelseth JM, Bailey TS, Bode BW, Handelsman Y, Hellman R, et al. Consensus statement by the American association of clinical endocrinologists/ American college of endocrinology insulin pump management task force', Endocr Pract 2014; 20(5), pp. 463-489.
12. Ross PL, Milburn J, Reith DM, Wiltshire E, Wheeler BJ. Clinical review: Insulin pump-associated adverse events in adults and children. Acta Diabetol 2015;52, 1017–1024.
13. Al Hayek AA, Robert AA, Al Dawish MA, Braham RB, Goudeh HS, Al Sabaan F S. Efficacy of Insulin Pump Therapy on Diabetes Treatment Satisfaction and Glycemic Control Among Patients with Type 1 Diabetes Mellitus in Saudi Arabia: A Prospective Study', Diabetes Therapy 2015; 6(2), pp. 227-236.
14. Motilal S. Physician related barriers towards insulin therapy at primary care centres in Trinidad: a cross-sectional study. BMC Fam Pract 21, 197 (2020); 21:197-205.
15. Pauley ME, Berget C, Messer LH, Forlenza GP. Barriers to Uptake of Insulin Technologies and Novel Solutions. Med Devices (Auckl) 2021 12;14:339-354.
16-Bin-Abbas BS, Sakati NA, Raef H, Al-Ashwal AA. Continuous subcutaneous insulin infusion in type 1 diabetic Saudi children. A comparison with conventional insulin therapy', Saudi Med J 2005; 26(6):918-922.

Associations between age and types of presentation of refractive errors in children and young adults 0-30 years attending specialist referral hospital in Yemen: a cross-sectional study

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Abstract

Background: Refractive errors are the most common cause of visual impairment worldwide. Proportion of age group is varied among societies and they are considered as a public health challenge and common presentations in general practice in eye clinics. Understanding the associations between age and types of presentation of refractive errors in children and young adults 0-30 years, will aid early identification, diagnosis, referral and treatment.

Aim: The aim of this study was to determine the associations between age and types of presentation of refractive errors in children and young adults, 0-30 years.

Methodology: A cross-sectional study of 1,500 outpatients aged from 0–30 years attending ophthalmology clinic in Sanaa, Yemen (between 2012-2015) were included in the study. All patients underwent visual acuity examination, auto-refractometer, anterior and posterior segment examination, and were grouped according to age and type, i.e., myopia, hyperopia, and astigmatism. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated to evaluate the association between age and types of presentation of refractive errors.

Results: Hyperopia was the most common single diagnosis (53.3%) followed by myopia (33.3%). Astigmatism was uncommon as a single diagnosis (13.4%) but commonly associated with hyperopia or myopia. Myopia was more common in males (42.9%), than females (25%). Hyperopia was more in females (62.5%) than males (42.9%). Age groups most affected by refractive errors were 13-18 years (27.7%), 19-24 years (24.8%) and 25-30 years (24.6%) respectively.

Conclusions: This study highlights the close associations between age and types of presentation of refractive error. Early identification and proper categorization of refractive errors by age, gender, and other demographics by general physicians in primary care can better deduce and make useful referrals to eye specialists.

Keywords: Association, age, myopia, hyperopia, astigmatism, Yemen

Introduction

The number of people globally with refractive errors has been estimated at one to two billion (1). Rates vary between regions of the world with about 25% of Europeans and 80% of Asians affected (1). Refractive error is a problem with focusing light accurately on the retina due to the shape of the eye. The most common types of refractive error are near-sightedness (myopia), far-sightedness (hyperopia), astigmatism, and presbyopia. Near-sightedness results in faraway objects being blurry, far-sightedness and presbyopia result in close objects being blurry, and astigmatism causes objects to appear stretched out or blurry. Other symptoms may include double vision, headaches, and eye strain. Refractive errors are corrected with eyeglasses, contact lenses, or surgery(2). Myopia is the most common disorder (3). Rates among adults are between 15-49% while rates among children are between 1.2-42% (4). Hyperopia more commonly affects young children and the elderly (5, 6). Presbyopia affects most people over the age of 35 (1). In 2013, 660 million people (10 per 100) were estimated with refractive errors that have not been corrected. Of these 9.5 million were blind due to the refractive error(7). Refractive error is one of the most common causes of blindness along with cataracts, macular degeneration and vitamin A deficiency (8).

Myopia is a global public health problem affecting all age groups. A few epidemiological studies have shown variations within and between countries (9). For instance, in studies in Asian countries, prevalence in adults varies between 19.4% in Taiwan (10) to 48.1% in Indonesia (11). In North America and Europe, prevalence varies from 33.1% in the USA (12) to as high as 49% among 40 years+ old adults in the United Kingdom(12). Worldwide variations of myopia in children also show similar differences across countries and regions as shown from the results of the Refractive Error Study in Children (13) which was conducted in different countries using the same sampling strategies and procedures to measure refraction, and similar definitions of myopia to enable inter-country comparisons (13). The study found differences between urban and rural children in Nepal with a progressive increase in prevalence from 5–15 years. In India, prevalence appeared to decrease from rural to urban children whereas among urban children in China, prevalence of myopia varied from 5.7% in 5-year olds, to 30.1% in 10-year-olds, to 78.4% in 15-year-olds (14, 15). According to the WHO regions, the estimated pool prevalence (EPP) of hyperopia was 4.6% (95% CI: 3.9e5.2) in children. The lowest and highest EPP was seen in South-East Asia (2.2%, 95% CI: 1.2e3.3) and the Americas (14.3%, 95% CI: 13.4e15.2), respectively. The EPP of hyperopia was 30.6% (95% CI: 26.1e35.2) in adults. Based on the results of meta-analysis, Africa had the highest EPP of hyperopia (38.6%, 95% CI: 22.4e54.8) followed by the Americas (37.2%, 95% CI: 25.3e49) while Europe had the lowest EPP (23.1%, 95% CI: 6.1e40.2)(16).

The definition of astigmatism in epidemiologic studies has less variation. Considering the changes of astigmatism with age, in children above 1 year old astigmatism was 14.9% (95% CI: 12.7e17.1). According to WHO regions, the lowest estimated pool prevalence (EPP) was seen in South-East Asia (9.8%) while the highest EPP was seen in the Americas (27.2%) followed by the Eastern Mediterranean region (20.4%). For adults, studies showed that 40.4% (95% CI: 34.3e46.6) of adults had astigmatism. However, astigmatism showed a lot of variation in different WHO regions; the highest EPP astigmatism was seen in the America s, and the lowest EPP was seen in Africa (11.4% vs. 45.6). However, it should be noted only one study was conducted in the Americas . After the Americas, South-East Asia had the highest EPP of astigmatism (44.8%, 95% CI: 36.6e53.1)(16).

Given how common these eye defects are in clinical practice, research that helps to understand their natural history and especially local risk factors will be helpful for early diagnosis and properly targeted treatments in primary care practice. Therefore, the focus of this study was to determine the associations between age and types of presentation of refractive errors in children and young adults 0-30 years to aid early identification, diagnosis, referral, and treatment.

Methods

Study design and setting

This was a cross-sectional clinical epidemiological study involving a convenient purposive sample of patients referred from across the country for ophthalmic consultation at the department of ophthalmology, Saudi–German Hospital, a major referral center for eye problems in Sanaa, Yemen. During the study period, all patients with eye problems are referred to Saudi-German Hospital due to the limited facilities across the health centers in Yemen.

Participants

This was a purposive sample whose selection was based on their willingness to participate in the study once they met the inclusion criteria. Given that our primary goal was to determine the types and presentation of refractive errors in our practice population, no specific sample size was calculated. No other similar studies have been reported from the area on this topic.

Sample size and categorization

A total of 1500 patients between age 0-30 years were included in this study after informed consent. Subjects were divided into the following age groups (0-6), (7-12), (13-18), (19-25) and (26-30) in order to include maximum patients who agreed to participate in the study. We identified the patients who can benefit from vision rehabilitation, then accurately measured visual acuity and provided appropriate vision rehabilitation services. Eligibility included referral for ophthalmic consultation by other clinicians for symptoms including decreased vision, headaches, esotropia and exotropia. Patients, with a history of eye injury, aphakia retinoblastoma and systemic or congenital disease were excluded from the study.

Data sources/measurement

Procedures: Demographic data was obtained from patients' records and / or referral notes. All patients underwent visual acuity assessment and refraction measurement by cycloplegic autorefraction and subjective refraction.

Visual Acuity Testing was performed with tumbling E, at a distance of 6 m. The right eye was tested first and then the left, each time with occlusion of the fellow eye. Ocular Examinations were done by a trained team consisting of an ophthalmologist, after assessment of visual acuity as above, axial length was measured by an IOL Master (version 5.02; Carl Zeiss, Jena, Germany), and a slit lamp (YZ5X; 66 Vision Tech, Suzhou, China) examination and direct ophthalmoscopy were performed by an ophthalmologist. Intraocular pressure was measured by an optometrist using noncontact tonometry (NT-1000; Nidek, Tokyo, Japan), and participants having a peripheral anterior chamber depth of >1/2 the thickness of cornea, IOP 25 mm Hg, given cycloplegia of one drop of 0.5% proparacaine hydrochloride in each eye followed by two drops of cyclopentolate 1.0% (Cyclogyl; Alcon, Fort Worth, TX, USA) 5 minutes apart. If the pupil size was ‡6 mm and the light reflex was absent after 30 minutes, cycloplegia was deemed adequate. Subsequently, autorefraction (KR-8900; Topcon, Tokyo, Japan) and subjective refraction were performed by an experienced optometrist.

A value of 6/6 or 20/20 is considered optimum, or perfect vision. Individuals who have 20/20 vision can read letters that are 3/8 of an inch tall from 20 feet away. Those who don't have 20/20 vision, are considered as refractive error. People who require spherical equivalent (SE) ≤ −0.50 Diopters of optical correction are considered as having myopia, SE ≥+2.0 Diopters are considered having hyperopia and SE of -2.00 +3.50 x 095 Diopters are considered as having astigmatism. Once examined, patients were grouped into the following five categories: myopia only; hyperopia only; astigmatism only; myopia with astigmatism; hyperopia with astigmatism

Data collation and analysis

Data was collated and analysed in an Excel database. Subjects were grouped according to age, gender, presenting symptoms and diagnosis based on the five categories identified. Descriptive statistics for categorical data included frequencies (percentages). Inferential statistics were used to make comparisons between error type, frequency of occurrence and gender difference.

Statistical Analysis

The primary goal of these analyses was to determine types and presentation of refractive errors and their possible association with gender and age as a basis for future predictions in Yemeni children and young adults especially in general practice in primary care. All analyses were performed in Microsoft Excel and an alpha level of 0.05 was considered statistically significant. Descriptive statistics of quantitative data are presented as proportions (percentages). Categorical data e.g. age group, gender, and presenting symptoms are also presented as proportions (percentages).

Results

Out of 1500 patients, 700 were males (46.7%) and 800 females (53.3%). Hyperopia was the most common single diagnosis (53.3%) followed by myopia (33.3%). Astigmatism was uncommon as a single diagnosis (13.4%) but commonly associated with hyperopia or myopia. Myopia was more common in males (42.9%) than females (25%). Hyperopia was more in females (62.5%) than males (42.9%) (Table 1). Age groups most affected by refractive errors were 13-18 years (27.7%), 19-24 years (24.8%) and 25-30 years (24.6%) respectively. Decreased vision (53%) was a common presentation in myopia, in astigmatism (41.5%) and less in hyperopia (39.6%). Headache was common in astigmatism (56%), in hyperopia (28.8%) and in myopia (17.8%). Muscle imbalance namely exotropia (27.2%) is mainly found in myopia and esotropia (24.3%) in hyperopia (Table 1 and 2).

Myopia was diagnosed in 500 patients and occurred in all age groups from 0–30 years but was more common in males (42.9%), compared to females (25%). There was also a progressive increase in frequency of myopia with age from 0 – 6 years (28%) to 25 – 30 years (47.3%) (Table 1).

In contrast, hyperopia was more common among patients, 800 cases with a female preponderance (M=42.9 %; F=62.5%). In terms of age distribution, all age groups 0–30 years were affected but was highest in the 13– 18 year group (67.8%) followed by the 19 – 24 year group (45.7%) (Table 1).

Astigmatism was diagnosed in 200 patients with an increased distribution in males (14.3%) and females (12.5%). No cases of astigmatism were found in the 0-6-year-old group. It was much higher in the age group 19-24-years group (18%) compared to the other groups (Table 1).

In terms of presentation, decreased vision (53%) was a major complaint in patients with myopia with a progressive increase in frequency from age 0 – 6 years from (48.6%) to (57.2%) in the 25– 30 years group. A similar trend was found in hyperopia but starting from a higher frequency of (33.3%) in 0 – 6 years with a plateau of around (47.9%) in age group 25 – 30 years. In astigmatism, decreased vision was not found in the 0 – 6-year group and was less common before the age of 13 years but was a major complaint in the 25 – 30 year group (45.5%) and followed by 19 – 24 (44.8%) year groups (Table 2).

Headache was reported less in the 7-12-year old (9.2%) group with myopia, increasing in 25-30-year-olds (23.4% highest). In hyperopia, headache was most reported in patients between 13-30 years amongst whom the 19-24-year group (44.1%) complained the most followed by the 25-30-year group (40.7%) and 13-18-year-old (34%) group. In astigmatism, there was a progressive decrease and increase in headache from 7- 30 years old 7-12 (57.1%), 13-18 (58.1%), 19-24 (55.2%) and 25-30 (54.5%) respectively (Table 2).

Table 1. Age and sex distribution of different types of refractive errors in a Yemeni population 0-30 years (N=1,500)

Subgroup	Sample	Myopia (N=500)		Hyperopia (N=800)		Astigmatism (N= 200)	
		N	%	N	%	N	%
Age group							
0-6	125	35	28.0	90	72.0	0	0
7-12	220	65	29.5	120	54.6	35	15.9
13-18	413	90	21.8	280	67.8	43	10.4
19-24	372	135	36.3	170	45.7	67	18.0
25-30	370	175	47.3	140	37.8	55	14.9
Sex							
Male	700	300	42.9	300	42.9	100	14.3
Female	800	200	25.0	500	62.5	100	12.5
Total	1500	500	33.3	800	53.3	200	13.4

Table 2. Frequency of Presenting Symptoms and Signs (%) for all Types of Refractive Error According to Age Group (N=1,500)

	Age group	Sample	*DV		*HA		*Ex		*Es	
			N	%	N	%	N	%	N	%
Myopia	0-6	35	17	48.6	0	0	12	34.3	6	17.1
	7-12	65	25	38.5	6	9.2	30	46.1	4	6.2
	13-18	90	45	50	10	11.1	35	38.9	0	0
	19-24	135	78	57.8	32	23.7	25	18.5	0	0
	25-30	175	100	57.2	41	23.4	34	19.4	0	0
	Total	500	265	53	89	17.8	136	27.2	10	2
Hyperopia		Sample	*DV		*HA		*Ex		*Es	
			N	%	N	%	N	%	N	%
	0-6	90	30	33.3	0	0	5	5.6	55	61.1
	7-12	120	50	41.7	3	2.5	5	4.1	62	51.7
	13-18	280	100	35.7	95	34	25	8.9	60	21.4
	19-24	170	70	41.2	75	44.1	10	5.9	15	8.8
	25-30	140	67	47.9	57	40.7	13	9.3	3	2.1
	Total	800	317	39.6	230	28.8	58	7.3	195	24.3
Astigmatism		Sample	*DV		*HA		*Ex		*Es	
			N	%	N	%	N	%	N	%
	0-6	0	0	0	0	0	0	0	0	0
	7-12	35	10	28.6	20	57.1	5	14.3	0	0
	13-18	43	18	41.9	25	58.1	0	0	0	0
	19-24	67	30	44.8	37	55.2	0	0	0	0
	25-30	55	25	45.5	30	54.5	0	0	0	0
	Total	200	83	41.5	112	56	5	2.5	0	0

*DV= Decreased vision; HA= Headache; Ex= Exotropia; Es= Esotropia

In our population, muscle imbalance, namely exotropia, a form of strabismus where the eyes are deviated outward was found in 27.2% in myopia patients and esotropia, a form of strabismus in which one or both eyes turn inward found in 2% of myopia patients. In myopia patients, exotropia was found in all age groups 0-6 (34.3%) and 7 – 12 (46.1%) and 13 - 18 (38.9%), 19-24 (18.5%) and 25 – 30 (19.4%) respectively. A similar trend but with much lesser frequency of exotropia was found in patients with hyperopia with the highest frequency (9.3%) in the 25-30-year group. Exotropia was not a feature of astigmatism, except in a very small percentage of 7-12 (14.3%) year old (Table 2).

Similarly, esotropia was not found in astigmatism and only found in a small proportion of patients with myopia (2%). None of those aged between 13 – 30 years with myopia presented with esotropia. However, esotropia was a common feature in hyperopia, most common in the much earlier age groups 0 -6 (61.1%) and 7 – 12-year-olds (51.7%). It was also found in 13 – 18 (21.4%) and 19 – 24 (8.8%) year olds but very uncommon in 25 – 30 years old (2.1%) (Table 2). Presbyopia was not reported in our population due to the age distribution as it affects most people over the age of 35.

Discussion

Refractive errors are the most common ocular problem affecting all age groups and considered as a public health challenge. Recent studies and WHO reports indicate that refractive errors are the first cause of visual impairment and the second cause of visual loss worldwide as 43% of visual impairments are attributed to refractive errors (17). A review study showed that uncorrected refractive errors were responsible for visual impairment in 101.2 million people and blindness in 6.8 million people in 2010 (18). Generally prevalence of refractive errors varies among different populations due to differences in their genetic background and diverse environmental factors (19). This study determined the types and presentation of different refractive errors among children and young adults of age 0-30 years who visited the major referral center for eye problems in Sanaa, Yemen. Myopia, hyperopia and astigmatism were common conditions affecting the ophthalmic health of the Yemeni population. We found Hyperopia was the most common single diagnosis (53.3%) followed by myopia (33.3%) among this population and astigmatism was uncommon as a single diagnosis (13.4%), but commonly associated with hyperopia or myopia. Myopia was more common in males (42.9%) and less in females (25%), however, hyperopia was more in females (62.5%) and less in males (42.9%). Age groups most affected by refractive errors were 13–18-years (27.7%), 19-24-years (24.8%) and 25-30-years (24.6%) respectively.

Previous studies reported a decrease in myopia and an increase in hyperopia with increasing age (3, 20-23). In this study, there is an increase in the frequency of myopia with age from 0-6 years to 25- 30 years and it was more common in males compared to females. In a study conducted in a Mexican population myopia was the most common refractive error, and the proportion seemed to increase among the younger population (10 to 29 years old), but hyperopia increased among the aging population (40 to 79 years old)(21). In our study population hyperopia was the most common single diagnosis (53.3%) among age groups from 0-30 years and is present most with the age group 13-18 years. This difference may be due the age distribution of our study population, our sample size only representing children and young adults. This needs to be considered further.

According to a meta-analysis conducted in the Middle East region the prevalence of astigmatism was 15% (95% CI 10, 19) in subjects less than or equal to 15 years and 24% (95% CI 16, 31) in those older than 15 years of age (24). The prevalence of astigmatism in males and females less than or equal to 15 was 9.0% (95% CI 0.7–17.3) and 9.9% (95% CI 1.5–18.3), respectively, and the prevalence in males and females over 15 years of age was 31.1% (95% CI 18.7, 43.6) and 29.6% (95% CI 17.2, 42.1), respectively(24). We found astigmatism was uncommon as a single diagnosis (13.4%) but commonly associated with hyperopia or myopia. Astigmatism is higher in males (14.2%) compared to the females (12.5%) and is associated with hyperopia and myopia. This needs to be explored further.

The association of gender with refractive errors has not been well established. Some studies have reported that the prevalence of myopia is higher in men than in women (25-29). In other studies, however, this trend was not observed(30, 31). In this study, the distribution of myopia is higher in men (42.9%) than in women (25%). Symptoms like decreased vision and headache were distributed as, decreased vision was relatively and more uniformly high in myopia. However, in hyperopia, decreased vision, there was a progressive decrease with age, the highest being in young adults 19-30 years old. In astigmatism, decreased vison, there was a progressive increase in presentation with age, the highest being in young adults 19-24 years old. Headache was more common above 12 years in myopia, hyperopia and astigmatism conditions. Fewer patients with myopia complained of headache, with a peak age group of 25-30 years. Patients with 13 years and above with hyperopia presented with headache and in 13-18 years old complained most. Children 7-12 years old with astigmatism complained mostly with headache. And in conditions like exotropia and esotropia there were fewer common complaints in all three conditions and at different ages. However, patients with myopia were more likely to also have exotropia, especially older children 7-12-years. In hyperopia, exotropia is high in 13-18 years old and those with astigmatism rarely presented with exotropia, except children 0-12 years old. On the contrary, esotropia was most common in children with 0-12 years old with hyperopia, and rare among those with astigmatism and myopia beyond 6 years and 12 years respectively.

The limitations of the current study included that the selection of individuals was conducted using non-probability sampling and did not also consider regional and occupational differences. For wider use and predictive generalization, a more randomized probability population sample may be necessary. Thus, despite possible limitations, a sample of patients who visited the ophthalmic clinic for any laboratory service or visual examination from different parts of the Yemen was used for the examination of refractive errors, which ensures some representation of the population. Furthermore, the types and presentations of refractive error in children and young adults has not been previously studied in Yemen. To our knowledge, this is the first report of refractive error in the Yemeni population.

Conclusion

The information of this study can be used to characterize and potentially predict the association of age and types of refractive error among Yemeni children and young adults. The findings may be found useful among primary care and general practitioners and eye specialists and could help in the development of simple diagnostic tools such as clinical algorithms to aid early diagnosis and management.

References

1. Denniston AM, Philip Oxford Handbook of Ophthalmology ed.). editor: Oxford. ; 2018.
2. Facts About Refractive Errors [cited October 2010. Available from: https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/refractive-errors.
3. Foster PJ, Jiang Y. Epidemiology of myopia. Eye (Lond). 2014;28(2):202-8.
4. Pan CW, Ramamurthy D, Saw SM. Worldwide prevalence and risk factors for myopia. Ophthalmic Physiol Opt. 2012;32(1):3-16.
5. Castagno VD, Fassa AG, Carret ML, Vilela MA, Meucci RD. Hyperopia: a meta-analysis of prevalence and a review of associated factors among school-aged children. BMC Ophthalmol. 2014;14:163.
6. Grosvenor T. Primary care optometry. (5 ed.) ed: Elsevier.; (2007). Archived from the original on 2016-08-15.
7. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015;386(9995):743-800.
8. Pan CW, Dirani M, Cheng CY, Wong TY, Saw SM. The age-specific prevalence of myopia in Asia: a meta-analysis. Optom Vis Sci. 2015;92(3):258-66.
9. Holden BA, Fricke TR, Wilson DA, Jong M, Naidoo KS, Sankaridurg P, et al. Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. Ophthalmology. 2016;123(5):1036-42.
10. Lin LL, Chen CJ, Hung PT, Ko LS. Nation-wide survey of myopia among schoolchildren in Taiwan, 1986. Acta Ophthalmol Suppl. 1988;185:29-33.
11. Edwards MH, Lam CS. The epidemiology of myopia in Hong Kong. Ann Acad Med Singap. 2004;33(1):34-8.
12. Goh WS, Lam CS. Changes in refractive trends and optical components of Hong Kong Chinese aged 19-39 years. Ophthalmic Physiol Opt. 1994;14(4):378-82.
13. Saxena R, Vashist P, Tandon R, Pandey RM, Bhardawaj A, Gupta V, et al. Incidence and progression of myopia and associated factors in urban school children in Delhi: The North India Myopia Study (NIM Study). PLoS One. 2017;12(12):e0189774.
14. Wu PC, Huang HM, Yu HJ, Fang PC, Chen CT. Epidemiology of Myopia. Asia Pac J Ophthalmol (Phila). 2016;5(6):386-93.
15. Relhan N, Jalali S, Pehre N, Rao HL, Manusani U, Bodduluri L. High-hyperopia database, part I: clinical characterisation including morphometric (biometric) differentiation of posterior microphthalmos from nanophthalmos. Eye (Lond). 2016;30(1):120-6.
16. Hashemi H FA, Yekta A, Pakzad R, Ostadimoghaddam H, Khabazkhoob M. . Global and regional estimates of prevalence of refractive errors: Systematic review and meta-analysis. J Curr Ophthalmol. 2017;30(1):3-22.
17. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Br J Ophthalmol. 2012;96(5):614-8.
18. Naidoo KS, Leasher J, Bourne RR, Flaxman SR, Jonas JB, Keeffe J, et al. Global Vision Impairment and Blindness Due to Uncorrected Refractive Error, 1990-2010. Optom Vis Sci. 2016;93(3):227-34.
19. Gomez-Salazar F, Campos-Romero A, Gomez-Campaña H, Cruz-Zamudio C, Chaidez-Felix M, Leon-Sicairos N, et al. Refractive errors among children, adolescents and adults attending eye clinics in Mexico. Int J Ophthalmol. 2017;10(5):796-802.
20. Rodriguez NM, Romero AF. The prevalence of refractive conditions in Puerto Rican adults attending an eye clinic system. J Optom. 2014;7(3):161-7.
21. Lee KE, Klein BE, Klein R, Wong TY. Changes in refraction over 10 years in an adult population: the Beaver Dam Eye study. Invest Ophthalmol Vis Sci. 2002;43(8):2566-71.
22. Ferraz FH, Corrente JE, Opromolla P, Padovani CR, Schellini SA. Refractive errors in a Brazilian population: age and sex distribution. Ophthalmic Physiol Opt. 2015;35(1):19-27.
23. Haegerstrom-Portnoy G, Schneck ME, Lott LA, Hewlett SE, Brabyn JA. Longitudinal increase in anisometropia in older adults. Optometry and vision science : official publication of the American Academy of Optometry. 2014;91(1):60-7.
24. Khoshhal F, Hashemi H, Hooshmand E, Saatchi M, Yekta A, Aghamirsalim M, et al. The prevalence of refractive errors in the Middle East: a systematic review and meta-analysis. Int Ophthalmol. 2020;40(6):1571-86.
25.\ Hashemi H, Fotouhi A, Yekta A, Pakzad R, Ostadimoghaddam H, Khabazkhoob M. Global and regional estimates of prevalence of refractive errors: Systematic review and meta-analysis. J Curr Ophthalmol. 2018;30(1):3-22.
26. Huang HM, Chang DS, Wu PC. The Association between Near Work Activities and Myopia in Children-A Systematic Review and Meta-Analysis. PLoS One. 2015;10(10):e0140419.

27. Attebo K, Ivers RQ, Mitchell P. Refractive errors in an older population: the Blue Mountains Eye Study. Ophthalmology. 1999;106(6):1066-72.
28. Wu SY, Nemesure B, Leske MC. Refractive errors in a black adult population: the Barbados Eye Study. Invest Ophthalmol Vis Sci. 1999;40(10):2179-84.
29. Vitale S, Ellwein L, Cotch MF, Ferris FL, 3rd, Sperduto R. Prevalence of refractive error in the United States, 1999-2004. Arch Ophthalmol. 2008;126(8):1111-9.
30. Katz J, Tielsch JM, Sommer A. Prevalence and risk factors for refractive errors in an adult inner city population. Invest Ophthalmol Vis Sci. 1997;38(2):334-40.
31. Xu L, Li J, Cui T, Tong Z, Fan G, Yang H, et al. Frequency of under-corrected refractive errors in elderly Chinese in Beijing. Graefes Arch Clin Exp Ophthalmol. 2006;244(7):871-3.

Healthcare providers readiness to response to Spousal Abuse in Saudi Arabia: survey among medical and dental graduates

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Abstract

Objectives: Under-reporting despite high prevalence of domestic violence (DV) indicates a serious gap in identifying and reporting domestic violence. Therefore this study aims to assess the readiness of health care workers in identifying and handling intimate partner violence.

Methods: A cross-sectional study was conducted using the Domestic Violence Health Care Provider Survey tool among medical and dental interns and residents in Saudi Arabia to assess their readiness to detect, manage and prevent spousal abuse.

Results: 221 participants completed the survey; 53.8% of the respondents were interns and 43.4% were residents. The study showed that only 5.9% of respondents have participated in DV courses during their undergraduate years in medical school. 72.8% of doctors either did not know or were not sure of Saudi national policies to manage DV and 86.9% of the health care providers were not aware of the national help line number to report a suspected DV case.

Conclusion: Lack of teaching and training sessions on managing domestic violence during the undergraduate years shows that health care professionals are evidently underprepared and calls for an urgent need to introduce an interprofessional education curriculum that trains health care professionals of all concerned specialties at undergraduate level on managing domestic violence.

Keywords: Domestic violence. Intimate partner violence, medical education, health care providers

Introduction

The World Health Organization (WHO) has reported domestic violence (DV) as a global public health problem that affects the physical and psychological health of women, adolescents, children, and the elderly. Intimate partner violence (IPV) or "spousal abuse," is a form of DV and has been defined by WHO as "any behavior within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship" [1]. Women are the victims most affected because of intimate partner violence and exposure to abuse, whether physical, psychological, or sexual, and it increases the likelihood of poor health and serious mental disorders [2].

According to WHO multi-Country Study the percentage of physical or sexual violence by husband or partner reported by women varied between 5% to 71% worldwide and up to 4-12% of these abuses happened during pregnancy [3]. Studies from the Middle East Countries such as Egypt, Palestine, and Tunisia revealed that at least one out of three women are subjected to physical abuse by their husband [4]. A survey conducted in Saudi Arabia showed that the prevalence of lifetime domestic violence among women in Saudi Arabia was 35.9% for mental, 17.9% for physical, and 6.9% for sexual violence [5]. A more recent study in Saudi Arabia reported that almost 45 % of the women participants had been subjected to spousal physical abuse with a reasonable population of victims expecting appropriate treatment by healthcare providers [6]. Despite these studies that highlighted the high prevalence of spouse abuse in Saudi Arabia, only 3.3% of the cases were documented and reported [7]. A study found that practicing dentists and physicians lack sufficient knowledge about DV detection and management, which is attributed to the inadequate exposure to DV education during undergraduate training [8]. This indicates a serious gap in training first line health care workers like physicians and dentists who play a major role in identifying and managing all forms of abuse including spousal abuse.

In Saudi Arabia there are only a few studies that have assessed the readiness of first-line health care providers such as medical and dental doctors to suspect DV-inflicted injuries among patients. Therefore, this study was conducted to reflect the current preparedness of Saudi medical and dental students to detect, manage and prevent spousal abuse.

Methodology

Study design

The study was approved by the IRB at Princess Nourah university. A cross-sectional study was conducted among medical and dental interns and residents in the Saudi Arabian cities of Riyadh, Dammam, and Alhasa. The study included participants from the following public universities - Princess Nourah Bint Abdulrahman University (PNU), King Saud University (KSU), King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Al-Imam Muhammad ibn Saud Islamic University (IMAMU) in Riyadh, Saudi Arabia, King Faisal University (KFU) and Imam Abdulrahman Bin Faisal University (IAU).

The study participants were graduates from the medical and dental colleges of the universities described above who met the following inclusion criteria: that they are currently enrolled in a clerkship (internship) or residency program, are Saudi nationals, and graduated from public universities in Saudi Arabia. Participants who met any of the following exclusion criteria were excluded from the study: graduates from private universities or from universities other than those included here (PNU, KSU, IAU, KFU, IMAMU, or KSAU-HS).

The study participants were approached through the internship program coordinator located at each of the selected public universities and through hospital internship program coordinators. Our study used purposive sampling that included interns and residents from medical and dental colleges who matched all stated inclusion criteria. The chief residents of the respective institutions were requested to distribute the survey.

Sample size

Sample size was calculated based on previous literature from the same research field [5], which stated an average score of 60.5% and with 95% confidence interval and power 85% and 20 % non-response resulting in approximately a sample size of 150 participants.

The survey tools

A combined information Letter/Consent Form formed the cover page of the survey questionnaire and stated the study purpose, method of participation, withdrawal, confidentiality and described the anonymity of the participants as well as the risks and benefits of participation.

The Domestic Violence Health Care Provider Survey Scale was used in this study, which is a validated tool that assesses provider characteristics and training needs and serves to evaluate DV policy interventions. The tool demonstrated a good internal consistency reliability with Cronbach's alpha ranges of 0.73 to 0.91. [9]

The survey had two parts; the first part of the study had questions on demographical and general characteristics of the study participants and the second part of the survey measures the healthcare providers readiness to screen for domestic violence by using the Domestic Violence Health Care Provider Survey Scale. The survey measured six domains that reflect the healthcare providers readiness to screen for domestic violence.

1. Professional role resistant/ fear domain

This domain on professional role resistant/fear of offending patients consists of 8 items that assess the healthcare providers stand on whether inquiry about domestic violence would offend patients or may conflict with the ethics of doctor patient communication.

2. Blame victim domain
The blame victim domain has a subscale with 6 items that assessed health care providers' attitudes toward domestic violence victims.

3. Victim safety domain
The domain on victim safety includes a 5 item subscale that assesses the perception of the health care provider on jeopardizing the victim's safety by questioning about domestic violence.

4. Provider safety domain
The domain on providers' safety assesses the perception of the health care provider on placing himself at risk by inquiring about domestic violence based on a 5 item subscale.

5. Perceived self-efficacy
This domain measures the healthcare providers self-perceived efficiency and confidence in inquiring and offering help about domestic violence. This domain is assessed by a 6 item subscale.

6. System support domain
This domain contains 4 items that reflect on providers' access to support networks for referral and management of intimate partner abuse victims.

Participants' responses were recorded using Likert scale that reflected participants' stand on each of the statements provided. The Likert scale had a range from 1 to 5 which reflects strongly disagree to strongly agree. The score corresponds to their stand on the scale. Some of the statements in the scale are structured in a way such that the scoring needs to be reversed to match the scores from other items. These items' scoring were reversed before doing further analysis on the scores.

The survey was self -administered and took approximately 15 minutes to complete. Completion of all items was mandatory.

Results

A total of 221 respondents completed our survey with a response rate of 88%. Although respondents' gender distribution reflected no significant differences, participant age differed to some extent. Most respondents were between the ages of 20 and 30 years. Almost half of the respondents were from KSU, while IAU had the least participants. [Table 1]

In this sample, the interns represented 53.8% of the responses, while residents represented 43.4%. Only 5.9% of respondents have participated in DV courses during their undergraduate years in medical school.

72.8% of doctors either did not know or were not sure of Saudi national policies to manage DV and 86.9% of the health care providers were not aware of the national help line number to report a suspected DV case.

The distribution of the scores obtained in each domain is shown in Figure 1. The hypothesized association between gender, age, educational level and previous training or awareness and the six domains assessing the readiness to respond to DV did not reach statistical significance (Table 2). However, male participants demonstrated higher perceived self-efficacy in comparison to females, who were more likely to blame IPV victims, showed increased confidence in the support system and were also more worried about their safety than female participants.

Participants in the older age group, who were residents or GP, who were medical doctors and who were trained on DV or aware of national policies showed better readiness to manage IPV than their counterparts, although none of the associations reached statistical significance.

The reliability coefficients (i.e. Cronbach's alphas) for the six domains ranged from 0.62 to 0.77 (Table 4). Inter- factor correlation was estimated using bivariate correlations between the various domains which showed significant correlations ranging from -0.33 to 0.912. (Table 3)

Table 1: Demographic Data of Study Participants

Item	Number	Percentage
Gender		
Female	103	46.6%
Male	118	53.4%
Age		
20–25	124	56.1%
More than 25 years	97	43.9%
University		
PNU	19	8.6%
KSU	106	48.0%
KSAU-HS	53	24%
IMAMU	16	7.2%
KFU	17	7.7%
IAU	10	4.5%
Specialty		
Medical	197	89.1%
Dentistry	24	10.9%
Level		
Intern	119	53.8%
Resident	96	43.4%
General practitioner (GP)	6	2.7%
Have you participated in any DV teaching courses during your years of study?		
Yes	13	5.9%
No	208	94.1%
Are you aware about any national policy (in Saudi Arabia) to manage DV?		
Yes	60	27.1%
No	88	39.8%
Not sure	73	33%
Do you know the national number to call to report suspected DV cases?		
Yes	29	13.1%
No	192	86.9%

Table 2: Association of various factors with the six domains

Factors		D1	D2	D3	D4	D5	D6
Gender	Male	2.78±0.6	2.37±0.74	3.01±0.5	3.35±0.58	3.32±0.7	3.02±0.5
	Female	2.76±0.67	2.75±0.79	2.97±0.52	3.59±0.53	3.6±0.7	3.33±0.55
Age group	20-25 years	2.75±0.61	2.53±0.73	2.97±0.49	3.46±0.55	3.39±0.69	3.22±08.57
	> 25 years	2.8±0.68	2.64±0.86	3.01±0.54	3.51±0.59	3.57±0.73	3.14±0.52
Designation	GP/Resident	2.73±0.63	2.55±0.83	2.98±0.52	3.43±0.61	3.45±0.74	3.15±0.56
	Intern	2.8±0.64	2.6±0.75	2.99±0.5	3.52±0.53	3.48±0.69	3.21±0.54
Specialty	Medicine	2.72±0.62	2.61±0.78	2.98±0.5	3.5±0.55	3.51±0.69	3.2±0.54
	Dentist	3.15±0.65	2.32±0.8	3.08±0.61	3.33±0.73	3.17±0.85	3.03±0.6
Previous training	Yes	2.68±0.54	2.45±0.85	3.11±0.57	3.9±0.44	3.85±0.63	3.25±0.63
	No	2.78±0.64	2.58±0.79	2.98±0.51	3.45±0.57	3.44±0.71	3.18±0.55
Aware of national policy on DV management	Yes	2.55±0.6	2.47±0.87	3.01±0.52	3.65±0.55	3.65±0.69	3.24±0.57
	No	2.85±0.63	2.61±0.75	2.98±0.51	3.42±0.57	3.4±0.71	3.17±0.54
Aware of national number to report DV	Yes	2.61±0.6	2.35±0.8	2.92±0.54	3.6±0.6	3.58±0.73	3.36±0.75
	No	2.79±0.64	2.61±0.78	3±0.51	3.46±0.57	3.45±0.71	3.16±0.51

D1- Professional role, D2- Blame victim, D3- Victim safety, D4- Self efficacy, D5 – System support, D6- Provider safety

Table 3: Original Domains, Maximum and Minimum Sample Values, and Cronbach's Alpha

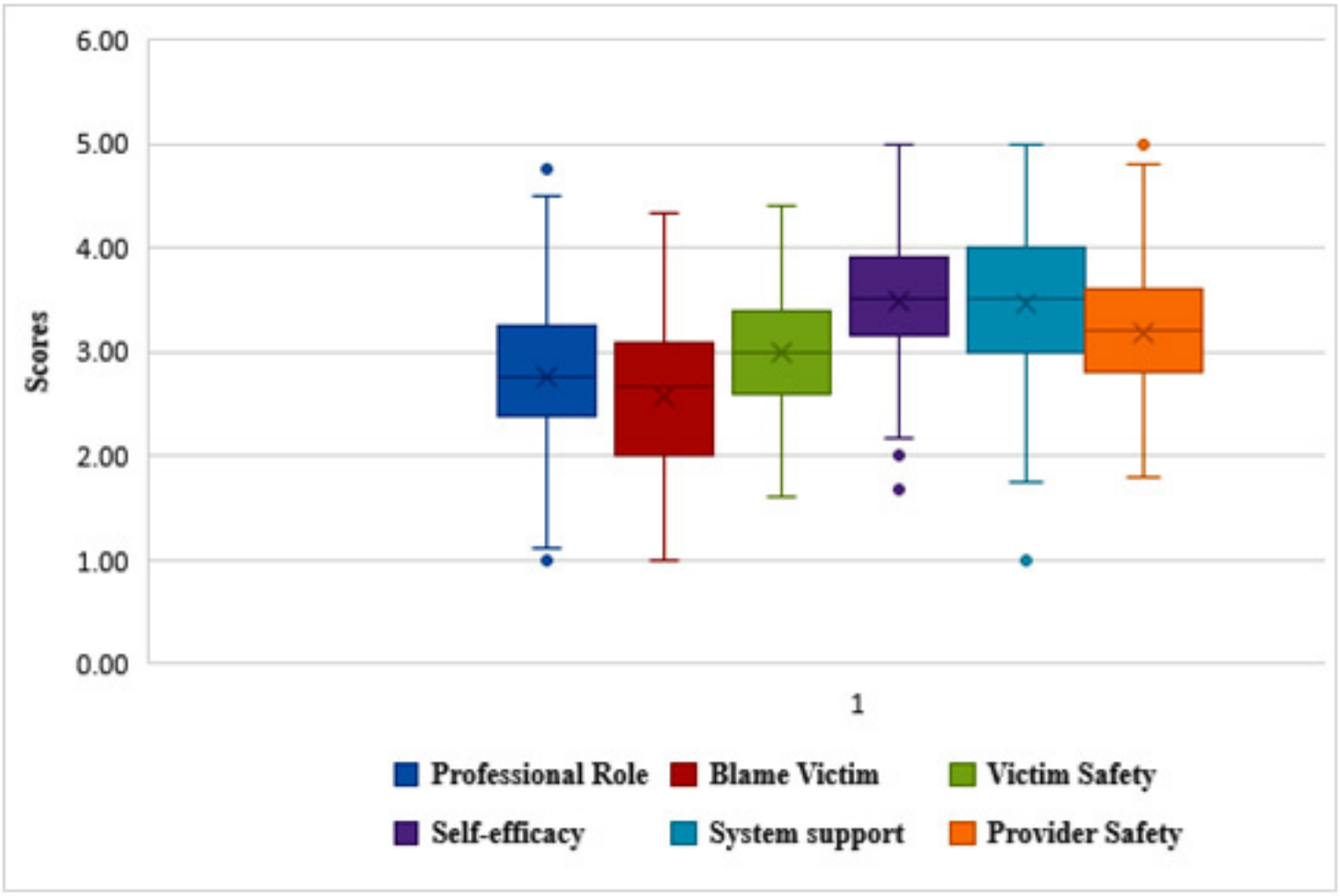
Domain	Number of items	Minimum	Maximum	Mean	Alpha original study (Maiuro, 2000)	Alpha (current study)
Provider safety	5	3.01	3.65	3.243	0.80	0.62
System support	4	3.23	3.70	3.371	0.77	0.77
Self-efficacy	6	2.33	3.71	3.255	0.73	0.72
Victims' safety	5	1.91	3.18	2.552	0.77	0.71
Victim blaming	6	2.24	2.90	2.575	0.72	0.78
Professional role	8	2.3	3.38	2.770	0.73	0.75

Table 4: Bivariate Pearson Correlations of Domestic Violence Healthcare Providers Survey Scales

	Professional Role	Blame Victim	Victim Safety	Self-efficacy	System support	Provider Safety
Professional Role	1					
Blame Victim	0.262**	1				
Victim Safety	0.303**	0.263**	1			
Self-efficacy	-0.156*	0.011	-0.028	1		
System support	-0.102	0.077	-0.005	0.912**	1	
Provider Safety	-0.258**	-0.012	-0.330**	0.357**	0.299**	1

** Correlation is significant at 0.01 level (2-tailed)
* Correlation is significant at 0.05 level (2-tailed)

Figure 1: Scores and distribution of the six domains



Discussion

Our study assessed the health care providers preparedness and ability to manage DV victims and we found that most participants lacked knowledge of Saudi policies, laws, and the national number for reporting suspected DV. About 94% did not undergo any previous teaching or training on handling DV victims. These findings reflect that the health care professionals lacked sufficient knowledge and training on managing DV victims. The health care providers who lacked any kind of previous training or who were unaware of the national policies and helpline numbers for domestic violence victims showed more fear of offending DV patients, blamed the victims more and perceived lack of access to support system and referral. This was evident from the mean scores attained on the various domains of the scale though no statistical significance was attained due to the smaller number of participants who had received training or had awareness on the policies. Most DV victims repeatedly suffer injures and visit health care centers when acutely injured to seek medical advice from physicians or dentists for unusual trauma, behavior, or mental issues, so it is crucial that health care providers be knowledgeable and trained in identifying such victims and advising on appropriate management.

A recently published study in the USA, has also showed that health care providers were not well equipped and they needed better training to work with victims of domestic violence [10]. Studies have also shown that educational programs and training for health care providers leads to significant improvement in their readiness to identify and manage domestic violence cases [11,12].

Further analysis on factors was done on gender and its correlation to the scales which showed males were more likely than females to blame the victims, males had higher perceived self-efficacy and appeared to be more concerned about their safety as health care providers than females. However, in our study the difference was not statistically significant. Previous studies have shown similar findings that males are significantly more likely to blame victims for provoking their partners to inflict DV on them [13]. A study done in Turkey on medical students also reported that male students have higher perceived self- efficacy with academic performance [14]. This might also reflect the male-predominant culture in Saudi Arabia, which also explains the high self-efficacy scores from Imam bin Mohamad bin Saud University who has only males graduates from their college. Moreover, females are more sympathetic toward victims because they are usually the same gender as the victim, which could also explain why graduates of all-female PNU were the least likely to blame victims. This was also supported by a study done in Sweden which showed female health care providers are more likely to screen patients for domestic violence [15].

Though we did not achieve statistical significance in our study our scores showed that males appeared to be more concerned about their safety as health care providers than females, which completely differed from previous research results, which stated the opposite [16].

This study also showed that healthcare providers in the age group of 20–25 portrayed low self-efficacy, more fear for their safety and perceived less support from the system than healthcare providers who were more than 25 years old, but again we did not achieve any statistical significance. This could be due to the fact that most of the health care providers in this 20-25 years age group were interns and lacked experience as they were new graduates and haven't

As for the relationship between the various domains and level of education, interns perceived themselves to be more self-efficient yet scored high in victim blaming and feared more about their safety which is attributable to their lack of knowledge, experience and understanding of intimate partner violence. General practitioners/Residents also showed less readiness to manage DV victims possibly because the GPs who participated in our research were not working full-time in the clinical field and therefore had less exposure to DV victims and, thus, lacked experience and knowledge in dealing with the victim.

As for the relationship between domain and specialty, dentistry graduates showed low self-efficacy and high levels of fear of offending the patients, attributable to their fear that patients would be embarrassed to visit their practice again. The difference was not statistically significant which might be because we had a smaller number of participants from the dental background. Similar reports were seen from another study that showed dental students feared they might acquire a negative reputation from asking about IPV and that can have a negative impact on their practice; also about 30% did not have the confidence to refer battered victims to social administration offices [8].

Bivariate correlations were analyzed to understand the distinctiveness between the domains. These correlations though statistically significant were low except for self-efficacy and system support which showed statistically significant high correlation. Some of the domains showed negative correlation indicated that though the various domains are related to each other they represent and analyze distinctive aspects of provider readiness to screen for domestic violence. Similar correlations were established in another study done among health care providers in Nigeria. [17].

Some of the limitations of this study are the data collected in this study is self-reported data therefore liable for information bias. This was a cross-sectional survey so the results do not allow for causality interpretation. Participants were limited to government institutions and this selection bias could affect the generalizability of the results.

Conclusion

The medical and dental graduates lack knowledge of Saudi policies or regulations on response to domestic violence and are not well equipped to work with patients who are victims of domestic violence. Lack of teaching and training sessions on managing domestic violence during the undergraduate years shows that health care professionals are evidently underprepared and calls for an urgent need to introduce an interprofessional education curriculum that trains health care professionals of all concerned specialties at undergraduate level on managing domestic violence. Encouraging training courses for practicing healthcare providers would help build more proficient and capable health care providers to handle such sensitive problems in society.

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References

1. World Health Organization and Pan American Health Organization. Understanding and addressing violence against women: Intimate partner violence. Geneva, Switzerland: World Health Organization. 2012. Available at: http://apps.who.int/iris/bitstream/handle/10665/77432/WHO_RHR_12.36_eng.pdf?sequence=1 (Accessed on 14 November 2021)
2. Al Dosary AH. Health impact of domestic violence against Saudi women: cross sectional study. International journal of health sciences. 2016 Apr;10(2):165.
3. García-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts C. WHO multi-country study on women's health and domestic violence against women. World Health Organization; 2005.
4. Douki S, Nacef F, Belhadj A, Bouasker A, Ghachem R. Violence against women in Arab and Islamic countries. Archives of women's mental health. 2003 Aug;6(3):165-71.
5. Afifi ZE, Al-Muhaideb NS, Hadish NF, Ismail FI, Al-Qeamy FM. Domestic violence and its impact on married women's health in Eastern Saudi Arabia. Saudi Med J. 2011 Jun 1;32(6):612-20.
6. Eldoseri HM, Sharps P. Risk factors for spousal physical violence against women in Saudi Arabia. Journal of interpersonal violence. 2020 Mar;35(5-6):1269-93.
7. Alzahrani TA, Abaalkhail BA, Ramadan IK. Prevalence of intimate partner violence and its associated risk factors among Saudi female patients attending the primary healthcare centers in Western Saudi Arabia. Saudi medical journal. 2016 Jan;37(1):96.
8. AlAlyani WS, Alshouibi EN. Dentists awareness and action towards domestic violence patients: A cross-sectional study among dentists in Western Saudi Arabia. Saudi medical journal. 2017 Jan;38(1):82.
9. Maiuro RD, Vitaliano PP, Sugg NK, Thompson DC, Rivara FP. Thompson RS. Development of a health care provider survey for domestic violence: psychometric properties. Am J Prev Med. 2000; 19: 245–52.
10. Renner LM, Wang Q, Logeais ME, Clark CJ. Health care providers' readiness to identify and respond to intimate partner violence. Journal of interpersonal violence. 2021 Oct;36(19-20):9507-34.
11. EDUCATE Investigators. Novel educational program improves readiness to manage intimate partner violence within the fracture clinic: A pretest–posttest study. CMAJ open. 2018 Oct;6(4):E628.
12. Sawyer S, Coles J, Williams A, Lucas P, Williams B. Paramedic students' knowledge, attitudes, and preparedness to manage intimate partner violence patients. Prehospital emergency care. 2017 Nov 2;21(6):750-60.
13. Fakunmoju SB, Bammeke FO, Oyekanmi FA, Rasool S, George B, Lachiusa TA. Attribution of blame to victim and attitudes toward partner violence: Cross-national comparisons across the United States, South Africa, and Nigeria.
14. Khan AS, Cansever Z, Avsar UZ, Acemoglu H. Perceived self-efficacy and academic performance of medical students at Ataturk University, Turkey. J Coll Physicians Surg Pak. 2013 Jul 1;23(7):495-8.
15. Lawoko S, Sanz S, Helström L, Castren M. Screening for intimate partner violence against women in healthcare Sweden: prevalence and determinants. International Scholarly Research Network. 2011;2011 Article ID: 510692, 7 pages.
16. Furin, M., Eliseo, L., Langlois, B., Fernandez, W., Mitchell, P. and Dyer, K. (2015). Self-Reported Provider Safety in an Urban Emergency Medical System. Western Journal of Emergency Medicine, 16(3), pp.459-464.
17. John IA, Lawoko S. Assessment of the structural validity of the domestic violence healthcare providers' survey questionnaire using a Nigerian sample. Journal of Injury and Violence Research. 2010 Jun;2(2):75.

Knowledge and Awareness of mothers and caregivers of Diabetic Children about clinical features and complications of Diabetic Ketoacidosis in Riyadh City: questionnaire study

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Abstract

Objectives: Diabetic ketoacidosis (DKA) is a life-threatening metabolic disorder in which complications can be avoidable. The purpose of this study is to describe the knowledge of the Saudi caregivers for diabetic children about Juvenile Diabetes Mellitus, its signs and symptoms and prevention and its complications in children under their care.

Setting and Participants: A cross-sectional, questionnaire-based study design was conducted in Riyadh city in Saudi Arabia. A sample size of at least 412 was required. The total number of respondents that were included in the analysis was 414. The method of collection of data was done by data collectors.

Results: 399 caregivers participated in this study, most of whom were Saudi (376; 94.2%), and gained a university degree (300; 75.2%). The most commonly cited symptom of DM in children was raised blood sugar (225; 56.4%), while the most cited common cause was malnutrition (223; 55.9%), and the most commonly cited manifestation of diabetes was frequent urination (354; 88.7%).

Conclusion: This study showed that most type-1 diabetic caregivers had knowledge and awareness regarding DKA in Riyadh, Saudi Arabia. However, some gaps exist. Further studies would assess more factors to enhance the level of knowledge and awareness, and increase the effectiveness toward the right action and response regarding DKA.

Keywords: Diabetes Mellitus, DKA, Children, Caregivers, Emergency, Saudi Arabia

Introduction

The prevalence of type 1 diabetes mellitus (T1DM) in Saudi Arabia is among the highest globally (1). In 2000, diabetes affected an estimated 171 million people worldwide; by 2011 this had increased to more than 366 million and numbers are expected to exceed 552 million by 2030 (1). One of the major and life-threatening complications of T1DM is diabetic ketoacidosis (DKA) as it may potentially lead to significantly higher rates of morbidity and mortality, along with impacting families and increasing the burden on healthcare systems (2, 3). Diabetic ketoacidosis (DKA) is an acute, serious, life-threatening complication of hyperglycemia, ketoacidosis, and ketonuria. It occurs when absolute or relative insulin deficiency prevents the ability of glucose to enter cells for using it as a metabolic fuel. As a result, the liver rapidly breaks down fat into ketones for use as a fuel source. The overproduction of ketones occurs, causing them to build up in the blood and urine and causing the blood to be acidic. DKA occurs primarily in type 1 diabetes patients, although it is not unusual in some type 2 diabetes patients. The insidious rise in polydipsia and polyuria are the most prominent early symptoms of DKA, beside which, other symptoms such as Malaise, generalized weakness, fatigue, nausea and vomiting, diffuse abdominal pain and decreased appetite are also seen (2–7).

Patients and their families have been the object of self-treatment and the administrators of their care. The health care team are the guides who set the stage and increase efforts, when targets are not reached. Rather than being the only diabetes health care team to initiate treatment, patients and parents are encouraged to evaluate their data, recognize patterns, resolve diet and activity issues, and to do so based on real blood glucose results (8,9). Effective integration of patient-centered strategies, such as shared-decision making, motivational interviewing techniques, shared medical appointments, and multidisciplinary team collaboration, into a dynamic model of diabetes care delivery holds promise in reaching glycemic targets and improving patients' quality of life.

Mothers with more knowledge about diabetes and better education maintained better glycemic control of their children, irrespective of their socio-economic status, and to enhance glycemic control and minimize acute and chronic complications of diabetes in children, knowledge and education of mothers is important (10,11).

The most common emergency case in a patient diagnosed with diabetes mellitus is Diabetic ketoacidosis (DKA). Surprisingly, it is more often we see these patients suffering from DKA type 1 diabetes. However, type 2 diabetes patients are never spared from the susceptibility of suffering from this unfortunate emergency. Otherwise, it was noticeable that type 2 DM patients with DKA were under the effect of certain situations such as post-operative, trauma, accident, or infectious diseases (7,12,13).

DKA is reported to be responsible for more than 100,000 hospital admissions per year in the US and accounts for 4% - 9% of all hospital discharge summaries among patients with diabetes. Alhowaish (2013) has estimated more than 500% acceleration in the expenses incurred for healthcare and treatment of diabetes since 2000 and costed the healthcare budget of Saudi Arabia roughly as 25 billion used exclusively for the management of diabetes.

Diabetic ketoacidosis diagnosis is based on the patient's plasma glucose concentration of 250 mg per dL or more and the bicarbonate level less than 18 mEq per L, and the pH level of 7.30 or less. The main course of treatment for DKA is intravenous insulin and fluid replacement therapy, and obviously with precise checkup and monitoring of the potassium levels. To reach the full level of treatment, it is required to educate patients to prevent the recurrence of such a case (14,15).

For example, a study by Alwan et al. (2017) that studied the awareness about diabetes mellitus among attendees of primary health care centers, in Makkah, Saudi Arabia reported that the main sources of information about diabetes were mass media (57.4%), health sector (29.9%) and educational sector (10.6%) and concluded there was a satisfactory level of knowledge about risk factors, symptoms, and risks of diabetes but not awareness of the diabetes associated secondary complications(16–18).

Moreover, illiteracy and low socioeconomic status were significantly associated with poor knowledge and practice of diabetic foot care (19,20), and that the level of education is the most significant predictor of knowledge regarding risk factors, complications and the prevention of diabetes (21).

This study aims to describe the knowledge of the Saudi caregivers of diabetic children about Diabetes Mellitus in children, its signs and symptoms and prevention and its complications in children under their care in Riyadh city.

Methods

Study design and subjects. This study used a descriptive cross-sectional questionnaire-based design and was conducted in Riyadh city in Saudi Arabia, from August through to November 2020. 399 parents or caregivers of diabetic paediatric patients responded to the questionnaire. The inclusion criteria included being a caregiver for a diabetic child who resided in Saudi Arabia during the study period. As part of the online questionnaire, all the participants received an explanation of the study purpose and were requested to provide informed consent before filling out the online questionnaire. The participants were encouraged to complete the questionnaire voluntarily within the time interval of the study and at their convenience. Moreover, the participants were given the chance to seek the help of a person of their choice to help them fill out the form if they were unable to read or answer the form.

Sample Size. According to the Saudi Arabia General Authority for Statistics, there were 2,470,683 Saudi children aged ≤ 19 years living in Riyadh in 2020. Based on an acceptable error margin equivalent to 5% with a confidence interval of 95%, a sample size of at least 412 was required. The dataset included 431 participants. We excluded participants who were taking care of diabetic patients aged above 16, and if they refused, or did not know the responses to any of the variables of interest, or missing responses. The final sample size after exclusion was 399.

Data Collection Tool. The questionnaire was adapted with the permission of Othman et al. and translated into Arabic (22). The used self-administered questionnaire included 30 items on related knowledge and awareness of caregivers about DKA among their type 1 diabetic children and their action and responses. The questionnaire was presented in two major sections: 14 questions on general demographic characteristics, and 16 questions on DKA knowledge, attitudes, actions and responses.

Data Analysis. The data were collected from an online platform, tabulated by using Microsoft Excel 2016 and analysed using SPSS software version 26. The categorical variables were presented as percentages and frequencies. Both logistic regression tests and univariate chi-square analysis were conducted to determine the associations between the knowledge and attitude and the participants' general characteristics, as well as their attitude and response to the accepted level of knowledge, to obtain odds ratios for adjusted and unadjusted models. A P-value of <0.05 was considered statistically significant. The Medical College Institutional Review Board, Al-Imam Muhammad Ibn Saud Islamic University, Riyadh, Saudi Arabia approved this study protocol.

Results

Demographic features

Table 1 summarizes the demographic features of the participants, which show that most of the participants are 20–29-year-old (239; 60%), Saudi (376; 94.2%), and from the central and western regions of Saudi Arabia (130; 32.6%, and 171; 42.9%, respectively). Also most of them are university educated (300; 75.2%) and have a monthly income more than 5,000 Saudi riyals (298; 74.7%).

Table 1. Demographic features categorized by the sex of the respondents (N = 399).

Demographic feature	Female		Male		Total	
Age group in years						
less than 20 years	24	6.0%	12	3.0%	36	9.0%
20-29	150	37.6%	89	22.3%	239	59.9%
30-39	42	10.5%	4	1.0%	46	11.5%
40-49	42	10.5%	5	1.3%	47	11.8%
50 or more	23	5.8%	8	2.0%	31	7.8%
Total	281	70.4%	118	29.6%	399	100.0%
Nationality						
Non-Saudi	17	4.3%	6	1.5%	23	5.8%
Saudi	264	66.2%	112	28.1%	376	94.2%
Region of Residence						
Central	90	22.6%	40	10.0%	130	32.6%
Eastern	36	9.0%	11	2.8%	47	11.8%
Northern	8	2.0%	0	0.0%	8	2.0%
Southern	30	7.5%	13	3.3%	43	10.8%
Western	117	29.3%	54	13.5%	171	42.9%
Educational level						
Primary	1	0.3%	0	0.0%	1	0.3%
Intermediate	6	1.5%	3	0.8%	9	2.3%
Secondary	48	12.0%	16	4.0%	64	16.0%
University	212	53.1%	88	22.1%	300	75.2%
Master or PhD	14	3.5%	11	2.8%	25	6.3%
Monthly Income						
less than 5000 Riyals	62	15.5%	21	5.3%	83	20.8%
5000-10000 Riyals	82	20.6%	28	7.0%	110	27.6%
More than 10000 Riyals	125	31.3%	63	15.8%	188	47.1%
Prefer not to say	12	3.0%	6	1.5%	18	4.5%

Knowledge about Diabetes Mellitus in children

More than half of the participants described DM in children as raised blood sugar level (225; 56.4%); 89 (22.3%) of them described it as a genetic disease, while 44 (11%) did not know what it was. When specifically asked about its causes, most of the participants referred to genetic factors and malnutrition (335; 84% and 223; 55.9%, respectively), while almost one-third referred to psychological factors affecting children as a possible cause (125; 31.3%).

As for the symptoms of DM in children, the most listed causes were frequent urination and excessive or frequent thirst (354; 88.7% and 311; 77.9%, respectively)

Table 2. Knowledge of caregivers about the definition and causes of DM in children (N-399)

Item of knowledge about DM in children	Freq.	%
What is juvenile DM?		
Disease that affects obese children	35	8.8%
Don't know	44	11.0%
Genetic disease that affects children	89	22.3%
Neuro-psychological disease that affects children under 10	6	1.5%
Raised blood sugar in children	225	56.4%
Causes of diabetes mellitus in children	Freq.	%
Genetic factors	335	84%
Hepatitis	35	8.8%
Malnutrition	223	55.9%
Obesity	21	5.3%
Other reasons	337	84.6%
Psychological factors affecting children	125	31.3%
Symptoms of diabetes mellitus in children	Freq.	%
Frequent urination	354	88.7
Excessive/Frequent thirst	311	77.9
Weight loss	189	47.4
Dryness and sweating	178	44.6
Loss of appetite	115	28.9
Sleeplessness	71	17.9

Discussion

This research was conducted to assess caregivers' knowledge about type-1 diabetic children living in Riyadh Region. Most of the participants were in the age range of 30 - 49 years old (244; 59%), which is consistent with the overall age distribution of the Saudi population, of whom those in the same age group represent 37% of the population as per the latest census in 2016 (23,24). Also, most of the caregivers were non-diabetic (323; 78.0%), which seems to be consistent with the WHO's estimate of the prevalence of DM in KSA at 14.4% (1). However, there are recent studies that suggest a much higher prevalence of DM in the Saudi population at more than 30% (25–28). Half of the participants (207; 50.0%) were university graduates and employed, which is consistent with the national figures that estimate those who are currently studying at universities at more than two million and those employed at more than 3 million (24,29,30).

The diabetic status of the participants was highest among participants who are less than 20 years or more (25; 6.0%), which can be explained by the focus of the study, i.e. pediatric diabetes. DM was also highest among the unemployed (57; 13.8%), which may be seen as both a cause and a result. For example, Weinstein (2004), Naeem (2015), and Dagenais (2016) suggested that unemployment can be a result of DM due to disability and early mortality by disease (31–33), while others have suggested that it may contribute to the development of DM as a result of diminished healthy choices, lack of movement, and reduction in income(33–35).

Most of the participants were unemployed and non-diabetic (154; 37.2%), which could be attributed to the caregivers being mostly women (mothers) who were not working. Moreover, given that the focus of the study is type 1, which is not hereditary, it is unlikely to find as many diabetic mothers.

Interestingly, all of the non-diabetics were educated 323 (10%) (P-value = 0.000). This finding is unlike Seiglie et al. (2020) who found that compared with no formal education; greater educational attainment was associated with an increased risk of diabetes across the 29 countries they included, after adjusting for BMI (36).

Regarding the awareness and knowledge of the caregivers regarding the symptoms, signs and complications of DKA, this study seems to reflect better results compared to previous studies, like that by Farran et al. (2020)

who found that 38.67% of our participants have a poor awareness regarding DKA complications (37). However, the percentages of those who reported DKA could lead to coma (285; 68.8%) are comparable to the 59.3% they found in the same study.

Although 46% know about DKA and 78.7% know that it is a life-threatening case for the child, yet it was still an alarming figure since 35% did not know about it. Moreover, 7.5% think it a simple case, and that requires diabetes self-management education at national levels in Saudi Arabia. Also, 66% agreed that a sign of DKA is vomiting but less apparent symptoms were less known; 28% and 34% suggested colic pain and disturbance of consciousness, respectively, which is worrying because they may indicate an emergency indication of DKA.

Caregivers' knowledge about how to prevent DKA was surprising since it was generally satisfactory at 88.9% yet those who thought they should wait and continue to monitor the blood glucose level was about 88.4%. This requires diabetes educators to educate pediatric patients and the caregivers about "sick day management". Similar conclusions were reached by other authors who studied diabetes in Saudi Arabia and elsewhere (36,38–40).

The patients with DKA are prone to dehydration since hyperglycemia, fever, excessive glycosuria and ketonuria increase fluid losses which must be replaced immediately (fluids should also contain water with salt if there are ongoing losses of fluids such as vomiting or diarrhea. Additionally, in the presence of loss of appetite or decreased blood glucose below approximately 10 mmol/L (180 mg/dL), sugar-containing fluids should also be considered to avoid starvation ketosis.

Diabetes Educators must inform caregivers that during the illness never stop insulin, and must do Self-monitoring of blood glucose and increase the dose if needed and if they do not improve and ketones become significantly positive, and then they must go to the emergency to prevent further complications of DKA. We notice that a range of 61% to 68% of the responded know the complications of DKA could be coma, swelling/edema and severe dehydration.

Limitations

As would be expected with this kind of study, there are a few limitations. Although Riyadh is the capital city and the most populous region (about one third of the Saudi population from various regions live there); conducting this study in a single region is a limitation. There could be more geographical variation. Having the questionnaire online is another limitation, where some older caregivers may not be able to fill it n.. Finally, there was insufficient testing of validity and reliability of the study, which may have increased the power and reliability of our findings.

Conclusions

Most caregivers in this study show knowledge and awareness regarding the signs and symptoms of DKA, however, they need further education since most of them have lack of knowledge of sick day management and how critical it is.

The main factors related to this positive reflection of knowledge and awareness were the level of education of the caregivers. These study findings suggest that it might be beneficial to educate caregivers of type-1 diabetic patients and the patients themselves about DKA self-management, using insulin, and monitoring of blood glucose to prevent complications. This study has potential limitations. Our study is a cross-sectional study. Therefore, difficulty in recalling is a possibility that could affect the validity of the results. Furthermore, we cannot generalize our result to the kingdom of Saudi Arabia, as this study is concerned with the Riyadh region only.

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References

1. International Diabetes Federation. IDF Diabetes Atlas,2017. International Diabetes Federation. IDF Diabetes Atlas, 8th edn. Brussels, Belgium: International Diabetes Federation, 2017. http://www.diabetesatlas.org. International Diabetes Federation; 2017. 1–150 p.
2. Hamdy O. Diabetic Ketoacidosis (DKA): Practice Essentials, Background, Pathophysiology [Internet]. 2021 [cited 2021 Feb 20]. Available from: https://emedicine.medscape.com/article/118361-overview
3. Brink SJ, Miller M, Moltz KC. Education and multidisciplinary team care concepts for pediatric and adolescent diabetes mellitus. Journal of Pediatric Endocrinology and Metabolism. 2002;15(8):1113–30.
4. Fisher JN, Kitabchi AE. A randomized study of phosphate therapy in the treatment of diabetic ketoacidosis. Journal of Clinical Endocrinology and Metabolism. 1983;57(1):177–80.
5. Khoo CM. Diabetes Mellitus Treatment. In: International Encyclopedia of Public Health. Elsevier Inc.; 2016. p. 288–93.
6. Effect of intensive diabetes treatment on the development and progression of long-term complications in adolescents with insulin-dependent diabetes mellitus: Diabetes Control and Complications Trial. The Journal of Pediatrics. 1994;125(2):177–88.
7. Umpierrez GE, Jones S, Smiley D, Mulligan P, Keyler T, Temponi A, et al. Insulin analogs versus human insulin in the treatment of patients with diabetic ketoacidosis: A randomized controlled trial. Diabetes Care. 2009 Jul;32(7):1164–9.

8. Ergun-Longmire B, Clemente E, Vining-Maravolo P, Roberts C, Buth K, Greydanus DE. Diabetes education in pediatrics: How to survive diabetes. Disease-a-Month. 2021 Feb 2;101153.
9. Funnell MM, Brown TL, Childs BP, Haas LB, Hosey GM, Jensen B, et al. National standards for diabetes self-management education. Vol. 32, Diabetes Care. 2009. p. S87–94.
10. Tawfique A, Aboelmagd A, SYLWAN NM, 2021 undefined. Mothers' Knowledge and Reported Practices about Corona Virus Disease-19 (COVID-19) among their Children with Diabetes Mellitus. researchgate.net [Internet]. [cited 2022 May 16]; Available from: https://www.researchgate.net/profile/Asmaa-Tawfik-7/publication/353803118_Mothers'_Knowledge_and_Reported_Practices_about_Corona_Virus_Disease_-19_COVID-19_among_their_Children_with_Diabetes_Mellitus/links/61127b9d0c2bfa282a342c49/Mothers-Knowledge-and-Reported-Practices-about-Corona-Virus-Disease-19-COVID-19-among-their-Children-with-Diabetes-Mellitus.pdf
11. Megeid FYA, El-Sayed MMA. Health education intervention improves knowledge, attitude and practices of mothers of insulin dependent diabetes mellitus. World Applied Sciences Journal. 2012;
12. Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Hyperglycemic crises in adult patients with diabetes. Diabetes Care. 2009 Jul;32(7):1335–43.
13. Alhowaish A. Economic costs of diabetes in Saudi Arabia. Journal of Family and Community Medicine. 2013;20(1):1.
14. Moini J. Diabetic Ketoacidosis. In: Epidemiology of Diabetes [Internet]. Elsevier; 2019 [cited 2021 Feb 20]. p. 147–51. Available from: https://linkinghub.elsevier.com/retrieve/pii/B9780128168646000092
15. Rawla P et al.AVE, 2017 undefined. Euglycemic diabetic ketoacidosis: a diagnostic and therapeutic dilemma. edm.bioscientifica.com [Internet]. [cited 2021 Feb 20]; Available from: https://edm.bioscientifica.com/view/journals/edm/2017/1/EDM17-0081.xml
16. Al-Shehri AM, Al-Alwan I. Accreditation and culture of quality in medical schools in Saudi Arabia. Med Teach [Internet]. 2013;35 Suppl 1(sup1):S8-14. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23581902
17. Trachtenbarg DE. Diabetic ketoacidosis. American Family Physician. 2005 May 1;71(9):1705–14.
18. Kaabba A al, Alzuair B, et al.YAOJ of, 2021 undefined. Knowledge and Awareness of Caregivers about Diabetic Ketoacidosis among Type-1 Diabetic Children and Their Action and Response in Riyadh City. scirp.org [Internet]. [cited 2022 May 16]; Available from: https://www.scirp.org/journal/paperinformation.aspx?paperid=109097
19. Boulton AJM, Kirsner RS, Vileikyte L. Neuropathic diabetic foot ulcers. Vol. 351, New England Journal of Medicine. 2004. p. 48-55+109.
20. Dorresteijn JAN, Valk GD. Patient education for preventing diabetic foot ulceration. Vol. 28, Diabetes/Metabolism Research and Reviews. 2012. p. 101–6.
21. Kaabba AF al, Alzuair BS, AlHarbi YF, Alshehri JA, Allowaihiq LH, Alrashid MH, et al. Knowledge and Awareness of Caregivers about Diabetic Ketoacidosis among Type-1 Diabetic Children and Their Action and Response in Riyadh City. Open Journal of Endocrine and Metabolic Diseases [Internet]. 2021 May 17 [cited 2022 Jun 13];11(5):119–28. Available from: http://www.scirp.org/journal/PaperInformation.aspx?PaperID=109097
22. Othman A, Ahmad M, al Qahtani A, Mahmood K, Aziz A, Asiri SM, et al. about Diabetic Ketoacidosis among Type-1 Diabetic Children and Their Action and Response in Emergency Conditions in Aseer Region of Saudi Arabia. scholar.archive.org [Internet]. [cited 2022 May 16]; Available from: https://scholar.archive.org/work/onc27vrumrbu3n3ypwspt2542u/access/wayback/https://pdfs.semanticscholar.org/5359/6b72ff6b3c8f32911753b687b7e88e56877b.pdf
23. Saudi Ministry of Health. Kingdom of Saudi Arabia ANNUAL STATISTICAL BOOK [Internet]. Riyadh, Sau; 2017 [cited 2019 Oct 28]. Available from: www.moh.gov.sa
24. Ministry of Health D of FM. The annual statistical book of the work of the Sharia Medical Panels in Saudi Arabia. 2015. 2015.
25. Al-Rubeaan K, Al-Manaa HA, Khoja TA, Ahmad NA, Al-Sharqawi AH, Siddiqui K, et al. Epidemiology of abnormal glucose metabolism in a country facing its epidemic: SAUDI-DM study. Journal of Diabetes. 2015 Sep 1;7(5):622–32.
26. Salman H, Abanamy A, medicine BGD, 1991 undefined. Childhood diabetes in Saudi Arabia. Wiley Online Library [Internet]. [cited 2022 Jun 16]; Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1464-5491.1991.tb01567.x?casa_token=YNFAkoL5_QgAAAAA:KBTUWoiXPW6idezstXuNavqmSp-5n3TJx2VVrsy7t_PWahSyPBSKEGN1NyrPvbVgYcp00Lumx2BDFg
27. Al-Nozha M, Al-Maatouq M, Al-Mazrou Y. Diabetes mellitus in Saudi Arabia. 2004 [cited 2021 Feb 8]; Available from: http://repository.nu.edu.sa/handle/123456789/2272
28. Sciences ZNI journal of health, 2015 undefined. Burden of diabetes mellitus in Saudi Arabia. ncbi.nlm.nih.gov [Internet]. [cited 2022 Jun 16]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4633187/
29. Alrukban MO, Albadr BO, Almansour M, Sami W, Alshuil M, Aldebaib A, et al. Preferences and attitudes of the Saudi population toward receiving medical bad news: A primary study from Riyadh city. Journal of Family & Community Medicine [Internet]. 2014 [cited 2021 Sep 22];21(2):85. Available from: /pmc/articles/PMC4073565/
30. al Mansour MA. The prevalence and risk factors of type 2 diabetes mellitus (DMT2) in a semi-urban Saudi population. International Journal of Environmental Research and Public Health. 2020 Jan 1;17(1).
31. Weinstein AR, Sesso HD, Lee IM, Cook NR, Manson JAE, Buring JE, et al. Relationship of physical activity vs body mass index with type 2 diabetes in women. J Am Med Assoc. 2004 Sep 8;292(10):1188–94.
32. Atypical Presentation of Shaken Baby Syndrome (Case Report). Dr / Hanan Said - Dr / Hesham Fathy- Dr / Khalid Danish-Dr / Gihad Mohamed and Dr / Naeem Mirza King Khaled Military City Hospital King Fahad Military Medical Complex . December 2019. 2019;1–7.
33. Chow CK, Teo KK, Rangarajan S, Islam S, Gupta R, Avezum A, et al. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. JAMA -

- Journal of the American Medical Association. 2013 Sep 4;310(9):959–68.
34. Naeem Z. Burden of Diabetes Mellitus in Saudi Arabia. International Journal of Health Sciences. 2015 Sep;9(3):V–VI.
35. Weinstein AR, Sesso HD, Lee IM, Cook NR, Manson JAE, Buring JE, et al. Relationship of physical activity vs body mass index with type 2 diabetes in women. J Am Med Assoc. 2004 Sep 8;292(10):1188–94.
36. Seiglie JA, Marcus ME, Ebert C, Prodromidis N, Geldsetzer P, Theilmann M, et al. Diabetes prevalence and its relationship with education, wealth, and BMI in 29 low- And middle-income countries. Diabetes Care. 2020 Apr 1;43(4):767–75.
37. Farran RBA, et al BEJ of F, 2020 undefined. Level of awareness of diabetic ketoacidosis among diabetes mellitus patients in Riyadh. ncbi.nlm.nih.gov [Internet]. [cited 2022 May 16]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/pmc7491756/
38. Deye, N., Vincent, F., Michel, P., Ehrmann, S., Da Silva, D., Piagnerelli, M., Laterre, P.-F. (2016). Changes in cardiac arrest patients' temperature management after the 2013 trial: Results from an international survey. Annals of Intensive 6(1). http://doi.org/10.1186/s13613-015-0104-6,
39.Al-Hussaini,M.,&Mustafa,S.(2016).Adolescentsâ€TM knowledge and awareness of diabetes mellitus in Kuwait. Alexandria Journal of Medicine, 52(1) 61–66. http://doi.org/10.1016/j.ajme.2015.04.001,
40. Pollach, G., Brunkhorst, F., Mipando, M., Namboya, F., Mndolo, S., & Luiz, T. (2016). The first digit law" A hypothesis on its possible impact on medicine and development aid. Medical Hypotheses, 97 102–106. http://doi.org/10.1016/j.mehy.2016.10.021,
41. Asiedu, K., Kyei, S., Ayobi, B., Agyemang, F. O., & Ablordeppey, R. K. (2016). Survey of eye practitioners preference of diagnostic tests and treatment modalities for dry eye in Ghana. Contact Lens Anterior Eye, 39(6) 411–415. http://doi.org/10.1016/j.clae.2016.08.001,
42. Barakat, K. H., Gajewski, M. M., & Tuszynski, J. A. (2012). DNA polymerase beta (pol β) inhibitors: A comprehensive overview. Drug Discovery Today, 17(15–16) 913–920. http://doi.org/10.1016/j.drudis.2012.04.008,
43. Mocan, O., & Dumitraşcu, D. L. (2016). The broad spectrum of celiac disease and gluten sensitive enteropathy. Clujul Medical, 89(3) 335–342. http://doi.org/10.15386/cjmed-698, et al.
44. Development of limited sampling strategy for mycophenolic acid: Influence of post-transplant period and second peak. Therapeutic Drug Monitoring. 2013;
45. Boden S, Lloyd CE, Gosden C, Macdougall C, Brown N, Matyka K. The concerns of school staff in caring for children with diabetes in primary school. Wiley Online Library [Internet]. 2012 Sep [cited 2022 Jun 13];13(6):6–13. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1399-5448.2011.00780.x?casa_token=UJar2XvnlTEAAAAA:wmJ53WSuLsVTONmpIwd-

Assessing the Use of Contraceptive Methods for Family Planning among Married Women of Rawalpindi [urban]

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Abstract

Qualitative data from a survey of married women living in urban areas of Rawalpindi are presented here in an effort to better understand their views on contraceptive techniques and the factors that impact their use.

A purposeful selection strategy was used to choose participants, and only married women of childbearing age were eligible to participate. In total, 12 focus groups were held in the urban region of Rawalpindi. Some modern contraceptive methods were known to the majority, but overall use was extremely low. The prevalence of any form of contraception, including IUDs, was especially low. Modern contraception is not widely used because of concerns about side effects, religious apprehensions about harming the unborn child, a lack of information, or a lack of access to high-quality treatment according to the findings. The number of young women in the Pakistan who utilize contraception is influenced by social, demographic, and economic factors. Young women's access to contraception may be restricted unless these findings are included into public health programs. Access to family planning information and services for young women is highly recommended.

Key words: Contraceptive Methods, Family planning, Urban areas, Rawalpindi

Introduction

Population growth, particularly in emerging countries, has raised a red flag around the globe. They have met their goal of restricting development in industrialized countries, and some have even seen negative growth. Due to the rapid expansion in developing countries, this effort is hampered. India is currently the second most populous country in the world, behind China, and is expected to overtake China by 2050 at its current development pace. In Pakistan, population increase is a major problem. The demographic needs of Pakistan are clearly out of balance right now [1]. With a population of over 184 million, Pakistan is the sixth most populous country in the world but has a big problem with poverty: 61% of its population lives below the poverty line [2]. In rural areas, where 65 percent of the country's population lives, about 45 percent of the population has limited access to public and private health care services [3]. Maternal and child health are two of the country's most critical development indicators [4]. In Pakistan, an estimated 28,000 women die each year from pregnancy-related problems that may have been prevented [3]. According to the World Health Organization in 2008, Pakistan was one of six nations responsible for more than half of all maternal fatalities worldwide [4].

A mother's and her baby's health are inextricably intertwined. As much as a third of newborns in Pakistan die as a result of maternal infections and other complications associated with pregnancy and delivery [5]. The health of Pakistani women is frighteningly low, which has a negative impact on the mortality and morbidity rates of both mothers and children. Pakistani women's lifetime risk of maternal death is estimated to be one in 93 based on current studies [6]. Half of all pregnancies in Pakistan occur with a competent health provider present, and women in rural areas or with lower levels of education are less likely to seek out skilled delivery care [3]. Both maternal mortality and the rural-urban disparity are significant in Pakistan, but the rural-urban disparity is even more pronounced. Pakistan's antenatal care coverage is far from optimal, with 27 percent of pregnant women receiving no care and 40 percent receiving no postnatal care after birth [3].

Newborn health and survival should also be a top target for improvement. Since the first PDHS was conducted in the mid-1980s, the newborn mortality rate in Pakistan has remained nearly stable. Regional differences were also brought to light in this manner [7]. If you take Punjab and Sindh, the 10-year NMR is substantially higher (58 per 1,000) than NWFP and Baluchistan (53 per 1,000). (41 and 30 per 1,000, resp.). 2.34% of all fatalities are due to pregnancy-related causes, according to a 2019 analysis from the Institute for Health Metrics and Evaluation. Not utilizing contraceptives for family planning is a major contributor [8].

At 17.4%, Pakistan's Contraceptive Prevalence Rate (CPR) is lower than the world average in urban regions, and it is significantly lower in rural and slum areas, contributing to both rapid population growth and poor health outcomes. Youth in the study area are not using contraceptive methods because of myths and misconceptions, side effects, lack of proper knowledge about different contraceptives, unmet needs for contraceptives, socio-cultural and religious factors, and family planning service providers' own biases against or for use of contraceptive methods among the youth in the study area. However, it was believed that increased use of family planning techniques among the young people in the research area was linked to better education of youth and family planning service providers regarding counselling and contraceptive method use [9].

The purpose of the study was to assess the views of married women in urban areas of Rawalpindi on the usage of various contraceptive methods and to discover the factors that influence their use.

Theoretical framework

1. Methodological Orientation and Theory

The methodological orientation of this study is based on Grounded Theory.

Participant selection

2. Sampling

This study employed a purposive sample design by focussing on married women of reproductive age. FPC were selected at random from the neighbouring area. The eligible subjects were married women of reproductive age, residing in Rawalpindi.

3. Method of approach

Participants were selected non-randomly from women who visited the selected facilities for their own reasons and who requested if they can participate in an interview. A prior verbal consent was obtained from the participants before the interview. Interview questionnaires were signed afterwards for evidence and also as evidence of their consent. Efforts were maximally taken during recruiting and interviewing eligible participants in the study to avoid any potential selection or information bias.

A predesigned questionnaire was used by the investigator to interview the selected study participants. The questionnaire included sociodemographic information regarding age, education, family size, and family income, and questions covered awareness with regard to the concept and methods of family planning.

Data obtained was entered into Google forms, and analysed using qualitative analysis methods. Descriptive statistical measures such as percentages and proportions were used to express qualitative data during analysis. However, findings are narrated more in a qualitative manner.

4. Sample size

The team decided to conduct 16 interviews, 8 at most at each location. There were two different locations selected. However, 12 interviews were conducted with

married women participants in Rawalpindi area and the interviewers decided to stop the process as saturation point was reached.

5. Non-participation
The following exclusion criteria was used.

• All women who didn't wish to participate in the study were excluded.
• All unmarried women were excluded

Setting

6. Setting of data collection
The study was conducted in the urban area of Rawalpindi. Family Planning Centers (FPC) and Gynaecology Clinic at the Rawalpindi health facilities were the setting of this study.

7. Presence of non-participants
The interviews were conducted in isolation due to various questions of a sensitive nature. However, there were a few occasions, especially in the beginning, where the presence of a note taker as well a few technicians was required. However, in totality, this was a discussion between the interviewer and interviewee.

Data Collection

8. Interview guide
Interview guide was developed prior to administering the questionnaires. This helped the interviewers in asking relevant questions and keeping the interest of their respondents alive.

9. Audio/visual recording
Keeping in mind the sensitivity of the questions that were asked of respondents, the team decided not to go for audio visual recording. However, the utmost effort was employed in filling out the responses in a professional manner. All responses were discussed with the respondents after the interview for cross-verification.

10. Duration
Overall, 12 interviews were conducted with married women participants in Rawalpindi area on 10 January 2022. Each interview lasted for one hour approximately.

11. Data saturation
After 9 interviews the saturation point was quite evident, however the team decided to conduct 12 interviews.

12. Ethical Considerations
Health Services Academy, Islamabad Pakistan, gave the initiative its ethical clearance. To ensure the safety of the study participants, they were informed of the study's goal and the fact that they had the option of withdrawing from the interviews at any moment. When they were asked to answer a question, they were told that there was no "right" or "wrong" answer. This study's findings will not be reported or published without their consent, and no identifying information about them will be made public. In addition, they were told that the audio recordings and hard copies of the transcripts would be stored securely and destroyed when no longer needed. Verbal and informed consent was also obtained from the study participants prior to the start of FGDs.

Data analysis

13. Derivation of themes
Overall, the questionnaire was divided into three themes, and the questions were asked accordingly. However, the themes were more thoroughly derived during the data synthesis and information recording.

14. Software
Google forms were used as the software to enter and manage data.

Reporting

A qualitative study was done to assess the views of married women in urban areas of Rawalpindi on the usage of various contraceptive methods and to discover the factors that influence their use.

Participants Demographic Information
All women were over 30 except one who was 23. 66.66% of women interviewed came from less than a 10 km radius. 25% of them came from less than a 1 km radius area whereas 8.34% of them came from less than 1/2 km radius area. 41.66% were house hold heads whereas 58.34% were illiterate. 58.33% were office workers ans 41.67% were casual labourers. The maximum of individuals reported that contraceptives are used for family planning after giving birth to 4 children.The highest number of children is 6 and lowest is 2. (Table I).

Knowledge about Contraceptives – Uses and Access
50% of women reported to have knowledge of injections whereas 33.3% had knowledge of condoms and only 16.7% of women knew pills as methods of contraception. 33.3% of women learnt about the family planning methods from their friends and Radio And TV and health workers' advice were also a few sources narrated by the respondents making up 16.7% each. Word of mouth has more impact. 58.3% women preferred pharmacies to purchase contraceptive products. 16.7% women receive education through community health programs. Family planning clinics are also accessible but to only 25% of women. 66.7% women visit family planning clinics each month and 33.3% of them visit more than 3 times a month. 33.3% of women discuss family planning and use of contraceptives with their spouse/partner whereas 66.7% women and their spouse make a combined decision on family planning and use of contraceptives. (See Table II).

Table I: Demographics

Mean Age	33.25 Years
Locality	
10Km	8 (66.66%)
Lessthan 1 km	3 (25%)
Lessthan ½ km	1 (8.34%)
Literacy	
House Hold Heads	5 (41.66%)
Illiterate	7 (58.34%)
Employment	
Office workers	58.33%
Casual labourers	41.67%

Table II: Knowledge & side effects bout Family Planning Methods

Knowledge of injections	6(50%)
Knowledge of condoms	4(33.3%)
Knowledge of pills	2(16.7%)
Learning about Family Planning Methods	
Friends	4(33.3%)
TV	2(16.7%)
Health Care workers	2(16.7%)
Radio	4 (33.3%)
Family Planning Services	
Pharmacies	7(58.3%)
Community Health Programs	3(25%)
Family planning Clinics	2(16.7%)
Visiting Family Planning Clinics	
Each Month	8(66.7%)
More than 3 timesa month	4(33.3%)
Discussing Family Planning Services	
Spouse/partner	8(66.7%)
Combined decision	4(33.3%)
Side Effects	
Yes	10(83.3%)
No	2(16.7%)

Knowledge of Side Effects

80% of women have responded that they face side effects. Commonly reported areIrritation, Hypersensitivity, leucorrhoea, burning, itching and vaginal discharge.

One of the women responded by saying that she feels swelling in her head and body pains. Otherwise there is no disease. It is also of interest to know that none of the respondents consulted health professionals for side effects. (See Table II).

Motivational Factors

83.3% women reported having knowledge of family planning whereas only 58.3% had used a method of family planning within the last 12 months. 33.3% women reported having cultural beliefs and 41.66% women having religious beliefs about modern family planning methods. Another motivational factor affecting their decision of family planning and number of children is their spouse as 33.3% of decisions are made by them whereas 66.7% of decisions are made by both of them. (See Table III).

Table III: Motivational Factors including Likes & Dislikes in Contraceptive Use

Heard of Family Planning	
Yes	10(83.3%)
NO	2(16.7%)
Usage of family Planning Methods	
Used within the last 12 months	7(58.3%)
Not Used within the last 12 months	5(41.7%)
Family Planning Methods Affected	
Cultural beliefs	4(33.3%)
Religious beliefs	5(41.66%)
Not affected by any belief	3(25.1%)
Decision of Family Planning	
Decisions are taken by spouse	4(33.3%)
Decisions are taken by both of them	8 (66.7%)
Dislikes using contraceptive method	
Spouse doesn't agree	5(41.7%)
They are not at risk	4(33.3%)
Culturally not acceptable	3(25%)
Desire for more children	3(25%)
Husband and in laws pressure.	9(75%)
Likes using contraceptive method	
Oral Contraceptives	5(41.7%)
Conventional Contraceptives	6(50%)
Injectable contraceptives	1(8.3%)

Some of the participants responses are given below:

• My daughter is still young. At the time of delivery, the doctor had explained to my mother that there was something to be avoided.
• My mother used to say that children should be reproduced with gaps. And there should only be two children, that's why I started using condoms.
• I had heard on TV that children should have 2 years of gap. After my daughter is born, I consulted with the LHW of the area and started the tablets.
• 4 children were born in my house then I thought that (should) stop now

Dislikes in Contraceptive Use

41.7% women report spouse doesn't agree using family planning method while 33.3% women think they are not at risk. 25% of women discontinued family planning method as they had a desire for more children whereas 75% had husband and in laws pressure. (See Table III).
I

Mostly women couldn't narrate dislikes but after probing a few responded with side effects. Some of the participants responses were
• My daughter was 6 months old when I got an injection. I've been feeling breathing issues for the last 2 years now. I also get headache. I can't sleep at night. This has also impacted on my menstruation cycle.
• I have pain all over my body. My husband says it's all because of injections
• I have a stomach ache and feel like its burning.

Likes in Contraceptive Use

41.7% women preferred oral contraceptives whereas 50% women preferred conventional type ans injectable contraceptives are preferred by 8.3% as it doesn't take much efforts and carefulness.
(See Table III).

The participants responses are given below:

• I wanted that I shouldn't have children in next two years. Since I am getting and consuming these things at home therefore it is convenient and better that I don't have to go somewhere else for family planning.
• Another woman prefers injection over tablets. She said that she used to take tablets but now she is comfortable using injection as it is convenient and doesn't require everyday use.
• I have a stomach ache and feel like its burning.
• This reassures me that the pregnancy is interrupted and that I do not have to do anything on my own and naturally there is a break.

Discussion

Women were more likely than men to get married at a younger age, which is in line with national statistics that show that on average, women get married at the age of 18. Men and women both agreed that having four children, two boys and two girls, is the ideal number for a family. However, boys received the majority of the votes. Males were shown to be more interested in having children than females, according to the 2012-13 PDHS [3]. Couples who want to reduce the number of children they have should enlist the help of their spouses (husbands) in the process of choosing on a family planning strategy [10]. Making decisions about the number of children to have and whether to adopt the FP technique together is rare.

Many of the participants had some knowledge of at least one modern contraceptive technique, including condoms, which is consistent with Pakistan DHS 2012-13 data [3]. Contrary to current national data, women believed that long-acting Intrauterine Devices (IUDs) were safer and had fewer negative effects than short-term techniques such as injectables and pills. IUDs were the most generally known procedure after condoms and female sterilization. As past studies have shown, men and women in these rural areas rely heavily on word-of-mouth to learn about local events and happenings [11].

According to a study in Vellore, Tamil Nadu, many women avoid taking contraception because they want children and are concerned about the possible ill effects. Modern contraceptive use was high in this study population, despite low levels of knowledge and moderate levels of positive attitude. Modern contraceptives were seen less successful by many women who preferred the more conventional techniques. The most common modern contraceptive method for women was sterilization [12].

Similar results were shown by a rural setup study conducted in 2015 Pakistan; the majority of the population was familiar with some modern contraceptive options, although they were rarely used. The prevalence of any form of contraception, including IUDs, was especially low. Modern contraception is not widely used because of concerns about side effects, religious apprehensions about harming the unborn child, a lack of information, or a lack of access to high-quality treatments. The vast majority of people preferred private health care facilities over government-run ones [13]. However, according to research conducted in Nepal, 81.3% of women in reproductive age were utilizing a modern method of contraception. According to educational attainment, 89.5% of women and 95.1% of husbands were literate, and 91.6 percent of women were found to be active in decision-making and to have effective inter-spousal communication, which is 93.3 percent [14].

According to research conducted in Sub-Saharan Africa in 2015-2016, 30.9% of women there utilized contraception. According to the data, young women in Malawi who are married, have children, are educated, have a job, and know the ovulatory cycle are more likely to take contraceptives. Women who were 20–24 years old, married, aware of their ovulatory cycle, and with only an elementary education were more likely to use contraceptives than their counterparts were [15].

During the discussions, both positive and negative impressions about FP were documented. The good news is that women who took part in the study said that financial strain and increasing awareness were the two most important factors influencing couples to reduce their family sizes. Other factors that contributed to a lack of understanding and inhibited family planning uptake included societal influences (such as in-law and peer pressure on both genders), as well as shyness. Only a few men and women were honest about their use of contraception, whether it was recently or never. The most common reason given for not utilizing contraception was a desire to have more children

We must proceed with caution in light of the study's shortcomings, which stem primarily from its design. This is a qualitative study with a small sample size that may not accurately reflect the perspectives of the entire community it is intended to serve. It's also worth noting that this research included married couples from lower socioeconomic position who may have different perspectives than married couples from higher socioeconomic status.

Limitations:
Furthermore, the study's findings point to a lack of knowledge about various methods of family planning, a lack of health facilities offering high-quality family planning services, a lack of financial resources to access these services in rural areas, and social issues like peer pressure, mobility restrictions for women, and the disapproval of in-laws.

Long-acting and reversible contraceptives are needed in order to better understand local family planning practices, attitudes, and viewpoints. As attitudes regarding family planning and family size change, more women and couples will seek out family planning services. In order for women and couples to reach their reproductive and childbearing health goals, difficulties with access, pricing, and availability must be addressed. Both men and women expressed a desire for further children, and neither group felt the need to utilize contraception to any considerable extent.

Recommendations:
Female healthcare workers who are well-versed in long-term family planning methods like intrauterine devices (IUDs) and work in well-established institutions rather than pop-up clinics were also shown to be essential in the research. It also stressed the need of providing their communities with a man who is trained and knowledgeable about family planning and can educate other men about the advantages of family planning and birth spacing influencing decision-making at the household level.

It is possible to alter people's views on birth spacing techniques through well-targeted behaviour modification and communication efforts. Rather than allowing couples

to wait until they've reached their ideal family size before commencing contraception, these behaviour change efforts should encourage both men and women to begin using good birth spacing techniques as soon as they are married.

Efforts to promote collaborative decision-making between husband and wife about family planning and birth spacing should also include such efforts, so that spouses become responsible partners in family planning/birth spacing decisions and alleviate the burden of decision-making on women.

Through appropriate counselling and adequate information on method-related side-effects, we should be able to alleviate the anxiety of side effects. It's also possible to address social and religious concerns by incorporating community leaders, religious clergy, and health workers in awareness raising efforts.

Conclusion

Social, demographic, and economic factors influence the number of young women who use contraceptives in Pakistan. Unless these findings and their implications are incorporated in public health policies, young women's access to contraception may be restricted. It is strongly recommended that young women have improved access to family planning information and services in order to reduce the number of pregnancies among young women.

It sheds information on family planning practices, attitudes, and views in the local setting as well as the need for long-acting and reversible contraceptives. More women and couples will turn to family planning services as attitudes toward it and their intended family size shift. Access, price, and availability issues must be addressed if women and couples are to achieve their reproductive and childbearing health goals. The desire for additional children was stated virtually equally by men and women, and neither group felt the need to use contraception to any significant degree.

References

1. Tahseen AU, Naeem A. Assessment of Different Contraceptives and determinants among eligible couples attending out Patient Department of Hayat Memorial Hospital, Lahore. Esculapio - JSIMS 2022;18(01):36-41.
2. Population Reference Bureau, "World Population Data Sheet," 2013, http://www.prb.org/Publications/Datasheets/2012/world-population-data-sheet.aspx.View at: Google Scholar
3. National Institute of Population Studies (NIPS) and ICF International, Pakistan Demographic and Health Survey 2012-13, National Institute of Population Studies (NIPS), Islamabad, Pakistan; ICF International, Calverton, Md, USA, 2013.
4. UNDP, The Real Wealth of the Nations: Pathways to Human Development, 2014.
5. Z. Bhutta, G. Darmstadt, E. Ramson, A. Starrs, and A. Inker, "Basing newborn and maternal health policies on evidence," Tech. Rep., JHPIEGO, 2013.View at: Google Scholar
6. D. Anthony, The State of the World's Children 2011: Adolescence: An Age of Opportunity, United Nations Children's Fund (UNICEF), New York, NY, USA, 2011.
7. National Institute of Population Studies (NIPS) and Macro International, Pakistan Demographic and Health Survey 2006-07, National Institute of Population Studies (NIPS), Macro International, Islamabad, Pakistan, 2006.
8. GBD Compare | IHME Viz Hub (healthdata.org)
9. Nishtar NA, Sami N, Alim S, Pradhan N, Hasnain FU. Determinants of contraceptives use amongst youth: an exploratory study with family planning service providers in Karachi Pakistan. Glob J Health Sci. 2013 Jan 5;5(3):1-8. doi: 10.5539/gjhs.v5n3p1. PMID: 23618469; PMCID: PMC4776775.
10. J. Stover and J. Ross, "How increased contraceptive use has reduced maternal mortality," Maternal and Child Health Journal, vol. 14, no. 5, pp. 687–695, 2010.
11. S. K. Azmat and G. Mustafa, "Barriers and perceptions regarding different contraceptives and family planning practices amongst men and women of reproductive age in rural Pakistan: a qualitative study," Pakistan Journal of Public Health, vol. 2, no. 1, pp. 17–23, 2012.
12. Sukumar, M.B.A., John, S.M. Knowledge, Attitude and Practices of Contraceptives Among Married Women of Rural Vellore. J Obstet Gynecol India (2021). https://doi.org/10.1007/s13224-021-01552-4
13. Ghulam Mustafa, Syed Khurram Azmat, Waqas Hameed, Safdar Ali, et al. "Family Planning Knowledge, Attitudes, and Practices among Married Men and Women in Rural Areas of Pakistan: Findings from a Qualitative Need Assessment Study", International Journal of Reproductive Medicine, vol. 2015, Article ID 190520, 8 pages, 2015. https://doi.org/10.1155/2015/190520
14. Bhandari, N., Shrestha, G., & Thakuri, P. (2014). Study of factors affecting contraceptive use among married women of reproductive Age. Journal of College of Medical Sciences-Nepal, 9(4), 24–29. https://doi.org/10.3126/jcmsn.v9i4.10233
15. Mandiwa C, Namondwe B, Makwinja A, Zamawe C. Factors associated with contraceptive use among young women in Malawi: analysis of the 2015-16 Malawi demographic and health survey data. Contracept Reprod Med. 2018 Sep 20;3:12. doi: 10.1186/s40834-018-0065-x. PMID: 30250748; PMCID: PMC6146597

In Memoriam

My brother, Dr Manzoor Butt from Rawalpindi, Pakistan, died on the 8.6.2022.

He was a good and gentle man.

He was an early contributor to the MEJFM and a great family doctor. As needed he healed, fed, and provided money and safety for his patient population.

He trained Women's Health Workers and he and his wife Rahila picked up blind girls in a bad condition from the streets, and took them to the Blind Girls School in Rawalpindi where they were housed, fed and educated and given love and hope.

On a visit where I arranged some medical tests for him - he had many health problems himself - he made me his sister, under strict Islamic Guidelines.

He was a greatly loved husband, father, brother, doctor and friend.

His tireless commitments are over but while he walked this earth he did everything with grace, compassion, empathy and love.

Vale Manzoor.

Lesley Pocock

Health Literacy of Migrant Workers in Saudi Arabia: A Cross-sectional Survey

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Abstract

Background: Gulf nations employ large numbers of migrant workers. In Saudi Arabia, for example, migrant workers comprise 30% of its total population. However, the health literacy levels of these workers are reported to be low, and studies focusing on this topic are limited.

Objective: The aim of this study is to assess the level of health literacy of migrant workers in Saudi Arabia.

Methods: A convenience sample of 127 migrant workers in Saudi Arabia were surveyed using the Brief Health Literacy Screening Tool (BHLST) from September 2019 to November 2019. A comparison of the BHLST scores of the participants was performed. This study adhered to the STROBE checklist.

Key Results: Out of the 127 respondents, 28 reported experiencing health problems, such as hypertension, diabetes mellitus, back pain, hepatitis A, rheumatic disorders, allergy, headache, kidney disease, and colitis. The majority of the participants (55.12%) had inadequate overall health literacy levels, 31.50% had marginal health literacy levels, and only 13.38% had adequate health literacy levels. Among the 13.38% participants who had adequate health literacy, more Arabic-speaking individuals than their non-Arabic-speaking counterparts had adequate health literacy by percentage.

Conclusion: Overall, the findings of the study revealed that most migrant workers had inadequate or low health literacy levels, as indicated by their BHLST scores. The health authorities in Saudi Arabia and other Arab countries need to develop health literacy interventions geared toward increasing the health literacy levels of their migrant workers.

Keywords: Brief health literacy screening tool; Expatriate workers; Health literacy; Migrant workers; Saudi Arabia

Introduction

Health literacy plays an important role in addressing health challenges at a variety of levels in the international and global context (1). According to the World Health Organization, the improvement of health literacy and the achievement of the health literacy needs of the most underprivileged and marginalized societies will accelerate progress in reducing global health inequities (2). The United Nations Population Fund reports that 244 million people live outside their country of origin (3). The results of a recent study showed that 13%–30% of migrant workers are uneducated and that among hospital patients, a misunderstanding of prescription labels is common (4). Moreover, only a few studies on this topic have been conducted in the country (4,5), and no research has been done concerning the health literacy of migrant workers.

The findings of a study in the US suggest that various instruments (e.g., Rapid Estimate of Adult Literacy in Medicine, Test of Functional Health Literacy in Adults, 4-Item Brief Health Literacy Screening Tool) measure health literacy differently and are likely conceptually different (6). As healthcare providers, including physicians, often have difficulty identifying the health literacy status of their patients (7), it is imperative for healthcare providers to have a tool that accurately identifies patients who have low health literacy levels (8). In the present study, the Brief Health Literacy Screening Tool (BHLST) was used to assess the health literacy of Arabic- and non-Arabic-speaking migrant workers in Saudi Arabia.

Background

The United States Department of Health and Human Services defines literacy as a person's ability to read, write, speak, and compute and solve problems at levels necessary to function on the job and in society, achieve one's goals, and to develop one's knowledge and potential (9). The scope of health literacy is established by the Institute of Medicine (2004) in their consensus study report as the degree to which individuals have the capacity to obtain, process, and understand basic health information, and the services needed to make appropriate health decisions. The Calgary Charter on Health Literacy indicates that these skills comprise of writing, reading, speaking, listening, numeracy, and critical analysis including interaction and communication skills (10).

Basic literacy must be achieved by individuals before they can fully achieve health literacy. However, health literacy, as defined by the Institute of Medicine and the United States Department of Health and Human Services, requires a variety of other skills; studies in the US have shown that the majority of healthcare clients have a poor understanding of health and illness (11,12). About one-quarter of adults in the US have low health literacy (13). The Institute of Medicine categorizes health literacy skills into cultural and conceptual knowledge, oral literacy, print literacy, and numeracy, forming a level of competency required of successful healthcare consumers (14). As health literacy as a concept is relatively new to the Gulf states, particularly Saudi Arabia, research on it is scarce (15). Moreover, while migrant workers are considered transient residents, their health concerns and the potential effects of these on the health of the Saudi population mandate that their needs be addressed.

In a recent systematic review, it was found that as the population of the EU diversifies, new challenges on the delivery of healthcare emerge because of migrants' health literacy (16). In the Arab region, International Labor Organization reported that about 17 million people are migrant workers (17). Most of them come from Southeast and South Asian countries, such as Bangladesh, India, Nepal, Pakistan, and the Philippines (18). International Federation of Human Rights indicated that 2003As of 2003, Saudi Arabia has approximately six million migrant workers, representing more than 50% of its total working population (19); this number recently increased to 10 million (20).

Objective of the Study

The aim of this study is to assess the level of health literacy of migrant workers in Saudi Arabia. It also seeks to determine the differences in health literacy levels between Arabic- and non-Arabic-speaking participants.

Methods

Research Design

This quantitative and cross-sectional study used a questionnaire survey. The study adhered to the STROBE guidelines.

Sample and Setting

A convenience sample of 127 male migrant workers responded to the questionnaire at commercial venues in Riyadh, Saudi Arabia. The investigators randomly approached migrant workers and requested them to respond to four questions about accessing healthcare and their basic demographic data using the BHLST. Included in the study were (1) non-citizen workers, (2) those currently employed during the recruitment period, and (3) any nationality with a valid residence card. Individuals with Saudi citizenship were excluded from participating in the study.

Ethical Approval and Data Collection

After receiving ethical approval from the Institutional Review Board of a Saudi university, the researchers approached migrant workers in commercial venues to invite them to participate. Information on the study was provided to the participants, and they were given time to ask questions about the study. The privacy and confidentiality of the participants were ensured by anonymizing the data collection and obtaining the participants' informed consent. The researchers then orally read and completed the questionnaires based on the participants' responses. The data gathering period was from September 2019 to November 2019.

Instrumentation

The BHLST, a well-tested instrument developed to identify primary care clients with low health literacy skills (21), was utilized in this study. The BHLST was developed by the Veterans Administration of the United States as a screening tool for the identification of healthcare clients who have limited ability to function in primary care settings. The method of scoring in this inventory allows a possible score range of 4 to 20. The levels of health literacy are classified as inadequate (score: 4–12), marginal (score: 13–16), and adequate (score: 17–20). The reliability and validity of the tool have been established in a variety of settings and populations, and the tool has been translated into a number of languages (21,22, 23).

Data Analysis

The collected data in this study were entered into SPSS version 23.0 for data analysis. Descriptive statistics were used to fully describe the demographic variables of the migrant workers. Frequency and percentage were also calculated to determine the responses of the participants to the four items in the BHLST. A comparison of the BHLST scores of Arabic- and non-Arabic-speaking participants was performed.

Results

A total of 150 questionnaires were distributed during the recruitment period. Only 135 surveys were returned, of which eight had substantial missing data and were therefore excluded from the analyses. The response rate was 84.67%. A summary of the respondents' demographic profiles is shown in Table 1. Out of the 127 participants, the majority (40.16%) belonged to the 31- to 40-year-old group. Most respondents speak Arabic (44.88%), whereas a few speak Urdu (18.90%), Hindi (13.38%), Filipino (13.38%), and Bengali (9.45%). Most of them have been working in Saudi Arabia for five years and more (48.82%), with the highest proportion of participants working as sales personnel (25.98%).

As shown in Table 2, the majority of the participants do not wear eyeglasses (77.95%), do not report any health problems (77.95%), and seek medical consultation in clinics (56.70%). Out of the 127 respondents, 28 reported experiencing some health problems, such as hypertension (7.09%), diabetes mellitus (6.30%), back pain (1.57%), hepatitis A (1.57%), rheumatic disorders (1.57%), allergy (1.57%), headache (0.79%), kidney disease (0.79%), and colitis (0.79%).

The health literacy scores of the participants by their mother tongue, number of years in Saudi Arabia, and education are summarized in Table 3. Participants who speak the Arabic (13.18%) and Filipino (14.63%) languages and those with secondary education (13.50%) had marginal health literacy levels. Those who speak Hindi, Urdu, and Bengali had inadequate health literacy levels. Participants who are illiterate, able to read and write, and with primary education, as well as those who worked in Saudi Arabia from one year to more than five years, had inadequate health literacy levels.

The majority of the participants had inadequate overall health literacy levels (55.12%), 31.50% had marginal health literacy levels, and only 13.38% had adequate health literacy levels. A comparison of the health literacy between Arabic and non-Arabic-speaking participants showed that the majority of both groups had inadequate health literacy levels, whereas only 15.79% of the Arabic speakers and 11.23% of the non-Arabic speakers had adequate levels of health literacy (Table 4).

Table 1. Demographic Profile of the Respondents (N = 127)

Demographic Profile	f	%
Age (years)		
21–30	37	29.13
31–40	51	40.16
41–50	22	17.32
51–60	17	13.39
Mother Tongue		
Arabic	57	44.88
Urdu	24	18.90
Hindi	17	13.38
Filipino	17	13.38
Bengali	12	9.45
Number of Years in Saudi Arabia		
1–2 years	27	21.26
3–4years	38	29.92
5 years and above	62	48.82
Education		
Illiterate	11	8.66
Read and Write	29	22.83
Primary	33	25.98
Secondary	54	42.52
Occupation		
Sales	33	25.98
Maintenance	22	17.32
Construction	15	11.81
Driver	15	11.81
Cleaner	14	11.02
Laborer	12	9.45
Tailor	8	6.30
Waiter	8	6.30

Table 2. Health Problem Profile of the Respondents (N = 127)

Health Problem Profile	f	%
Wears Eyeglasses		
Yes	28	22.05
No	99	77.95
Presence of Health Problems		
Yes	28	22.05
No	99	77.95
Self-reported Health Problems		
Hypertension	9	7.09
Diabetes mellitus	8	6.30
Back pain	2	1.57
Hepatitis A	2	1.57
Rheumatic disorders	2	1.57
Allergy	2	1.57
Headache	1	0.79
Kidney disease	1	0.79
Colitis	1	0.79
Medical Facility for Consultation		
Clinic	72	56.70
Pharmacy	37	29.13
None	18	14.17

Table 3. BHLST Scores of the Respondents (N = 127)

Selected Demographic Profile	Score
Mother Tongue	
Arabic	13.18
Hindi	12.53
Urdu	9.96
Filipino	14.63
Bengali	10.50
Number of Years in Saudi Arabia	
1–2 years	12.89
3–4 years	12.29
5 years and above	12.13
Education	
Illiterate	8.64
Read and write	11.38
Primary	12.26
Secondary	13.50

Table 4. Overall BHLST Scores of Arabic vs. Non-Arabic Speakers by Percentage

Health Literacy Level	BHLST Score	Arabic	Non-Arabic	Overall
Inadequate	4–12	48.82	60.00	55.12
Marginal	13–16	35.43	28.57	31.50
Adequate	17–20	15.75	11.23	13.38

Discussion

This study assessed the levels of health literacy of migrant workers in Saudi Arabia using the BHLST. Based on the BHLST scores, a large proportion of the study sample is not capable of communicating with and utilizing healthcare providers as well as navigating the healthcare system at optimum levels in Saudi Arabia. The important findings revealed by the study would inform health authorities about migrant workers' level of health literacy, which could lead to the creation of a health literacy program in the country.

The results indicated that only 13.38% of the participants had adequate levels of health literacy, a few had marginal levels of health literacy, and the majority had inadequate overall levels of health literacy. The reason for this result could be linked to the low level of education of the participants; most of them never reached the secondary level of education. Similarly, a systematic review of 85 US studies with 31,129 subjects reported the prevalence of a low health literacy level between 0% and 68%, and this was associated with age, ethnicity, and level of education (24). Having a low level of education, especially below the secondary level, has been related to having inadequate or low levels of health literacy (5, 25, 26).

In particular, the results are comparable to those of a recent study conducted in Saudi Arabia in which out of the 3,557 residents surveyed, approximately half were classified as having low health literacy (5,7). However, the results obtained by Alkhadi et al, contradict those of this study; in their research, out of 123 participants, 84.4% had adequate health literacy (27). The contradictory results could be attributed to the disparity in educational level of the two studies. In this study, most participants had a below secondary level of education, whereas in the other study, most of the participants were between the high school and college levels (5,27). These observations were also reported in previous studies, so it is important to further evaluate the utility of the BHLST in various patient populations, such as that in the present study, including those with low health literacy (14,28). Moreover, in a recent study in Catalonia, Spain, 84.6% of the 2,433 research participants showed sufficient health literacy (25). However, the results of the present study are supported by the research conducted by Bishop et al, in which Spanish participants were found to have inadequate literacy in terms of the ability to read medical materials (29). Meanwhile, the results of a study in Bangladesh showed that a low level of health literacy was reported by the majority of its 1,500 respondents (30). Furthermore, the results are supported by those of Das et al, in which Bengali-speaking workers had a BHSLT score of only 10.50, indicating inadequate health literacy (30).

In the present study, the results revealed that the participants who have been working in Saudi Arabia for five years and more, who comprise the majority of this population, had lower BHLST scores than those who have been working in the country for less than five years. Additionally, Hindi- and Urdu-speaking participants reported inadequate health literacy, whereas Arabic- and Filipino-speaking participants showed marginal health literacy. Moreover, given that approximately one in four participants wears eyeglasses, indicating insufficient vision, a verbal way of determining health literacy is warranted among migrant workers in Saudi Arabia. This result is consistent with those of previous studies suggesting the greater importance of having a verbal screening tool that does not depend on vision or reading fluency (28, 31). Most participants in this study reported having health problems and sought medical consultation in clinics in Riyadh, Saudi Arabia. Most of them do not have access to hospitals because it is not covered by their health insurance from their employers. According to Alkhamis and Miraj that the despite enormous positive developments in the field of healthcare in Saudi Arabia, such as the introduction of a compulsory health benefit scheme for all (e.g., health insurance), little is known about the association between the demographic characteristics and health status of uninsured migrant workers in Saudi Arabia (32). In the same study, the results showed that the demographic profiles, including age, education, nationality, and language, of expatriate workers are associated with their health status, which could affect their health insurance (16,31).

Additionally, the participants of the present study claimed that while having medical consultation at private clinics, they could not understand the language (English) used in communicating with them as well as the medical terms used. About a quarter of the participants also reported having health problems, such as hypertension, diabetes mellitus, back pain, hepatitis A, rheumatic disorders, allergy, headache, kidney disease, and colitis. These results are contradictory to those of a previous study in which the majority of older adult participants in Greece, Hungary, and the Netherlands had either single or multiple reported health problems (33). The contradictory findings may be attributed to the fact that older adults present more health problems as a result of their advancing age (32,34), whereas the majority of the participants in the present study are young adults aged between 31 and 40 years old. Our results are comparable to those of a previous study in Lebanon in which the mean age of the study sample was 37.5 years; however, most of the participants in such study were educated, as they completed university degrees, and they reported higher levels of health literacy (15).

Specifically, this study also compared the health literacy level between Arabic- and non-Arabic-speaking participants. Collectively, non-Arabic-speaking workers accounted for the majority (55.12%) of the study participants, whereas Arabic-speaking participants accounted for 44.88% of the sample. The results showed that the majority of both groups of participants had inadequate levels of health literacy. Subsequently, the overall results indicated that migrant workers in Riyadh, Saudi Arabia had inadequate health literacy levels. Only a few Arabic-speaking (15.79%) and non-Arabic-speaking (11.23%) participants

had adequate health literacy levels. Based on the results, more Arabic-speaking participants had adequate health literacy than their non-Arabic-speaking counterparts. Overall, only 13.38% had adequate health literacy, a result that is similar to that of another study in which out of 406 participants, only 13.7% had adequate health literacy levels (35). A few underlying reasons could be related to the participants' low level of education, having occupations not related to the health and science fields, and difficulties speaking and understanding English and medical terms. These language and knowledge barriers related to the inadequacy of health literacy among migrant workers could lead to their poor access to health services and reduced health outcomes. Such underlying reasons are supported by a recent case study in which migrant health workers who received health information from health professionals and staff showed higher health literacy levels compared with general migrants in Thailand (36). In another study, the variations in the use of instruments measuring health literacy were examined, and increased age, low education, a minority status, and a self-reported poor reading level were found to be associated with low health literacy depending on the instrument used (21). Additionally, a study in Australia reported that the healthcare team must consider the communication style of migrants from culturally diverse backgrounds in seeking and accessing healthcare, which could affect the delivery of care and health outcomes (37). The lack of linguistic harmony between healthcare providers and patients serves as a considerable barrier to the delivery of care in Saudi Arabia (38). Lastly, the widespread healthcare illiteracy among ethnic communities poses the burden of language and cultural barriers, in which available data suggest that health literacy may be a stronger predictor of health outcomes than socioeconomic factors, such as education level, employment, income, and race/ethnicity (39).

Limitations of the Study

The sample of this study represents a wide variety of occupations and ages. However, all participants are males and may not be representative of the needs of female migrant workers. The sample is a relatively small convenience sample because of the limited access to this minority population and may not represent a proportional distribution of the demographic characteristics of the country's entire expatriate population.

Conclusion

Overall, most migrant workers in this study had inadequate or low levels of health literacy, as indicated by their BHLST scores. Furthermore, although this group accounted only for less than a quarter of the total number of participants, the comparison analysis showed that more Arabic-speaking participants had adequate health literacy compared with their non-Arabic-speaking counterparts by percentage. These results serve as a call for health authorities in Saudi Arabia and those in other Arab countries to develop health literacy interventions geared toward increasing the levels of health literacy of migrant workers. Correspondingly, other countries in the world can benefit from the results, especially those that have minority migrant workers with low levels of health literacy and whose nationalities are similar to those studied in this work.

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References

1.Levin-Zamir, D., Leung, A. Y. M., Dodson, S., & Rowlands, G. (2017). Health literacy in selected populations: Individuals, families, and communities from the international and cultural perspective. Information Services & Use, 37(2), 131-151.

2. WHO CO. World health organization. Responding to Community Spread of COVID-19. Reference WHO/COVID-19/Community_Transmission/2020.1. 2020 Apr.

3. Tolan NV. Health literacy and the desire to manage One's own health. Clinics in laboratory medicine. 2020 Mar 1;40(1):1-2.

4. Alburikan KA, AbuAlreesh A, Alenazi M, Albabtain H, Alqouzi M, Alawaji M, Aljadhey HS. Patients' understanding of prescription drug label instructions in developing nations: The case of Saudi Arabia. Research in Social and Administrative Pharmacy. 2018 May 1;14(5):413-7.

5.Almubark R, Basyouni M, Alghanem A, Althumairi N, Alkhamis D, Alharbi LS, Alammari N, Algabbani A, Alnofal F, Alqahtani A, BinDhim N. Health literacy in Saudi Arabia: Implications for public health and healthcare access. Pharmacology Research & Perspectives. 2019 Aug;7(4): e00514.

6. Costa GM, Gazola AC, Madóglio FA, Zucolotto SM, Reginatto FH, Castellanos L, Ramos FA, Duque C, Schenkel EP. Vitexin derivatives as chemical markers in the differentiation of the closely related species Passiflora alata Curtis and Passiflora quadrangularis Linn. Journal of Liquid Chromatography & Related Technologies. 2013 Apr 1;36(12):1697-707.

7.Bass III PF, Wilson JF, Griffith CH, Barnett DR. Residents' ability to identify patients with poor literacy skills. Academic Medicine. 2002 Oct 1;77(10):1039-41.

8.Louis AJ, Arora VM, Press VG. Evaluating the brief health literacy screen. Journal of general internal medicine. 2014 Jan;29(1):21-.

9. Chen X, Hay JL, Waters EA, Kiviniemi MT, Biddle C, Schofield E, Li Y, Kaphingst K, Orom H. Health literacy and use and trust in health information. Journal of health communication. 2018 Aug 3;23(8):724-34.

10. Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, Fullam J, Kondilis B, Agrafiotis D, Uiters E, Falcon M. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). European journal of public health. 2015 Dec 1;25(6):1053-8.

11. Johnson A. Health literacy, does it make a difference?. Australian Journal of Advanced Nursing, The. 2014 Mar;31(3):39-45.

12. Swavely D, Vorderstrasse A, Maldonado E, Eid S, Etchason J. Implementation and evaluation of a low health literacy and culturally sensitive diabetes education program. Journal for Healthcare Quality. 2014 Nov;36(6):16-23.
13. Rajah R, Hassali MA, Murugiah MK. A systematic review of the prevalence of limited health literacy in Southeast Asian countries. Public Health. 2019 Feb 1;167:8-15.
14. Wallston KA, Cawthon C, McNaughton CD, Rothman RL, Osborn CY, Kripalani S. Psychometric properties of the brief health literacy screen in clinical practice. Journal of general internal medicine. 2014 Jan;29(1):119-26.
15. Fadda M, Kanj M, Kabakian-Khasholian T, Johannes Schulz P. Validation of three Arabic health literacy assessment tools in Lebanon. Health Promotion International. 2018 Apr 1;33(2):261-7.
16. Ward M, Kristiansen M, Sørensen K. Migrant health literacy in the European Union: A systematic literature review. Health Education Journal. 2019 Feb;78(1):81-95.
17. Talukdar D, Seenivasan S, Cameron AJ, Sacks G. The association between national income and adult obesity prevalence: Empirical insights into temporal patterns and moderators of the association using 40 years of data across 147 countries. PloS one. 2020 May 13;15(5): e0232236.
18. Wahab A. The outbreak of Covid-19 in Malaysia: pushing migrant workers at the margin. Social Sciences & Humanities Open. 2020 Jan 1;2(1):100073.
19. Kapiszewski A. Arab versus Asian migrant workers in the GCC countries. InSouth Asian migration to gulf countries 2017 Sep 19 (pp. 66-90). Routledge India.
20. Williams S, Qiu W, Al-awwad Z, Alfayez A. Commuting for women in Saudi Arabia: Metro to driving-Options to support women employment. Journal of Transport Geography. 2019 May 1;77:126-38.
21. Haun J, Luther S, Dodd V, Donaldson P. Measurement variation across health literacy assessments: implications for assessment selection in research and practice. Journal of health communication. 2012 Oct 1;17(sup3):141-59.
22. Wallace LS, Rogers ES, Roskos SE, Holiday DB, Weiss BD. Brief report: screening items to identify patients with limited health literacy skills. Journal of general internal medicine. 2006 Aug;21(8):874-7.
23. Wallston KA, Cawthon C, McNaughton CD, Rothman RL, Osborn CY, Kripalani S. Psychometric properties of the brief health literacy screen in clinical practice. Journal of general internal medicine. 2014 Jan;29(1):119-26.
24. Paasche-Orlow MK, Parker RM, Gazmararian JA, Nielsen-Bohlman LT, Rudd RR. The prevalence of limited health literacy. Journal of general internal medicine. 2005 Feb;20(2):175-84.
25. Garcia-Codina O, Juvinyà-Canal D, Amil-Bujan P, Bertran-Noguer C, González-Mestre MA, Masachs-Fatjo E, Santaeugènia SJ, Magrinyà-Rull P, Saltó-Cerezuela E. Determinants of health literacy in the general population: results of the Catalan health survey. BMC public health. 2019 Dec;19(1):1-2.
26. Hawkins M, Gill SD, Batterham R, Elsworth GR, Osborne RH. The health literacy questionnaire (HLQ) at the patient-clinician interface: a qualitative study of what patients and clinicians mean by their HLQ scores. BMC health services research. 2017 Dec;17(1):1-5.
27. Alburikan KA, AbuAlreesh A, Alenazi M, Albabtain H, Alqouzi M, Alawaji M, Aljadhey HS. Patients' understanding of prescription drug label instructions in developing nations: The case of Saudi Arabia. Research in Social and Administrative Pharmacy. 2018 May 1;14(5):413-7.
28. Louis AJ, Arora VM, Press VG. Evaluating the brief health literacy screen. Journal of general internal medicine. 2014 Jan;29(1):21-.
29. Bishop WP, Craddock Lee SJ, Skinner CS, Jones TM, McCallister K, Tiro JA. Validity of single-item screening for limited health literacy in English and Spanish speakers. American journal of public health. 2016 May;106(5):889-92.
30. Das S, Mia MN, Hanifi SM, Hoque S, Bhuiya A. Health literacy in a community with low levels of education: findings from Chakaria, a rural area of Bangladesh. BMC Public Health. 2017 Dec;17(1):1-0.
31. Press VG, Shapiro MI, Mayo AM, Meltzer DO, Arora VM. More than meets the eye: relationship between low health literacy and poor vision in hospitalized patients. Journal of health communication. 2013 Dec 4;18(sup1):197-204.
32. Alkhamis AA, Miraj SS. Association between demographic characteristics and health status of uninsured expatriate workers in Saudi Arabia. Bioscience Biotechnology Research Communications. 2016 Oct 1;9(4):587-95.
33. De Wit L, Karnaki P, Dalma A, Csizmadia P, Salter C, De Winter A, Meijering L. Health literacy in the everyday lives of older adults in Greece, Hungary, and the Netherlands. International journal of environmental research and public health. 2020 Jan;17(7):2411.
34. Stineman MG, Zhang G, Kurichi JE, Zhang Z, Streim JE, Pan Q, Xie D. Prognosis for functional deterioration and functional improvement in late life among community-dwelling persons. PM&R. 2013 May 1;5(5):360-71.
35. Ylitalo KR, Meyer MR, Lanning BA, During C, Laschober R, Griggs JO. Simple screening tools to identify limited health literacy in a low-income patient population. Medicine. 2018 Mar;97(10).
36. Kosiyaporn H, Julchoo S, Sinam P, Phaiyarom M, Kunpeuk W, Pudpong N, Suphanchaimat R. Health literacy and its related determinants in migrant health workers and migrant health volunteers: a case study of Thailand, 2019. International journal of environmental research and public health. 2020 Jan;17(6):2105.
37. Zwi KJ, Woodland L, Kalowski J, Parmeter J. The impact of health perceptions and beliefs on access to care for migrants and refugees. Journal of Cultural Diversity. 2017 Sep 1;24(3).
38. Almutairi KM. Culture and language differences as a barrier to provision of quality care by the health workforce in Saudi Arabia. Saudi medical journal. 2015;36(4):425.
39. Nierengarten MB. Health literacy: A challenge in diverse populations. Contemporary Pediatrics. 2018;35(1):19-22.

Assessment of Female's Decision Regarding Family Planning and Associated Factors in Tehsil Sohawa, Punjab, Pakistan

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Abstract

Family planning enables individuals and couples to anticipate and acquire their planned number of children including the spacing and timing of their births. It's achieved by the use of birth control methods and the treatment of involuntary infertility. It demonstrates that the Pakistan family planning program has been unable to work efficiently. To understand the constraints, academics are seeking to focus on reasons behind service delivery failures, cultural restrictions, and other relevant aspects. Furthermore, the Pakistan authorities have serious worries such as the socio-economic consequence of unrestrained population increase. The purpose of the study is to illustrate the factors influencing female's decision regarding family planning. A cross-sectional study was conducted in Tehsil Sohawa, Punjab between August 2020 and December 2020. A data set of 210 individuals was obtained from Tehsil Sohawa, Punjab, Pakistan. The researcher administered questionnaire was adopted for data collection. The study results showed that female's decision on family planning was mostly affected by education level, household structure, insufficient information about family planning as well and fear of unfavorable impacts of contra conception, and counseling services played a vital part in decision making related family.

Keywords: Counseling services, Education, Family planning, Female's decision

Introduction

Birth control isn't the main aspect of family planning. Pregnancy can be managed with a variety of treatments to avoid conception while maintaining a normal life and protecting oneself from sexually transmitted infections (STDs) through family planning [2]. Changing family size, birth spacing, and education levels of women may all have an effect on children's health, and family planning initiatives have boosted socioeconomic opportunity. Also, unintentional infertility can be treated using contraceptive methods [2, 3]. Women and their families, especially children, benefit from family planning. As a result of better care and education for children, families can dedicate more time, energy and resources to fewer children [4]. Planned parenthood is becoming a vital part of nearly every health program [5] in existence today. One reason for the focus on family planning in developing countries by many non-governmental organization (NGOs) and donor agencies, such as USAID and WHO, is that it is an important public health issue for these countries [6].

There is a strong link between family planning and the growth of a nation, which is why new methods are constantly being created and existing ones are being improved [7]. In the reproductive years, family planning is a widespread and essential service for women. According to the 2002 National Survey of Family Growth, 42 percent of women aged 15–44 received family planning services from a medical practitioner in the prior year. These programs are especially beneficial to young ladies. 63% of women aged 20-24 and 55% of women aged 25-29 had used birth control in the last year [9]. Women who want to become pregnant will need to undergo these procedures in order to get there. Women's reproductive health is dependent on these services. In order to have two children, the average woman must avoid pregnancy for nearly three decades of her reproductive life in order to achieve this low fertility level [10]. Even though family planning is widely used and widely available, little is known about the quality of these services (11), despite their importance and widespread use. There is a pressing need for greater research on the issue of health-care quality in the United States, which is fueled by the public's interest in and attention to this topic. For the family planning industry, it's essential to determine if there are any quality concerns [12] and design ways to fix them. It is essential to learn more about the quality of family planning services since patients have a fundamental right to high-quality care. [3]. Contraception and reproductive outcomes are influenced by how successful family planning services are, according to this research. Study after study has found that the quality of family planning services has long been a subject of inquiry and intervention in a range of international contexts where the quality of family planning services has long been a concern. Unplanned pregnancies and the failure of contraception are both big challenges in the United States. More than half of all pregnancies in the United States each year are unplanned, and almost half of those pregnancies occur among women who were using some kind of contraception at the time of conception [14]. 9 percent of women who use reversible contraceptive methods had a failure in the first year, and 17 percent in the first 24 months, respectively. There are several contributing reasons to these problems, but the quality of family planning services is one of them [15].

In addition, poor-quality services may prevent clients from acquiring the information or skills they need to adopt and maintain healthy contraceptive practices [16]. Policies and rules have an impact on the quality of service as well. While all providers of family planning services are not governed by the same set of rules, there are some criteria for some providers [17]. When it comes to family planning, those with limited financial resources must adhere to specific guidelines [18]. It is imperative that clients have access to a wide range of safe and effective contraception options, that the services they get are completely voluntary, and that they are treated with respect. Planned Parenthood clinics follow a similar set of quality standards when providing their services to their clients. Due to the expensive cost of raising a child, it is imperative that family size is proportionate to the family's resources so that life can run smoothly. There is evidence to suggest that families are more likely to believe that they are receiving enough assistance for their children than they are for their homes. Customer satisfaction with primary service providers' abilities to meet their child's specific needs and provide information on services is generally high, with lower satisfaction ratings for the providers' ability to meet their child's specific needs and provide information on services. The financial well-being of participants' families was frequently more important to them than their own psychological well-being. To conclude, we discovered that service adequacy ratings predicted family quality of life, with partnerships modulating the impact [19]. Quality standards can also be taught to private businesses by professional organizations. [18] The Association of Reproductive Health Professionals and the American College of Obstetricians and Gynecologists both offer clinical practice and service delivery guidelines and recommendations.

As a result of this focus on women, the bulk of services, including research and communication efforts, have emphasized women [20]. Family planning has been challenged by this new research, which shows that the male is just as important as the female in this process [21]. When it comes to pregnancy, contraception, and abortion, women in underdeveloped countries are typically not the major decision-makers. For example, in patriarchal cultures where sociocultural traditions dictating gender norms, home social expectations and communication styles hinder female decision-making abilities [22]. In terms of reproductive health, men and women appear to make distinct choices, as evidenced by recent studies. They realized that men were the most powerful. Women's ability to achieve their reproductive goals may be hampered by household power imbalances, which are taken into account in family planning programs [23].

Promoting family planning has the ability to reduce poverty and hunger while also saving 32% of all maternal deaths and roughly 10% of all child deaths in countries with high population expansion. Among other things, it would help women's empowerment, universal primary education, and long-term environmental sustainability. There has been a huge increase in contraceptive use from less than 10% to 60% and a decrease in the number of births per woman in poor countries from six to three. In the 75th percentile of the world's poorest countries, the usage of contraception is still low, and fertility rates are high. In addition, guys should be educated on how to discuss reproductive issues with their partners. Couples' reproductive decision-making is uneven, with the spouse predominating, according to the findings. It is possible for women to suffer as a result of unequal gender relations since they have to obey their husbands. Health and social and economic consequences might result from a lack of negotiating power for women. Females' ability to make informed decisions about their sexual and reproductive health is often cited as a major problem in many countries, as is the lack of access to suitable contraception options for many women [24]. Despite the fact that most mothers prefer to have fewer children, it is illegal for them to exercise this choice. There's a long-held belief among mothers that having a son is a prerequisite for having enough children. The number of women who plan their own families is just 18 percent [25], and studies show that factors such as a spouse's educational level, the length of their marriage, and the husband's acceptability all have a role in this decision [26]. Nearly half of Oman's households are headed by men, according to a new survey [20]. Men's participation in family planning programs and women's empowerment is critical, because it is associated to better reproductive healthcare outcomes, such as contraceptive use and healthy living behaviours [27]. Lack of knowledge about contraceptive use and where to obtain contraceptives, medical issues, religious restriction, spouse reluctance, and poor male engagement are all cited as reasons for the low coverage of family planning services [28]. Therefore, it is especially vital in societies where men predominate, where men already have a significant role in the family and in society at large [30]. Women are typically in control of family planning in the majority of cultures around the world. It is not uncommon for them to be deprived of decision-making power and control over their own fertility goals.

The current study is designed to find solutions to several questions based on the described concerns; a brief description of the issues is as follows:

Question 1: How does family planning counseling contribute to family planning decision?

Question 2: What is the mediating role of knowledge between family planning counseling and female's decision-making regarding family planning?

Question 3: What is the moderating role of education between family planning counseling and knowledge about family planning?

Significance of the study

Research in Pakistan's Tehsil Sohawa is focused on determining what factors influence family planning behaviours. Although many studies are conducted in Pakistan, there are relatively few in the region. In order to address the fundamental causes of the problem, it's essential to identify them at the grassroots level first. It is hoped that the findings of this study will help healthcare professionals and researchers devise new approaches to improving access to family planning counselling services and educating women about their options for contraception.

Research Objectives

The study's research objectives are listed below:

1. To evaluate the effect of family planning counseling services and their contribution to the family planning decision.
2. To determine the role of knowledge in moderating the relationship between family planning counseling and female's decision-making regarding family planning.
3. To find out the moderating role of education between family planning counseling and knowledge about family planning.

Family Planning Counseling

Family planning counseling is an important part of preventing unintended pregnancies. Adequate family planning counselling is defined as information offered to women and men of reproductive age regarding the use, application, effectiveness, side effects, and contraindications of various family planning methods [31].

Knowledge about family planning

Acquiring knowledge about family planning is a crucial step toward having access to contraceptive methods and using one that is appropriate for you in an efficient and accurate manner [32].

Female's decision-making regarding family planning

Women's decision-making capacity in family planning is described as a female's aptitude toward independent decisions making or discuss family planning requirements and options with her partner [33].

Level of education

The impact of educational attainment on contraceptive and family planning information, as well as the methods utilized for family planning [34].

Methodology

The goal of this study was to examine the impact of family planning counselling services on women's family planning decisions, with the mediating role of family planning knowledge and the moderating effect of education level. Described above is the procedure to be followed during the course of the investigation. Research design, demographics, sample selection and analysis, as well as data collection methods, equipment development, and data analysis are all addressed.

Research Design
The present study analyses the role of family planning counseling services on female's decision-making regarding family planning. Knowledge's influence on family planning management has also been investigated. In addition, the function of knowledge about family planning in moderating the relationship between family planning counseling services and female family planning decision-making was explored. The moderating role of level of education in the relation between family planning counseling services and of knowledge about family planning also investigates. All the variables are measured through adapted questionnaire. The data was collected from the general public of Tehsil Sohawa, Punjab, Pakistan.

Type of Study
This cross-sectional study is conducted to assess the impact of Family planning counseling on female's decision-making regarding family planning and it has been examined with the mediating role of knowledge about family planning and moderating role of level of education. All variables were measured through self-reported questionnaires from female respondents during August 2020 to December 2020 in Tehsil Sohawa.

Time Horizon
The data collection for this study was conducted in time lags of over a six-month period. The data gathering for this study was done in such a way that, data gathering bolsters the consistency of respondents' input and, as a result, their degree of participation in the study.

Research Interference
There was no or minimal research interference that influenced the study's findings. The research is based on a field study with no or limited research influence. A self-administered questionnaire was used to obtain data from 210 respondents. Self-administered questionnaires are justified as a survey technique because they allow respondents to complete questionnaires more simply and take their time to offer acceptable and well-considered replies. The questionnaire was accompanied by a cover letter stating that the study's objective is purely academic and that it attempts to clarify the role of female decision-making in family planning. To test the mediating and moderating effects, data was obtained from 210 respondents at various time intervals. The responders completed all surveys completely and accurately. No questionnaire was improperly filled and was never discarded.

Population
The population for this study was the married females from the rural area of Tehsil Sohawa, Punjab, Pakistan. Sohawa is in the north-western part of Jhelum district, Punjab, on the subcontinental Grand Trunk Road (GT Road) between Gujar Khan and Dina.

Sampling techniques
In order to get our data, we employed a straightforward random sampling strategy. On the basis of geographical dispersion, a single site was selected and one residence was selected to begin our sample according to my criteria. On the other hand, each house was systematically questioned until the sampling was complete and met our inclusion criteria. On the basis of the population's size and convenient sampling, the data collection from married females was carried out using self-reported questionnaires at regular intervals over a period of time. Interviews and questionnaires had to be included in the minimum sample size of 210. When data on female reproductive health decisions, knowledge of family planning, access to family planning services, and educational attainment were collected, it was six months from August 2020 to December 2020. To protect the respondent's privacy, a cover letter was included with the submission. The nonprobability sampling technique was applied in this investigation, allowing for convenient sampling. Individuals, such as married women from middle-class families in District Sohawa, were the focus of this study.

Ethical consideration
Ethical consideration included a consent document was signed following a verbal explanation as an ethical factor. The information gathered was kept confidential. If they did not wish to participate or continue with the research, all of the respondents were offered a free hand. The respondents' names were not required in the questionnaire so that they could freely share their personal information.

Scales and Measures:
Data was collected through self-administered questionnaire. All the study variables except Level of education, was measured on a 5-point Likert scale ranging from Strongly Disagreed=1 to strongly agree=5. There were some demographics such as gender, and level education.

There was only one independent variable in this study which was Family planning counseling services.

Measures of family planning counseling:
Family planning counseling variable was measured using 3-itmes scales. Sample questions were: "1. Are you facilitated with family planning services? 2. Does the Family planning team visit you? 3. Are you satisfied with family planning counseling services in your area?"
There was only one dependent variable in this study that is female's decision-making regarding family planning.
Measures of female's decision-making regarding family planning:
This variable was also be measured using 3-itmes scale. The outcome variable was measured categorically as decision made by wife or any other family member [34]. Sample questions were: "1. Do you yourself make most of the decisions of your family? 2. Does other's decisions affect your family planning decision? 3. Does your family structure force you to have more children?"

Mediating variables:
There was one mediating variable in this study that is knowledge about family planning.

Measures of knowledge about family planning:
Knowledge about family planning was measured using 3-items scale. The impact of education on family planning

decision and use of contraceptive methods [36]. Sample questions were: "1. Have you ever heard about family planning? 2. Have you ever practiced any of the family planning methods? 3. Do you know different methods of contraceptives?"

Moderating variables:
The current study haad one moderating variable which is level of education.
Measures of level of education:
Measuring scale of the moderator was measured using demographic questions asking the education level. The question was: What is your education? 1. Below Matric 2. Matric 3. Intermediate 4. Bachelors 5. Masters and above.

Data analysis procedure
The SPSS 20.0 program was used to examine the data. The Preacher and Hayez technique were used for mediation analysis. To obtain the findings, an overall analysis such as regression, correlation, reliability, and validity, as well as mediation moderation, was performed.

Control variables:
During regression analysis, demographic factors were adjusted using one-way ANOVA.

Demographics:
The demographics of respondents, such as their qualification or level of education, were also collected in the current study in order to achieve more reliable and exact results. According to [7], demographics are critical while doing regression analysis. In the current study, regression analysis was used for demographics interpretation. Moreover, the results of ONE-WAY ANOVA demonstrates that these variables have no influence on the hypothesized model.

Demographic question:
The summary of demographic variable which includes level of education is explained in the following sections. The qualification distribution of target group revealed that, out of 210 participants, 63(30%) were below matric, 45(21.4%) matric, 19(9%) intermediate, 68(32.4%) bachelor, and only 15(7.1%) were masters and above.

Reliability analysis:
The variables' reliability included in this model are included in the reliability analysis. Where ethical family planning counseling services having .874, knowledge about family planning shows, .935, and female's decision-making regarding family planning shows .878 Cronbach's Alpha reliability.

Data analysis procedure:
The data is first checked for missing values. The data is examined for outlier analysis after ensuring that there are no missing values in the data. Secondly, the data is examined for reverse coded questions. The reliability analysis was then conducted in the following stage to confirm that the scales were consistent. Finally, a frequency distribution analysis was conducted, as well as a review of demographic data. Descriptive statistics , correlation, and regression analysis were utilized to offer a complete picture of the data.

Respondent level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below matric	63	30.0	30.0	30.0
	Matric	45	21.4	21.4	51.4
	Intermediate	19	9.0	9.0	60.5
	Bachelor	68	32.4	32.4	92.9
	Master or above	15	7.1	7.1	100.0
	Total	210	100.0	100.0	

Results

Descriptive Statistics

The analysis includes the summary of demographics, decisions regarding family planning, knowledge/ information about family planning, family planning counseling services/centers and their role, knowledge about contraceptives methods, and level of education.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Are you facilitated with family planning services?	210	1.00	5.00	4.0762	1.44564
Does the Family planning team visit you?	210	1.00	5.00	3.9381	1.34163
Are you satisfied with family planning counselling services in your area?	210	1.00	5.00	3.8429	1.53089
Have you ever heard about family planning?	210	1.00	5.00	4.1143	1.39935
Have you ever practiced any of the family planning methods?	210	1.00	5.00	4.1095	1.34214
Do you know different methods of contraceptives?	210	1.00	5.00	4.0857	1.31327
Do you yourself make most of the decisions of your family?	210	1.00	5.00	3.9286	1.45083
Do others' decisions affect your family planning decision?	210	1.00	5.00	4.0190	1.38675
Does your family structure force you to have more children?	210	1.00	5.00	3.9857	1.46238
Valid N (listwise)	210				

Correlations Analysis

Correlation analysis is used to determine whether the variables are statistically significantly correlated. The results are listed in the table below.

Table 2. Correlations Analysis

		Female's decision-making regarding family planning	Knowledge about family planning	Family planning counseling services	Respondent level of education
Female's decision-making regarding family planning	Pearson Correlation	1	.878**	.776**	-.230**
	Sig. (2-tailed)		.000	.000	.001
	N	210	210	210	210
Knowledge about family planning	Pearson Correlation	.878**	1	.789**	-.234**
	Sig. (2-tailed)	.000		.000	.001
	N	210	210	210	210
Family planning counseling services	Pearson Correlation	.776**	.789**	1	-.257**
	Sig. (2-tailed)	.000	.000		.000
	N	210	210	210	210
Respondent level of education	Pearson Correlation	-.230**	-.234**	-.257**	1
	Sig. (2-tailed)	.001	.001	.000	
	N	210	210	210	210

**. Correlation is significant at the 0.01 level (2-tailed).

4.3. Regression Analysis

```
Model: 1
   Y: A (Family planning counseling services)
   X: C (Female's decision-making regarding family planning)
   W: Education
Sample
Size: 210
**************************************************************************

OUTCOME VARIABLE:
 A

Model Summary
       R      R-sq       MSE         F       df1       df2         p
   .7905     .6249     .5721   114.3908    3.0000   206.0000     .0000

Model
          coeff       se         t         p       LLCI      ULCI
constant   2.4527     .4849    5.0585     .0000    1.4968    3.4087
C           .4400     .1118    3.9345     .0001     .2195     .6605
Edu        -.4704     .1402   -3.3550     .0009    -.7468    -.1940
Int_1       .0982     .0333    2.9452     .0036     .0325     .1639

Product terms key:
 Int_1:      C      x      Edu

Test(s) of highest order unconditional interaction(s):
     R2-chng         F       df1       df2         p
X*W     .0158    8.6744    1.0000   206.0000     .0036
----------
   Focal predict: C     (X)
      Mod var: Edu    (W)

Conditional effects of the focal predictor at values of the moderator(s):

     Edu    Effect       se         t         p       LLCI      ULCI
  1.0000     .5382     .0821    6.5569     .0000     .3764     .7000
  2.0000     .6364     .0565   11.2665     .0000     .5250     .7477
  4.0000     .8327     .0526   15.8364     .0000     .7290     .9364
************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
 95.0000
W values in conditional tables are the 16th, 50th, and 84th percentiles.

------ END MATRIX -----
```

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.5.3 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3
**************************************************************************
Model: 4
    Y: A (Family planning counseling services)
    X: C (Female's decision-making regarding family planning)
    M: B (Knowledge about family planning)
Sample
Size: 210
**************************************************************************
OUTCOME VARIABLE:
 B
Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .8781     .7710     .3257   700.4633    1.0000  208.0000     .0000
Model
          coeff       se         t         p       LLCI      ULCI
constant   .7728     .1319    5.8612    .0000     .5129    1.0328
C          .8372     .0316   26.4663    .0000     .7749     .8996
**************************************************************************
OUTCOME VARIABLE:
 A
Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .8079     .6527     .5272   194.4794    2.0000  207.0000     .0000
Model
          coeff       se         t         p       LLCI      ULCI
constant   .5460     .1811    3.0153    .0029     .1890     .9030
C          .3591     .0841    4.2695    .0000     .1933     .5250
B          .4820     .0882    5.4641    .0000     .3081     .6560
****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************
Direct effect of X on Y
    Effect       se         t         p       LLCI      ULCI
    .3591     .0841    4.2695    .0000     .1933     .5250

Indirect effect(s) of X on Y:
     Effect    BootSE  BootLLCI  BootULCI
B     .4036     .0876     .2390     .5788

************************ ANALYSIS NOTES AND ERRORS ************************
Level of confidence for all confidence intervals in output:
 95.0000
Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000
------ END MATRIX -----
```

4.4. Summary of Accepted / Rejected Hypothesis:

Hypothesis	Statements	Results
H1	Family planning counseling is positively related with female's decision-making regarding family planning	*Accepted*
H2	Knowledge about family planning mediates the relationship of family planning counseling with female's decision-making regarding family planning	*Accepted*
H3	Level of education moderates the relationship of family planning counseling with Knowledge about family planning such that this relationship was strong when education is high	*Accepted*

Discussion

The Tehsil Sohawa in Punjab, Pakistan, is the setting for this investigation, and we're looking for elements that influence family planning methods. Despite the lack of research in the region, Pakistan hosts a slew of studies [37-39]. Identifying the core issues is essential if we are to effectively address them. In our survey, 57.1 percent of respondents said they have used family planning methods. Those ages 16 to 60 were asked questions. Only a few studies had included male participants prior to mine, despite the fact that most studies had been finished. To a large extent, studies were conducted solely on the basis of data collected from men. A person's location is one of the most important factors in family planning [16]. As emerging countries become more urbanised, contraceptive use is on the rise [40]. Rural residents in Cameroon have been shown to have fewer opportunities than urban residents to be informed about contemporary contraception [41]. I found that urbanization has an effect on people's decisions on family planning, as I uncovered during my investigation. I found that urbanization has an effect on people's decisions on family planning, as I uncovered during my investigation. Women made 47.6 percent of the family planning decisions in urban areas, but only 45.7 percent of the decisions in rural areas were made by women, according to the research. My study found that there was no significant variation in family planning decision-making based on geographic location.

Hypothesis 1:
According to research, extended families are more likely than nuclear families to utilise contraception [26]. Due to a lack of communication between husband and wife, the use of family planning in blended households was much reduced According to these findings, husband-and-wife communication is critical when it comes to family planning decisions. Communication between the husband and wife is essential for discussing family planning and making better decisions about the size of their family. Families with fewer children and fewer members had better communication and made more decisions as a unit [42]. According to my research, increased communication between husband and wife can have a good impact on family planning decisions in Bangladeshi couples. Improved husband-wife communication led to a smaller family and better family planning decisions, they concluded [43].

Hypothesis 2:
In my research, I came across a number of factors that have a significant impact on the ability of couples to plan their families. Fear of unfavorable consequences was a major factor in my respondents' decision to utilize family planning. The majority of responders stated that the usage of injectable contraceptives produces obesity and swelling of the body, which is why they stopped using it. For others, the adverse impact of birth control pills was the induction of "stomach problems, including acid reflux and heartburn." These treatments, which have been shown to have numerous side effects, are the least frequently employed and most rarely favored by women [15,44]. Family planning was well-known to 88.6 percent of our participants. 76.3 percent of those polled were aware of birth control and the various methods available, according to our data. There is a high degree of familiarity with family planning among Pakistanis, according to PDHS surveys conducted in 2006 and 2007. 96% of married women between the ages of 15 and 49 were able to do at least two current operations, according to a study. Punjab, Pakistan's Tehsil Sohawa was the source of our study participants' data. Our study also found that 25.8 percent of respondents had difficulty with religious-cultural issues. It was revealed that religious and cultural variables were a substantial obstacle to family planning in a Pakistani study [45]. According to our data, women who have ever used or are now using contraception fall into two distinct categories. Contraception is still being used at the same rate it has been over the past several decades (57.1 percent). Only 47.7 percent of women had ever used any kind of contraception, while the current user rate of any form of contraception was reported to be 48.7 percent.

Hypothesis 3:
Both the decision makers and the respondents were swayed by the respondents' geographic location and educational attainment [46,47]. 90% of educated women make decisions about family planning, compared to only 8% of less educated women, according to our research. In urban areas, 52.4 percent of decision-makers are men, compared to 54.3 percent in rural areas, which is a significant increase. People living in urban areas are more likely to use family planning services than those living in rural areas because they have better access to them. In Bahawalpur, researchers found the same thing. As a result, they found that city people have easy access to contraception and healthcare providers in the event of a contraception-related issue [48], [49].

Conclusion

According to the study, 23.3% of females and 32.8 % of those who are neither wife nor husband make the decision to have children. The study's findings indicated that poor knowledge, family structure, lower level of education, and people's perceptions that family planning side effects all these factors played a role in people's decisions about family planning.

Practical Implications:
The present study has several practical consequences for organizations, including how to improve performance, efficiency, and compassion, as well as serve utilitarian tasks.
• First and foremost, broaden the experiences of family planning and reproductive health clinics' quality improvement initiatives. The goal is to improve healthcare teams' ability to apply suitable quality assurance tools and processes. This demands the creation of a core group of quality improvement specialists whose duty it is to help and guide teams ready to start development programs. Secondly, empower departments and clinics to start training programs, with a focus on creating reward measures such as certification and accreditation.
• Quality assessment strategy by evaluating healthcare professionals' performance and developing and implementing evidence-based protocols for the full range of reproductive and family planning services.
• Encourage patients and medical providers to interact and communicate. Taking a client-centered approach can help with this.
• Encourage the integration of preventive care by concentrating interventions on client needs rather than primary care.
• Encourage and implement future studies on the economic analysis of reproductive health interventions, which will increase health professionals' awareness of the help people use reproductive health services and reduce the cost of treatments more efficiently.
• The research sheds light on local circumstances surrounding, understanding, opinions, and behaviors around family planning, as well as the significance of education. There will be an increase in the number of women and couples seeking family planning services as attitudes regarding family planning and desired family size change.
• The survey also found a female healthcare practitioner who are competent and trained are especially needed for long-term family planning solutions, as well as well-established health facilities rather are needed for the success of family planning program.
• Interventions in family planning and birth spacing should be focused on reducing men and women's anxieties about side effects by effective counseling and providing enough information about technique side effects and how to handle them.
• Lastly this study highlights the importance of community services, and level of education. Further, how health workers can all play a role in promoting awareness about sociocultural and health issues.

Limitations:
Every research has certain limitations and may benefit from further information in other areas. The current study contains numerous flaws that will need to be addressed by other researchers in the future.
• Firstly, the data obtained from both urban and rural areas to strengthen current study. However, the current study seems not to be generalized due to limited sample and specific population.
• Secondly, the information was gathered directly from married women of specific geographic location i.e; Tehsil Sohawa, Punjab.
• The current study focuses solely on self-report feedback with very limited number of questions on focused areas.
• Finally, the study's subject was extremely delicate and data was gathered in a short amount of time, with few resources, and on a tight budget.

Future Directions:
• Future researchers are required to collect data with an increase in sample size.
• There is a direct need to arrange for health education program sessions for all married couples about contraception and improve counseling services on how it will benefit their socioeconomic and family health.
• The main focus should be given to the importance of family planning and how it helps in preventing social burden and their health.
• More studies should be carried out on the Tehsil level as very few studies had been done earlier to educate communities related to family planning.
• The quality of family planning counseling services needs to be improved so that the rumors and misconceptions can be minimized and it is further needed to educate women about the factor, which were one of the main factors affecting family planning implementation.

References

1. Akers, A. Y., Schwarz, E. B., Borrero, S., & Corbie-Smith, G. (2010). Family discussions about contraception and family planning: a qualitative exploration of black parent and adolescent perspectives. Perspectives on Sexual and Reproductive Health, 42(3), 160-167.
2. Alyahya, M. S., Hijazi, H. H., Alshraideh, H. A., Al-Sheyab, N. A., Alomari, D., Malkawi, S., & Khader, Y. S. (2019). Do modern family planning methods impact women's quality of life? Jordanian women's perspective. Health and Quality of Life Outcomes, 17(1), 1-16.
3. Rana, M. J., & Goli, S. (2017). Family planning and its association with nutritional status of women: investigation in select South Asian countries. Indian Journal of Human Development, 11(1), 56-75.
4. Nyemba-Mudenda, M., & Chigona, W. (2018). mHealth outcomes for pregnant mothers in Malawi: a capability perspective. Information Technology for Development, 24(2), 245-278.
5. Cleland, J., Bernstein, S., Ezeh, A., Faundes, A., Glasier, A., & Innis, J. (2006). Family planning: the unfinished agenda. The Lancet, 368(9549), 1810-1827.
6. Seltzer, J. R. (2002). The origins and evolution of family planning programs in developing countries. Rand Corporation.
7. Singh, S., Darroch, J. E., Ashford, L. S., & Vlassoff, M. (2009). Adding It Up: The costs and Benefits of Investing in family Planning and maternal and new born health. Guttmacher Institute.
8. Desgrées-du-Loû, A., Msellati, P., Viho, I., Yao, A., Yapi, D., Kassi, P., & Dabis, F. (2002). Contraceptive use, protected sexual intercourse and incidence of pregnancies among African HIV-infected women. DITRAME ANRS 049 Project, Abidjan 19952000. International Journal of STD & AIDS, 13(7), 462-468.
9. Becker, D., Koenig, M. A., Mi Kim, Y., Cardona, K., & Sonenstein, F. L. (2007). The quality of family planning services in the United States: findings from a literature review. Perspectives on Sexual and Reproductive Health, 39(4), 206-215.
10. Nyemba-Mudenda, M., & Chigona, W. (2018). mHealth outcomes for pregnant mothers in Malawi: a capability perspective. Information Technology for Development, 24(2),245-278.
11. Geleto, A., Chojenta, C., Musa, A., & Loxton, D. (2018). Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa: a systematic review of literature. Systematic Reviews, 7(1), 1-14.
12. Kim, Y. M., & Lettenmaier, C. (1995). Tools to Assess Family Planning Counseling: Observation and Interview.
13. Teshome, A., Birara, M., & Rominski, S. D. (2017). Quality of family planning counseling among women attending prenatal care at a hospital in Addis Ababa, Ethiopia. International Journal of Gynecology & Obstetrics, 137(2), 174-179.
14. Malhotra, A., Schuler, S. R., & Boender, C. (2002). Measuring women's empowerment as a variable in international development. In background paper prepared for the World Bank Workshop on Poverty and Gender: New Perspectives (Vol. 28).
15. Bruno, L. O., Simoes, R. S., de Jesus Simoes, M., Girão, M. J. B. C., & Grundmann, O. (2018). Pregnancy and herbal medicines: an unnecessary risk for women's health—a narrative review. Phytotherapy Research, 32(5), 796-810.
16. Banke-Thomas, O. E., Banke-Thomas, A. O., & Ameh, C. A. (2017). Factors influencing utilization of maternal health services by adolescent mothers in Low-and middle income countries: a systematic review. BMC Pregnancy and Childbirth, 17(1), 1-14.
17. Al Riyami, A., Afifi, M., & Mabry, R. M. (2004). Women's autonomy, education and employment in Oman and their influence on contraceptive use. Reproductive Health Matters, 12(23), 144-154.
18. Dehingia, N., Dixit, A., Averbach, S., Choudhry, V., Dey, A., Chandurkar, D., & Raj, A. (2019). Family planning counseling and its associations with modern contraceptiveuse, initiation, and continuation in rural Uttar Pradesh, India. Reproductive Health, 16(1), 1-11.
19. Patterson, J. M. (2002). Integrating family resilience and family stress theory. Journal of Marriage and Family, 64(2), 349-360.
20. Kassa, M., Abajobir, A. A., & Gedefaw, M. (2014). Level of male involvement and associated factors in family planning services utilization among married men in Debremarkos town, Northwest Ethiopia. BMC international health and human rights, 14(1), 1-8.
21. Gebremedhin, A. Y., Kebede, Y., Gelagay, A. A., & Habitu, Y. A. (2018). Family planning use and its associated factors among women in the extended postpartum period in Addis Ababa, Ethiopia. Contraception and Reproductive Medicine, 3(1), 1-8.
22. Kohan, S., Simbar, M., & Taleghani, F. (2012). Empowerment in family planning as viewed by Iranian women: A qualitative study. Journal Of Biosocial Science, 44(2), 209-219.
23. Islam, M. A., & Nielsen, C. C. (1993). Maternal and child health services: evaluating mothers' perceptions and participation. Public Health, 107(4), 243-249.
24. Özçelik, E. A., Rohr, J., Hackett, K., Shah, I., & Canning, D. (2020). Applying Inverse Probability Weighting to Measure Contraceptive Prevalence Using Data from a Community-Based Reproductive Health Intervention in Pakistan. International Perspectives on Sexual and Reproductive Health, 46, 21-33.
25. Badar, S., Manzoor, S. & Chaudhary, A. J. (2007) Women empowerment and fertility behavior. The Professional Medical Journal 14(2), 295–299.
26. Kaye, D. K., Mirembe, F. M., Bantebya, G., Johansson, A., & Ekstrom, A. M. (2006). Domestic violence as risk factor for unwanted pregnancy and induced abortion inMulago Hospital, Kampala, Uganda. Tropical Medicine & International Health, 11(1), 90-101.
27. Alemayehu, M., Lemma, H., Abrha, K., Adama, Y., Fisseha, G., Yebyo, H., & Medhanyie, A. A. (2016). Family planning use and associated factors among pastoralist community of afar region, eastern Ethiopia. BMC Women's Health, 16(1), 1-9.
28. Yalew, S. A., Zeleke, B. M., & Teferra, A. S. (2015). Demand for long-acting contraceptive methods and

associated factors among family planning service users, Northwest Ethiopia: a health facility based cross sectional study. BMC Research Notes, 8(1), 1-10.
29. Haile, A., & Fantahun, M. (2012). Demand for long acting and permanent contraceptive methods and associated factors among family planning service users, Batu town, Central Ethiopia. Ethiopian Medical Journal, 50(1), 31-42.
30. Belay, A. D., Mengesha, Z. B., Woldegebriel, M. K., & Gelaw, Y. A. (2016). Married women's decision-making power on family planning use and associated factors in Mizan-Aman, South Ethiopia: a cross sectional study. BMC Women's Health, 16(1), 1-6.
31. De la Vara-Salazar, E., Suárez-López, L., Rivera, L., & Lazcano-Ponce, E. (2018). Providersperspective and geographic and institutional factors associated withfamily planning counseling. Sexual & Reproductive Healthcare, 16, 33-38.
32. Rashid, S., Sohail, S., & Munim, T. F. (2017). Family planning methods; knowledge, perceptions, and ever use of modern family planning methods among childbearing women in Tertiary Care Hospital. Professional Medical Journal, 24(8).
33. Truong, S., Villar de Onis, J., Lindley, A., Bazúa, R., Reyes, A., Montaño, M., & Molina, R.L. (2020). Gender-informed family planning perceptions and decision-making inrural Chiapas, Mexico: a mixed-methods study. International Journal of Reproductive Medicine, 2020.
34. Filiatrault, P., & Ritchie, J. B. (1980). Joint purchasing decisions: A comparison of influence structure in family and couple decision-making units. Journal of Consumer Research, 7(2), 131-140.
35. Radulovic, O., Sagric, C., Tasic, A., Markovic, R., & Bogdanovic, M. (2006). Family planning in women of different age. Age, 15(19), 20-35.
36. Witt, J., McEvers, K., & Kelly, P. J. (2013). Knowledge and experiences of low-income patients with natural family planning. The Journal for Nurse Practitioners, 9(2), 99-104.
37. Stephenson, R., & Hennink, M. (2004). Barriers to family planning service use among the urban poor in Pakistan. Asia-Pacific Population Journal, 19(2), 5-26.
38. Hardee, K., & Leahy, E. (2008). Population, fertility and family planning in Pakistan: a program in stagnation. Population Action International, 3(3), 1-12.
39. Mahmood, N., & Ringheim, K. (1997). Knowledge, approval and communication about family planning as correlates of desired fertility among spouses in Pakistan. International Family Planning Perspectives, 122-145.
40. Paul, P., & Mondal, D. (2021). Association Between Intimate Partner Violence and Contraceptive Use in India: Exploring the Moderating Role of Husband's Controlling Behaviors. Journal of interpersonal violence, 08862605211015212
41. Assouni Mindjah, Y. A., Essiben, F., Foumane, P., Dohbit, J. S., & Mboudou, E. T. (2018). Risk factors for ectopic pregnancy in a population of Cameroonian women: A case control study. Plos One, 13(12), e0207699.
42. Withers, M., Dworkin, S. L., Zakaras, J. M., Onono, M., Oyier, B., Cohen, C. R., & Newmann, S. J. (2015). 'Women now wear trousers': men's perceptions of family planning in the context of changing gender relations in western Kenya. Culture, Health & Sexuality, 17(9), 1132-1146.
43. Uddin, J., Hossin, M. Z., & Pulok, M. H. (2017). Couple's concordance and discordance in household decision-making and married women's use of modern contraceptives in Bangladesh. BMC Women's Health, 17(1), 1-10.
44. Kadir, M. M., Fikree, F. F., Khan, A., & Sajan, F. (2003). do mothers-in-law matter? family dynamics and fertility decision-making in urban squatter settlements of karachi, pakistan; MM Kadir et al.; Family dynamics and fertility decision making in Pakistan. Journal of Biosocial Science, 35(4), 545.
45. Ataullahjan, A., Mumtaz, Z., & Vallianatos, H. (2019). Family planning, Islam and sin: Understandings of moral actions in Khyber Pakhtunkhwa, Pakistan. Social Science & Medicine, 230, 49-56.
46. Sen, C. K. (2019). Human wounds and its burden: an updated compendium of estimates. World Health Organization Maximizing Positive Synergies Collaborative Group. (2009). An assessment of interactions between global health initiatives and country healthsystems. The Lancet, 373(9681), 2137-2169.
47. Selkirk, C. G., Veach, P. M., Lian, F., Schimmenti, L., & LeRoy, B. S. (2009). Parents' perceptions of autism spectrum disorder etiology and recurrence risk and effects of their perceptions on family planning: Recommendations for genetic counselors. Journal of Genetic Counseling, 18(5), 507-519.
48. Hassan, S., Arif, M. A., Abbas, S. F., & Azmat, U. (2020). Influence of Mother-in-law on Family Size. Journal of Sheikh Zayed Medical College (JSZMC), 11(03), 17-20.

The Attitude of Health Care Providers in Saudi Arabia to Covid-19 Vaccine and Implementing Preventive Measures

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Abstract

Aim: This study would be the first of its kind in the Kingdom of Saudi Arabia, mainly to evaluate the willingness of the community to be vaccinated against the COVID-19 virus, assess attitudes towards continuing to use protective measures after getting vaccinated, and to continue to monitor changes in the spread of the COVID 19 virus after implementation of vaccination.

Method: This is a cross-sectional study, questionnaire-based survey. The study includes 302 participants from Makkah region of Saudi Arabia. Statistical analysis was performed using descriptive statistical analysis.

Result: Out of 302 participants in the research the age 21-30 was 44.4%. 61.6% of the respondents took the vaccine, and 95.4% of them want to keep using the protective measures after receiving the vaccine.

Conclusion: Healthcare providers and co-workers are willing to receive the COVID-19 vaccine. Still, we strongly recommend that healthcare providers need more preparation and an evidence-based approach to address the safety and efficacy of the vaccines in the community and build and maintain public trust in the vaccine.

Keywords: Health care providers, COVID-19, Vaccination, Protective measures.

Background

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or coronavirus disease 2019 (COVID-19) has spread internationally since December 2019, becoming a massive pandemic and world crisis. The first case of COVID-19 in Saudi Arabia was detected in Qatif in an individual who had traveled to the endemic region of Iran (1). Due to the fast-spreading nature of the COVID-19 pandemic, the world continues to observe measures to prevent further spread by various means, such as social distancing, wearing masks and face shields, preventing crowding, and working from home when possible. Introduction and implementation of COVID-19 vaccination is relatively new and has only been available to a very small portion of the world population so far. We are performing a qualitative study using primary data to get insight into how the attitude towards implementing preventive measures varies among people who have received the vaccination.

The COVID-19 vaccine, an mRNA vaccine produced by Pfizer, was first made available in December 2020. Both the Pfizer and Moderna vaccines are lipid nanoparticle coated mRNA vaccines that code for the coronavirus spike protein. This mRNA is processed by the recipient's ribosomes to produce the spike protein which subsequently induces an immune response that renders the recipient immune to the virus. Recently, the AstraZeneca vaccine, a modified adenovirus DNA vaccine, has been approved in Saudi Arabia. Currently not enough data exists to inform us about the behavioral change towards preventive measures among individuals who have received the vaccination. However, such information is crucial to predict the response of the remaining vast majority of people as they continue to vaccinate. The responses will impact how people view the pandemic-related lockdowns, travel restrictions, social gatherings ban, fear of getting diseases, and therefore overall the global economy. It may also provide a sense of security that can prove harmful towards individuals who are not vaccinated yet. The fact that the first set of vaccines was provided majorly to health care workers across the world can skew the data towards behavior of one type of population group and may not reflect the behavior of the common population.

Literature Review

Public perception towards vaccination has a direct effect upon vaccine uptake and therefore pandemic recovery. Many people have negative views regarding the COVID-19 vaccine, and such ideas have been spread through social media since the beginning of this pandemic. The medical and economic implications of a negative public perception towards vaccination can only be understood after studying and quantifying the prevalence of such perceptions. Since the beginning of this pandemic, many studies have been conducted in various countries that shed light on local public perceptions and predict future vaccination uptake.

A cross sectional survey conducted in April 2020 in the United States asked participants "When a vaccine for the coronavirus becomes available, will you get vaccinated?". The authors reported that 3 in 10 adults weren't sure if they would accept the vaccine, while 1 in 10 didn't intend to get vaccinated (2). Another U.S. study reported that 67% of respondents would accept a COVID-19 vaccine (3). A study in the UK reported that 14% of respondents were unwilling to take the vaccine, while 23% weren't sure (4). Another study done in the UK and Ireland reported that vaccine hesitancy/resistance rate was 31% and 35% for these populations respectively (5). Similar numbers were reported in other European studies. Most of these studies also investigated the determinants of vaccine hesitancy and resistance. Income, race, political affiliation, educational level, and geographic location were all contributing factors, but the most consistently reported determinant is previous influenza vaccination. The rates of vaccine acceptance vary from country to country however. A Chinese study reported that parental acceptance of COVID-19 vaccination for their child was 72.6% (6). In contrast, an alarming Jordanian study reported that only 37.4% of participants would accept a COVID-19 vaccine (7). If such rates were to be translated into vaccine uptake, herd immunity for this virus would not be achievable. As such disparities in vaccine acceptance exist between countries, it is therefore imperative that the attitudes towards COVID-19 vaccination and the determinants of vaccine resistance be investigated in every population group.

Rationale:
The challenges are made worse by the unpredictable increase of the epidemics. In this research we are keen to study the attitude of the targeted health care provider and behavior toward this serious condition especially with the huge influence of the social media globally on the decision-making.

Aim:
This study would be the first of its kind in the Kingdom of Saudi Arabia, mainly to evaluate the willingness of the community to be vaccinated against the COVID-19 virus, assess attitudes towards continuing to use protective measures after getting vaccinated, and continue to monitor changes in the spread of the COVID 19 virus after implementation of vaccination.

Objectives:
To provide essential attitude of the health care provider in Saudi Arabia toward a covid-19 vaccine and to identify factors predictive of a range of negative attitudes towards vaccines, and uncertainty and lack of intent to vaccinate against COVID-19, as well as to evaluate the impact of various socio-economic factors that cause this reaction against the covid-19 vaccine. Finally, to understand the basic knowledge of the population of the possibility of getting or/and transmitting the infection after vaccination.

Methodology

Study Design: This is a cross-sectional study among health care providers in Saudi citizens and residents.

Study Population: Health care providers in the Saudi health care facilities

Eligibility Criteria: Exclusive criteria under age of 16

Study Area: Makkah Region

Sample Size: 302

Sample Technique: Simple random

Data Collection: Data was collected in March 2021. A structured questionnaire was developed to cover the research objectives. Validity was reviewed by selected healthcare experts and professionals and tested on a sample of the target population.

Variables: The dependent variable in this study was using the protective measures against covid-19 and the willingness to be vaccinated against the virus. The predisposing variables are age, sex, marital status, nationality, residency, education level, past history of medical disease, history of vaccination against covid-19, type of protective measures used.

Socio-demographic variables:
- **Age** of the participants at the time of the interview was recorded in complete years and identified as under 16, 16-20, 21-30, 31-40, 41-50, 51-60, and above 60.
- **Sex** was defined as Male or Female
- **Marital Status** was defined as: married, divorced or widowed.
- **Nationality** was defined as: Saudi, Non-Saudi.
- **Education** was defined as a completed level: primary education, diploma, graduate, post graduate.
- **Occupation** was defined as: Nurse, Physician, and Administrative, other.
- **Past History of Medical Disease** was defined as: Hypertension, Diabetes, Allergy, Asthma, other, and None.
- **History of vaccination** against covid-19 defined as: vaccinated, not vaccinated.
- **Type of Protective Measures Used** defined as: wearing mask, washing hands or wearing gloves, keep social distance, and Limit social gatherings and time spent in crowded places.
- **The Possibility of Transmitting the COVID-19** defined as: Yes/No.

Data analysis: In the present study, statistical analysis using "IBM SPSS statistics ver. 20.0" was applied to evaluate and test the hypothesis. The level $P<0.05$ was used as the cut-off value for significance.

Results

Three hundred and two respondents were included in the study from health care facilities in the Makkah region; most of them were between the age of 21-30 years old with 44.4%, there were no mean gender differences, 66.2% were single, 86.1% were Saudi, 52% of them had a bachelor degree. In addition to that 4.3% were nurses, 38.4% were physicians, 10.9% were administration, and 46.4% were others. Furthermore, of most of the respondents, 73.5% have no chronic disease (Table 1). Besides that, 61.6% of them were vaccinated at the time of the data collection, while 38.4% were not. Additionally, 95.4% of the respondents were willing to use the protective measures even after receiving the vaccine (Table 2). Most of the protective measures were wearing masks 91.7%, washing hands 85.8%, keeping social distance 80.5%, limiting social gathering 71.5%, and the least recorded was wearing gloves with 31.1% (Figure 1). Most importantly, of the respondents, 82.4% were using at least three protective measures (Table 3). Moreover, 89.1% of the respondents believe vaccines are ineffective, and 70.5% are still afraid of getting the COVID-19 infection.

To identify factors predictive of a range of negative attitudes towards vaccines and lack of intent to vaccinate against COVID-19; a relationship was made between those who didn't receive the vaccine versus the causes of the implementing protective measures after receiving the vaccine which shows a significant association [P-value =.16] for those who think the vaccine is not effective and [P-value<0.001] as they feel safer to keep using the protective measures (Table 5).

To evaluate the impact of various socio-economic factors that cause this reaction against the covid-19 vaccine, a relationship between those who receive the vaccine versus socio-economic variables shows a significant association with age, marital status, education, and occupation (Table 6).

Finally, 70.5% of all respondents think that they are prone to transmit COVID-19 infection after receiving the vaccine (Table 7).

		Frequency	Percent	Valid Percent	Cumulative Percent
Age	1 to under 16	33	10.9	10.9	10.9
	16-20	52	17.2	17.2	28.1
	21-30	134	44.4	44.4	72.5
	31-40	54	17.9	17.9	90.4
	41-50	19	6.3	6.3	96.7
	above 50	10	3.3	3.3	100.0
	Total	302	100.0	100.0	
Gender	male	145	48.0	48.0	48.0
	females	157	52.0	52.0	100.0
	Total	302	100.0	100.0	
Marital Status	Single	200	66.2	66.2	66.2
	Married	90	29.8	29.8	96.0
	Divorced or Widower	12	4.0	4.0	100.0
	Total	302	100.0	100.0	
Nationality	Saudi	260	86.1	86.1	86.1
	Non-Saudi	42	13.9	13.9	100.0
	Total	302	100.0	100.0	
Education	Less than high school	46	15.2	15.2	15.2
	High School Diploma	47	15.6	15.6	30.8
	College Diploma	13	4.3	4.3	35.1
	Bachelor	157	52.0	52.0	87.1
	Masters/ PhD	39	12.9	12.9	100.0
	Total	302	100.0	100.0	
Occupation	Nurse	13	4.3	4.3	4.3
	Physician	116	38.4	38.4	42.7
	Administrative	33	10.9	10.9	53.6
	Other	140	46.4	46.4	100.0
	Total	302	100.0	100.0	
History of Chronic Disease	None	222	73.5	73.5	73.5
	Allergy	28	9.3	9.3	82.8
	Asthma	24	7.9	7.9	90.7
	Diabetes	9	3.0	3.0	93.7
	Hypertension	12	4.0	4.0	97.7
	other	7	2.3	2.3	100.0
	Total	302	100.0	100.0	

Table (1): Socio-economic Variables.

		Frequency	Percent	Valid Percent	Cumulative Percent
Vaccination profile	no	116	38.4	38.4	38.4
	yes	186	61.6	61.6	100.0
	Total	302	100.0	100.0	

Table (2): Vaccination-Profile

		Frequency	Percent	Valid Percent	Cumulative Percent
Protective measure application after vaccination	No	14	4.6	4.6	4.6
	yes	288	95.4	95.4	100.0
	Total	302	100.0	100.0	
How many protective measures you are using/	0	4	1.3	1.3	1.3
	1	26	8.6	8.6	9.9
	2	23	7.6	7.6	17.5
	3	53	17.5	17.5	35.1
	4	122	40.4	40.4	75.5
	5	74	24.5	24.5	100.0
	Total	302	100.0	100.0	

Table (3): willing to use the protective measures after receiving the vaccine

Why do you think implementing of this measure after receiving the vaccine is important?	no		yes	
	Count	Table N %	Count	Table N %
I think vaccine is not effective.	269	89.1%	33	10.9%
I think it is safer to keep using it	99	32.8%	203	67.2%
Because it is the government instruction.	172	57.0%	130	43.0%
I'm still afraid of the COVID19.	213	70.5%	89	29.5%

Table (4): the importance of implementing the protective measures.

Why do you think implementing of this measure after receiving the vaccine is important?	Did you receive the COVID-19 vaccine?	P-Value
	no	
I think vaccine is not effective.	19	=0.16
	57.6%	
I think it is safer to keep using it	29.1%	<0.001
	116	
Because it is the government instruction.	39.2%	> 0.05
	116	
I'm still afraid of the COVID19.	38.2%	> 0.05
	116	

Table (5): didn't receive the vaccine versus the causes of the implementing the protective measures after receiving the vaccine

Table (6): Socio-economic Variables Vs who received the vaccine

		Did you receive the COVID-19 vaccine?		Total	P-Value
		no	yes		
Age	under 16	26	7	33	<0.001
		22.4%	3.8%		
	16-20	41	11	52	
		35.3%	5.9%		
	21-30	29	105	134	
		25.0%	56.5%		
	31-40	12	42	54	
		10.3%	22.6%		
	41-50	5	14	19	
		4.3%	7.5%		
	above 50	3	7	10	
		2.6%	3.8%		
Gender	Male	53	92	145	>0.05
		45.7%	49.5%		
	Female	63	94	157	
		54.3%	50.5%		
Marital Status	single	100	100	200	<0.001
		86.2%	53.8%		
	married	13	77	90	
		11.2%	41.4%		
	Divorced or Widower	3	9	12	
		2.6%	4.8%		
Nationality	Saudi	97	163	260	>0.05
		83.6%	87.6%		
	Non-Saudi	19	23	42	
		16.4%	12.4%		
Education	Less than high school	43	3	46	<0.001
		37.1%	1.6%		
	High School Diploma	30	17	47	
		25.9%	9.1%		
	College Diploma	4	9	13	
		3.4%	4.8%		
	Bachelor	33	124	157	
		28.4%	66.7%		
	Masters/ PhD	6	33	39	
		5.2%	17.7%		

(continued next page)

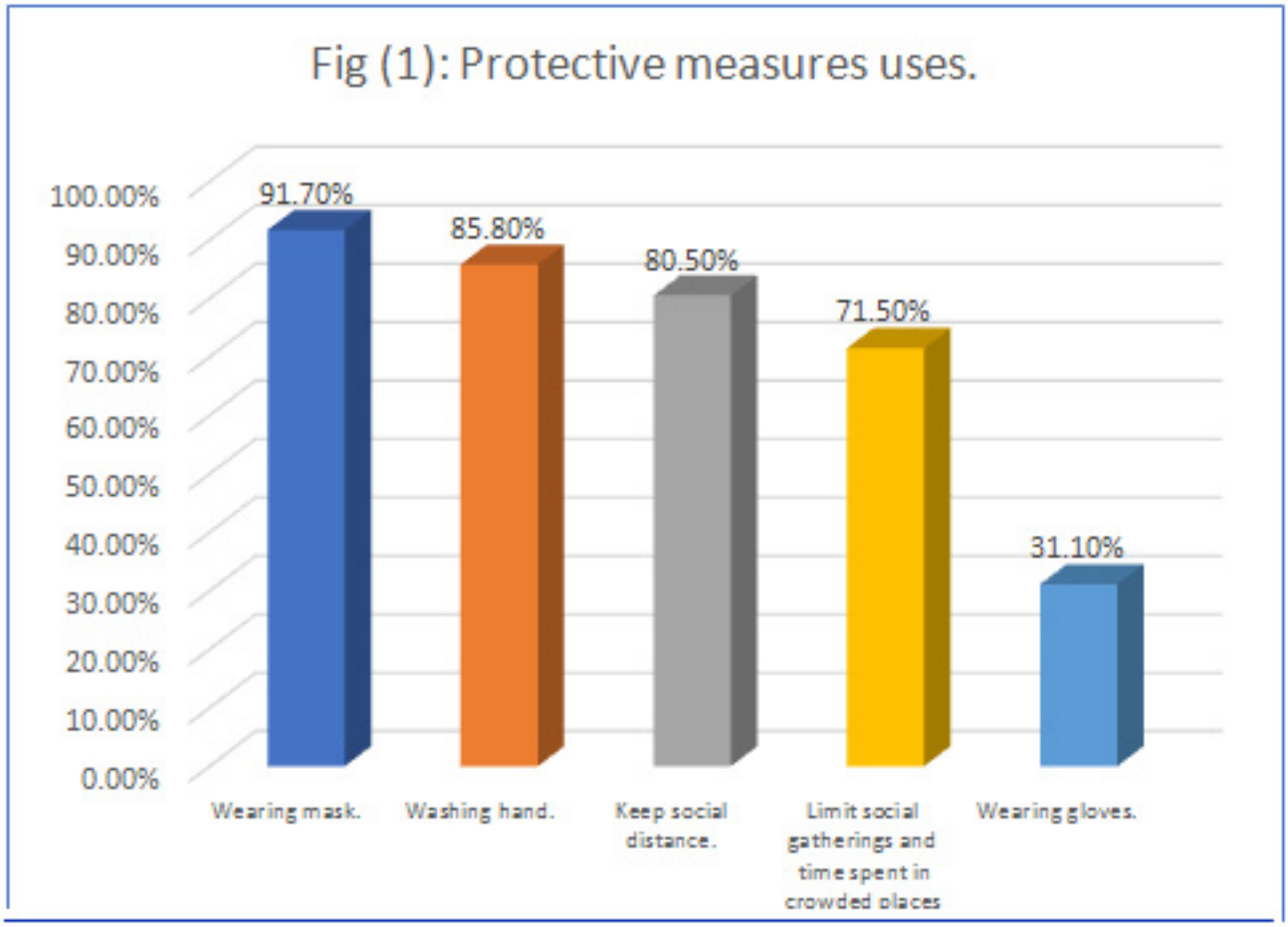
Table (6): Socio-economic Variables Vs who received the vaccine continued

Occupation	Nurse	5	8	13	<0.001
		4.3%	4.3%		
	Physician	23	93	116	
		19.8%	50.0%		
	Administrative	7	26	33	
		6.0%	14.0%		
	Other	81	59	140	
		69.8%	31.7%		
History of chronic disease	None	84	138	222	
		72.4%	74.2%		
	Allergy	13	15	28	
		40.6%	31.2%		
	Asthma	11	13	24	
		34.4%	27.1%		
	Diabetes	2	7	9	
		22.2%	14.6%		
	Hypertension	3	9	12	
		6.2%	18.8%	100.0%	
	Other	3	4	7	
		9.4%	2.2%	100.0%	

Table (6): Socio-economic Variables Vs who received the vaccine

		Frequency	Percent	Valid Percent	Cumulative Percent
Do you thinkthat you can transmit COVID-19 after vaccination?	no	89	29.5	29.5	29.5
	yes	213	70.5	70.5	100.0

Table (7): transmitting COVID-19 after receive the vaccine.



Discussion

Our cross-sectional study examines healthcare workers' knowledge, attitude, and acceptance of COVID-19 vaccination in the Makkah region in Saudi Arabia. Our results showed that a large number of respondents are accepting to be vaccinated. Nevertheless, the adverse effects of all vaccines are not well elaborated. The lack of confidence about the vaccine causes was why the respondents wanted to use the protective measures despite their vaccination status. This is compatible with another cross-sectional study in the eastern region of Saudi Arabia among 236 participants who showed that the acceptance rate for the COVID-19 vaccine was average among health care providers (8). Vaccine acceptability was higher among several socio-economic factors like age, marital status, education, and occupation.

The rapid evolution of the COVID-19 situation worldwide and in Saudi Arabia makes it challenging for healthcare systems to adapt and hesitant health providers to receive the COVID-19 vaccine. Although developing several COVID-19 vaccines in less than a year, it is unlikely that any vaccines will be effective at stopping the transmission of infection. There is a small risk of breakthrough infection (9). This may explain the hesitancy of respondents against the vaccine and the reason for keeping use of protective measures against it. Moreover, this study shows sufficient knowledge of the possibility of transmitting the COVID-19 vaccine even after vaccination. Still, new studies showed that COVID-19 transmission after full vaccination reduced and decreased the symptoms for those who get the infection (9-11), which made the crucial role of protection against Covid 19 not using protective measures.

Our study shows that COVID-19 vaccine acceptance can be predicted with relatively high accuracy by readily available demographic characteristics. However, we must be cautious, assuming that reported acceptance or intent translates into actual behavior. This is primarily a concern when there is some time between the measurement of intention and the observation of behavior, as some may explicitly reference scientifically inaccurate information. Nevertheless, building confidence in a COVID-19 vaccine is essential to offer protection, improve the immune system, and make the body more capable of resisting the infection.

Coronavirus vaccine, together with measures to stop viruses spreading, like social distancing, are the best way to protect yourself and the community from Covid-19, as they provide strong protection against serious illness, hospitalization, and death (1). It is crucial to encourage the community to take the vaccine of COVID-19 and enhance awareness that the vaccines are an essential tool to stop the pandemic and protect the body.

Conclusion

Healthcare providers and co-workers are willing to receive the COVID-19 vaccine. Still, we strongly recommend that healthcare providers need more preparation and an evidence-based approach to address the safety and efficacy of the vaccines in the community and build and maintain public trust in the vaccine.

Recommendation:
To build up a well-planned media and enhance a positive campaign to share scientific information with the community in terms of epidemiological details of how the vaccine reduces transmission, scientific facts of in whom it erases the symptoms and decreases the chances of hospitalization, and the methodological process of the vaccine to address misinformation that may encourage receiving of the vaccine.

References

1. Al-Khani AM, Khalifa MA, Almazrou A, Saquib N. The SARS-CoV-2 pandemic course in Saudi Arabia: A dynamic epidemiological model. Infect Dis Model. 2020;5:766-771. doi:10.1016/j.idm.2020.09.006
2. Fisher KA, Bloomstone SJ, Walder J, Crawford S, Fouayzi H, Mazor KM. Attitudes Toward a Potential SARS-CoV-2 Vaccine: A Survey of U.S. Adults. Ann Intern Med. 2020;173(12):964-973. doi:10.7326/M20-3569
3. Malik AA, McFadden SM, Elharake J, Omer SB. Determinants of COVID-19 vaccine acceptance in the US. EClinicalMedicine. 2020;26:100495. doi:10.1016/j.eclinm.2020.100495
4. Paul E, Steptoe A, Fancourt D. Attitudes towards vaccines and intention to vaccinate against COVID-19: Implications for public health communications. Lancet Reg Heal - Eur. 2021;1:100012. doi:10.1016/j.lanepe.2020.100012
5. Murphy J, Vallières F, Bentall RP, et al. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. Nat Commun. 2021;12(1):29. doi:10.1038/s41467-020-20226-9
6. Zhang KC, Fang Y, Cao H, et al. Parental Acceptability of COVID-19 Vaccination for Children Under the Age of 18 Years: Cross-Sectional Online Survey. JMIR Pediatr Parent. 2020;3(2):e24827. doi:10.2196/24827
7. Tamam El-Elimat, Mahmoud M. AbuAlSamen, Basima A. Almomani, Nour A. Al-Sawalha FQA. Acceptance and Attitudes Toward COVID-19 Vaccines: A Cross-Sectional Study from Jordan. doi:https://doi.org/10.1101/2020.12.22.20248676
8. World Health Organization. Coronavirus disease (COVID-19) dashboard. Available from: https://covid19.who.int.
9. Eyre, D. W., et al. (2022). “Effect of Covid-19 Vaccination on Transmission of Alpha and Delta Variants.” New England Journal of Medicine 386(8): 744-756.
10. Franco-Paredes, C., 2022. Transmissibility of SARS-CoV-2 among fully vaccinated individuals. The Lancet Infectious Diseases 22, 16. doi:10.1016/s1473-3099(21)00768-4
11. Vitiello, A., Ferrara, F., Troiano, V., La Porta, R., 2021. COVID-19 vaccines and decreased transmission of SARS-CoV-2. Inflammopharmacology 29, 1357–1360.. doi:10.1007/s10787-021-00847-2

What are the current COVID-19 public awareness levels and practices in Saudi Arabia? Analysis of data from an online survey conducted in 2021

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Abstract

Background: The World Health Organization (WHO) designated the coronavirus disease (COVID-19) a pandemic in March 2020. Prevention and control measures were implemented worldwide to limit the spread of the disease, and the effectiveness of these measures depend on the degree of awareness and adherence of the populations. This study was conducted to determine the current awareness levels and health practices of the Saudi Arabian population and to assess how much the education programs had improved the public awareness levels and health practices.

Methods: This cross-sectional study was conducted in Saudi Arabia from November 2020 to May 2021 and enrolled 1062 participants. The current knowledge levels, attitudes, and practices of the Saudi Arabian population were assessed based on an online questionnaire survey.

Results: The mean knowledge score was 29.36 ± 3.80; and 53.7%, 45.2%, and 1.1% of the participants had high, moderate, and low knowledge levels, respectively. The knowledge score was significantly related to the education level ($p<0.001$). The mean attitude score was 10.28 ± 2.56 and 74.9% of the participants had a high attitude level. The mean practice score was 3.67 ± 0.595, with significant differences that were related to the female sex ($p=0.005$) and younger age groups ($p<0.05$) and between those aged 30–34 years and those aged 35–39 or 40 years and older

Conclusion: The participants exhibited a high level of public awareness in all sub-scales of knowledge, practices, and attitudes for the prevention of COVID-19.

The overall knowledge levels, attitudes, and practices of the Saudi Arabian population had considerably improved since the beginning of the pandemic.

Keywords: coronavirus; pandemic; prevention; control measures; practice

Introduction

The coronavirus disease (COVID-19) is a viral respiratory disease that is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and was first identified in Wuhan, China, in late 2019 [1]. COVID-19 spread quickly, inflicting a plague across China that was followed by an expanding number of cases in different countries. In February 2020, the World Health Organization (WHO) designated COVID-19 as a public health outbreak of global concern [2]. Subsequently, the explosive spread of the virus was confirmed in many countries, including in the Middle East [3]. COVID-19 first appeared in Saudi Arabia in March 2020; by June 2020, the health authorities had reported more than 100,000 cases and 283 deaths, mostly in Riyadh, Jeddah, Mecca, and Medina [4]. The infection initially appeared to be zoonotically transmitted, as it was first noticed in individuals who were exposed to wet markets [5]; however, SARS-CoV-2 infection without exposure to the wet market made person-to-person transmission seem most likely [6].

The effectiveness of public health control measures depend on the public awareness of disease transmission and the presentation and commitment to these safety measures [7]. Citizens who complied with protective measures had excellent knowledge during the COVID-19 outbreak in China [8]. The awareness and practices with regard to COVID-19 were extensively studied in Saudi Arabia since the beginning of the pandemic. However, gaps in the knowledge, attitude, and practices persist, and researchers have suggested further studies and more educational programs to improve public awareness. A multinational cross-sectional study with participants from three Middle Eastern countries, including Saudi Arabia, reported low knowledge levels about COVID-19 transmission [9].

In March 2020, participants of a wide public awareness study in Saudi Arabia had high-level public knowledge of SARS-CoV-2 transmission routes and adherence to personal protective measures, but had lower practice scores that were linked to the age and regional variations [10]. In April 2020, Alahdal et al. conducted an analytical study in Riyadh, Saudi Arabia to assess the awareness, attitudes, and practices during the COVID-19 pandemic and reported moderate public awareness, but better attitudes and practices [11]. In May 2020, another community-based study showed satisfactory knowledge, attitudes, and practices towards COVID-19 in Saudi Arabia, despite sub-par knowledge of the transmission route and awareness of disease severity and complications in only a small proportion of the participants [12]. In June 2020, Almofada et al. undertook a population-based cross-sectional study in Saudi Arabia to assess the awareness of disease severity and incubation period as well as the adoption of preventive measures, and concluded that the Saudi population is aware of preventive attitudes and practices as well as the mode of transmission; however, the study did not explore all the subscales of knowledge and practices [13].

Considering the demonstrable increase in the total number of newly diagnosed COVID-19 cases despite the high number of prevention and control measures that have been implemented by the Saudi Arabian government, a gap in the awareness and practice can be inferred. Thus, there was a crucial need to update the knowledge of the current awareness levels and practices to assess the extent to which the efforts to improve awareness and preventive practices among the Saudi population had been successful. Therefore, the aim of this study was to determine the current knowledge, attitude and practice of COVID-19 among Saudi Arabian population and to assess how much the education programs had improved the public awareness levels and health practices.

Materials and Methods

1 Study design

This questionnaire-based cross-sectional survey was conducted among residents of Saudi Arabia from November 2020 to May 2021, to assess the current knowledge, attitudes, and practices among the Saudi population. The Kingdom of Saudi Arabia is located in the southwest region of Asia, with a total area of 2,149,690 km2 and a population of 34,813,871, according to the latest United Nations data in 2020. Saudi Arabia is abutted by Oman and Yemen to the south; Jordan, Kuwait, and Iraq to the north; the United Arab Emirates, the Arabian Gulf, and Qatar to the east; and the Red Sea to the west [14].

All adult citizens and expatriates (age ≥18 years) residing in Saudi Arabia were invited to participate in the study. Given the current situation of the COVID-19 pandemic and the recommended physical distancing measures, the questionnaire was distributed online, through social media (Twitter and Whats App groups), and the survey link was posted on the websites of different universities and colleges. A total of 1092 participants were included in the study, based on the Epi Info formula [15]. The sample size was calculated based on the confidence level (95%), margin of error (3%), a 10% non-response rate, and a total population of 34,813,871.

Given the unavailability of a standard questionnaire, the authors developed a self-reported questionnaire in accordance with the Center for Disease Control and Prevention (CDC) guidelines for the COVID-19 community. The questionnaire was drafted in English and translated into Arabic and back-translated to validate the accuracy of the translation prior to validation in a pilot study with 15 participants. Accordingly, ambiguous words or phrases were modified; for example, “I don’t know” was replaced by a dichotomous yes/no answer. The pilot group’s feedback was incorporated and the final questionnaire was developed.

The first page of the online questionnaire comprised clear information about the study’s background and objectives and clarified information about participation, withdrawal, confidentiality, and informed consent. The questionnaire comprised four primary sections: the first gathered

information on the respondents' sociodemographic characteristics, including age, sex, marital status, education level, work status, and region of residence; the second assessed the participants' knowledge of COVID-19, including modes of transmission, clinical symptoms, treatment, risk groups, isolation, prevention, and control; and the third and fourth sections assessed the participants' attitudes and practices with regard to COVID-19, respectively.

2 Ethics

Ethical approval for this study was obtained from the Institutional Review Board of Jazan University (Reference No.: REC42/1/015). The purpose of the study was explained to the participants. Data privacy and confidentiality were maintained throughout the research.

3 Scoring of the answers

Participants marked knowledge items as either true or false statements, and incorrect and correct responses were scored 0 and 1, respectively, with high scores indicating better knowledge of COVID-19. Cronbach's α was used to evaluate items for internal reliability (indicated by a coefficient of 0.70) [16]. For the attitudes, scores were calculated based on the participants' answers to each attitudinal statement as follows: 1, strongly disagree; 2, disagree; 3, undecided; 4, agree; and 5, strongly agree by obtaining the average of the answers to six statements; high scores indicate positive attitudes. The Likert scales were assessed for internal reliability (Cronbach's α coefficient 0.81). With regard to practices, participants responded "yes" or "no" to the items, and answers that reflected good and bad practices were given a score of 1 and 0, respectively, with high scores indicating better practices.

The survey data were coded, reviewed, and entered into a computerized data base and analysed using Statistical Package for the Social Sciences (SPSS) version 25. Frequencies and percentages (descriptive statistics) were used to analyse the selected sociodemographic variables. The chi-square test was used to determine the significance of the relationship between sociodemographic characteristics and knowledge about COVID-19 and to assess the attitudes and practices towards COVID-19 prevention; $P \leq 0.05$ was considered statistically significant.

List of Abbreviations

WHO	World Health Organization
COVID-19	Coronavirus disease 19
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
CDC	Center for Disease Control and Prevention
MOH	Ministry of Health

Results

Table 1 shows the participants' sociodemographic profile; 697 (63.8%) and 395 (36.2%) of the participants were male and female, respectively; 489 (44.8%), 159 (14.6%), 126 (11.5%), 133 (12.2%), and 185 (16.9%) were <25, 25–29, 30–34, 35–39, and ≥40 years, respectively. The majority of participants (n=1037, 95%) were Saudis and 55 (5%) were non-Saudi. Furthermore, 160 (14.7%), 70 (6.4%), 13 (1.2%), 106 (9.7%), and 743 (68%) participants were from the central, eastern, northern, western, and southern regions, respectively; 281 (25.7%), 468 (42.9%), 245 (22.4%), 95 (8.7%), and 3 (0.3%) were living in an apartment, private house, villa, traditional house, and hotel, respectively. With regard to the level of education, 1 (0.1%), 9 (0.8%), 280 (25.6%), 723 (66.2%), and 79 (7.2%) had a primary school, intermediate school, high school, bachelor, and postgraduate (masters/doctorate), respectively. The commonest occupation listed among the participants was student (n=245, 22.4%), followed by medical student (n=170, 15.6%), educational sector (n=155, 14.2%), and health worker (n=256, 23.4%).

Table 2 presents the participants' responses towards the knowledge assessment questions; 90.20%, 98.90%, and 99.5% of the participants considered that COVID-19 was a respiratory tract infection, that virus transmission occurred by touching contaminated hands, and that the virus spreads in crowded places.

Table 1. Sociodemographic profile of the participants (n=1092)

Demographics	Number (N)	Percentage (%)
Sex		
Male	697	63.8
Female	395	36.2
Age, years		
<25	489	44.8
25–29	159	14.6
30–34	126	11.5
35–40	133	12.2
>40	185	16.9
Nationality		
Saudi	1037	95
Non-Saudi	55	5
Region		
Central	160	14.70
Eastern	70	6.40
Northern	13	1.20
Western	106	9.70
Southern	743	68.00
Level of education		
Primary	10	0.90
Secondary	280	25.60
University	723	66.20
Postgraduate (masters/doctorate)	79	7.20
Occupation		
Health sector	256	23.40
Non-health sector	836	76.60

Table 2. Participants' responses to the knowledge-assessment questions (n=1092)

Questions	Number (N)	Percentage (%)
Q1: COVID-19 affects the respiratory system.		
• Yes	1083	99.20
• No	9	0.80
Q2: The coronavirus is transmitted by touching a hand contaminated with the virus to the nose, mouth, or eyes.		
• Yes	1080	98.90
• No	12	01.10
Q3: A person infected with the virus does not show symptoms until after a period of 14 days.		
• Yes	570	52.20
• No	522	47.80
Q4: The virus can be transmitted from person to person even if the virus is still in the incubation period.		
• Yes	992	90.80
• No	100	9.20
Q5: The virus spreads in crowded and gathering places.		
• Yes	1087	99.50
• No	5	0.50
Q6: The symptoms of COVID-19 are similar to those of seasonal influenza.		
• Yes	977	89.50
• No	115	10.50
Q7: The virus affects all age groups.		
• Yes	1072	98.20
• No	20	1.80
Q8: Every person infected with the coronavirus needs to be hospitalised.		
• Yes	97	8.90
• No	995	91.10
Q9: The disease cure rate is very high.		
• Yes	1014	92.90
• No	78	7.10
Q10: The death rate due to the coronavirus is low.		
• Yes	882	80.90
• No	209	19.10
Q11: Elderly people and those with chronic diseases are more susceptible to being infected by the coronavirus.		
• Yes	1074	98.40
• No	18	1.60
Q12: Is there currently a proven cure?		
• Yes	54	4.90
• No	1038	95.10

Figure 1 depicts the participants' responses on the mode of transmission; the most commonly identified means of transmission were spray from the infected person's sneeze or cough (n=1043, 95.5%), contact with a person infected by SARS-CoV-2 (n=1014, 92.9%), contact with surfaces contaminated with the oronasal secretions of an infected individual (n=951, 87.1%).

Figure 1. Participants' responses about the mode of transmission of SARS-CoV-2.

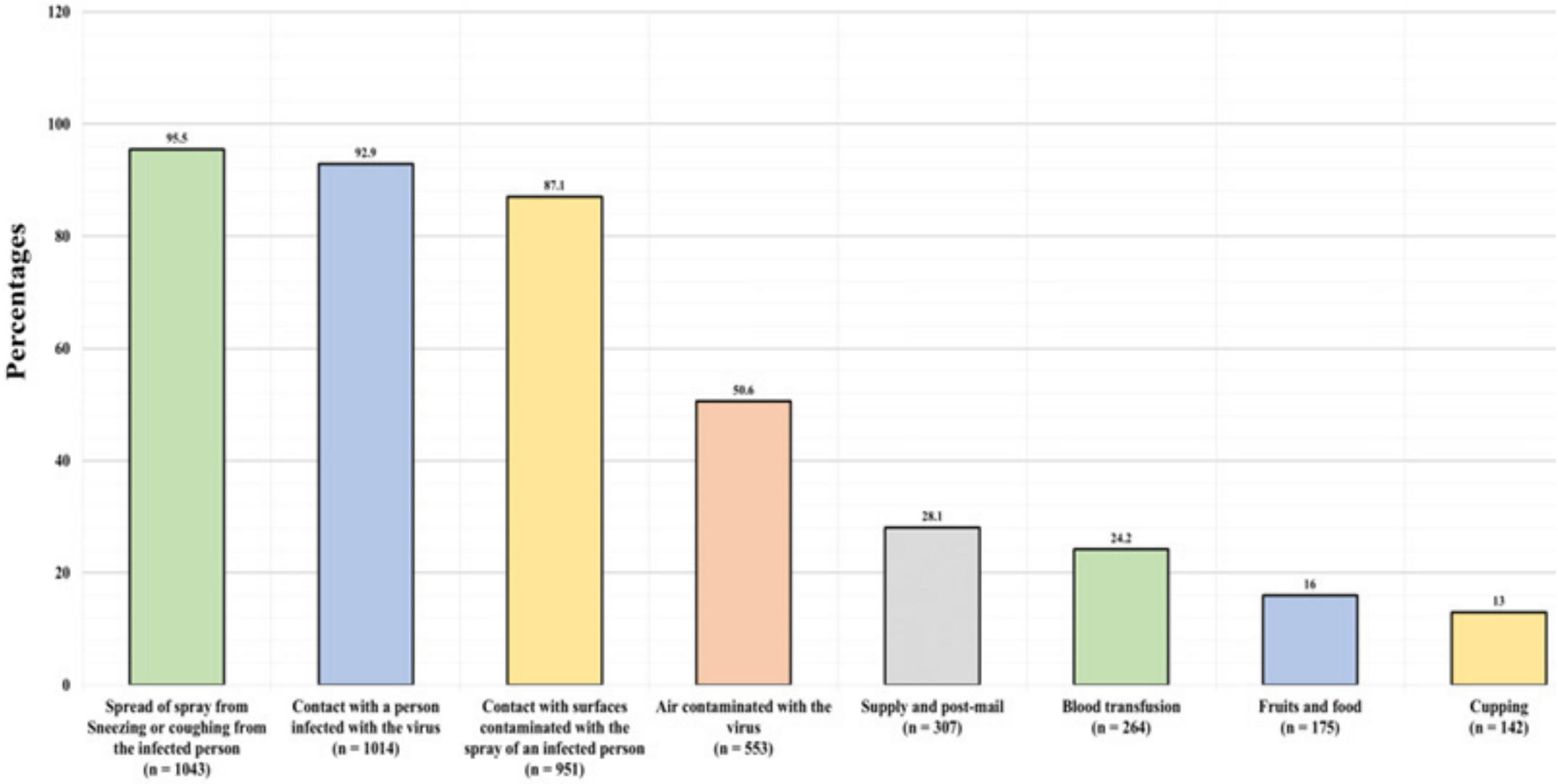

Figure 2 illustrates the participants' responses to questions about the signs and symptoms of COVID-19. The most frequently identified signs and symptoms of COVID-19 were dyspnoea (n=1002, 91.8%), dry or productive cough (n=953, 87.3%), and high fever (≥37.3°C; n=889, 81.4%).

Figure 2. Participants' responses about the signs and symptoms of COVID-19.

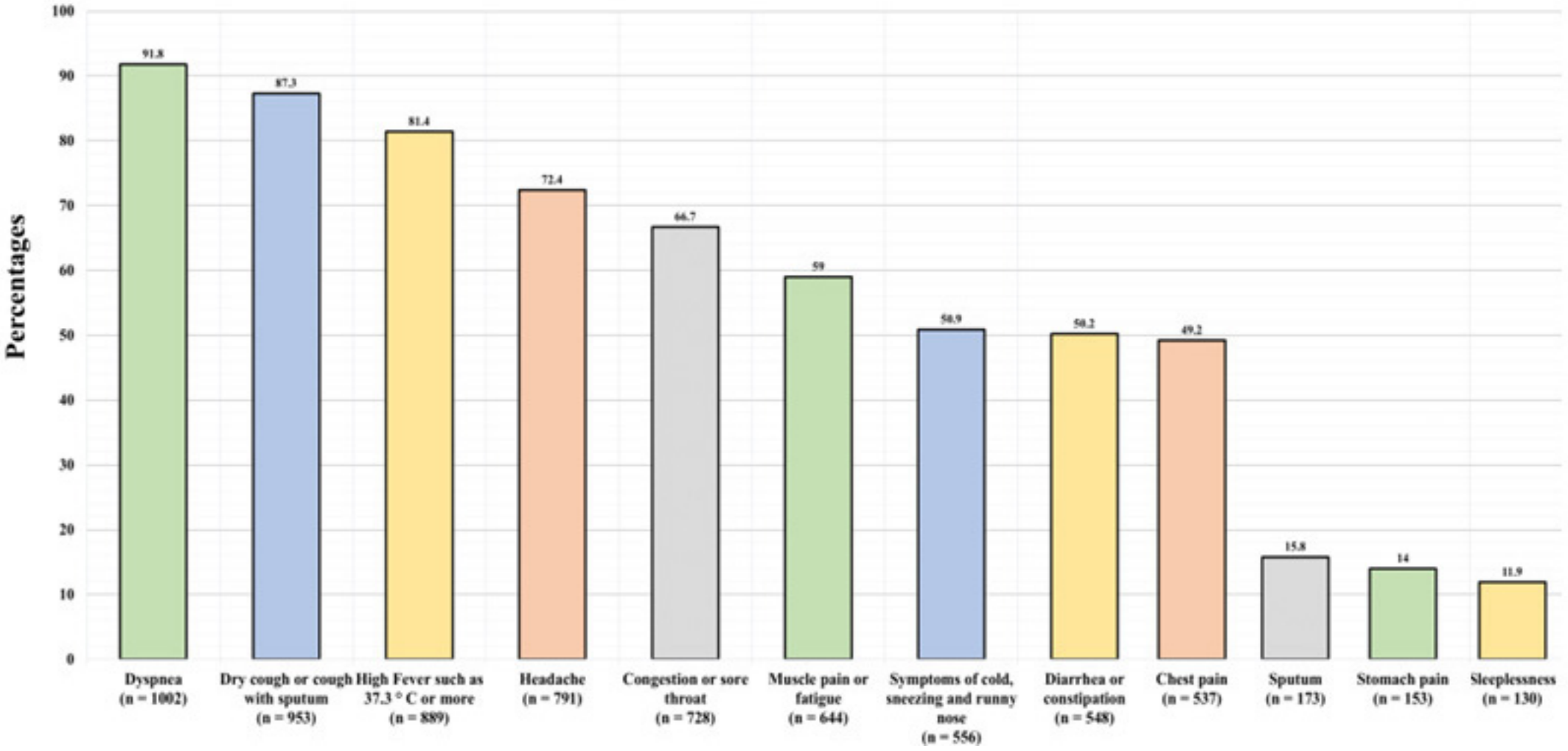

Figure 3 shows the participants' responses to questions about methods of preventing COVID-19, which included "blowing one's nose" and gargling with water, salt, vinegar, and lemon (n=222, 20.3%), spraying the body with sanitizer or chlorine (n=221 (20.2%), and sun exposure (n=126, 11.5%); however, 809 (74.1%) respondents opined that all of the abovementioned methods are not scientifically approved.

Figure 3. Participants' responses about methods for preventing COVID-19

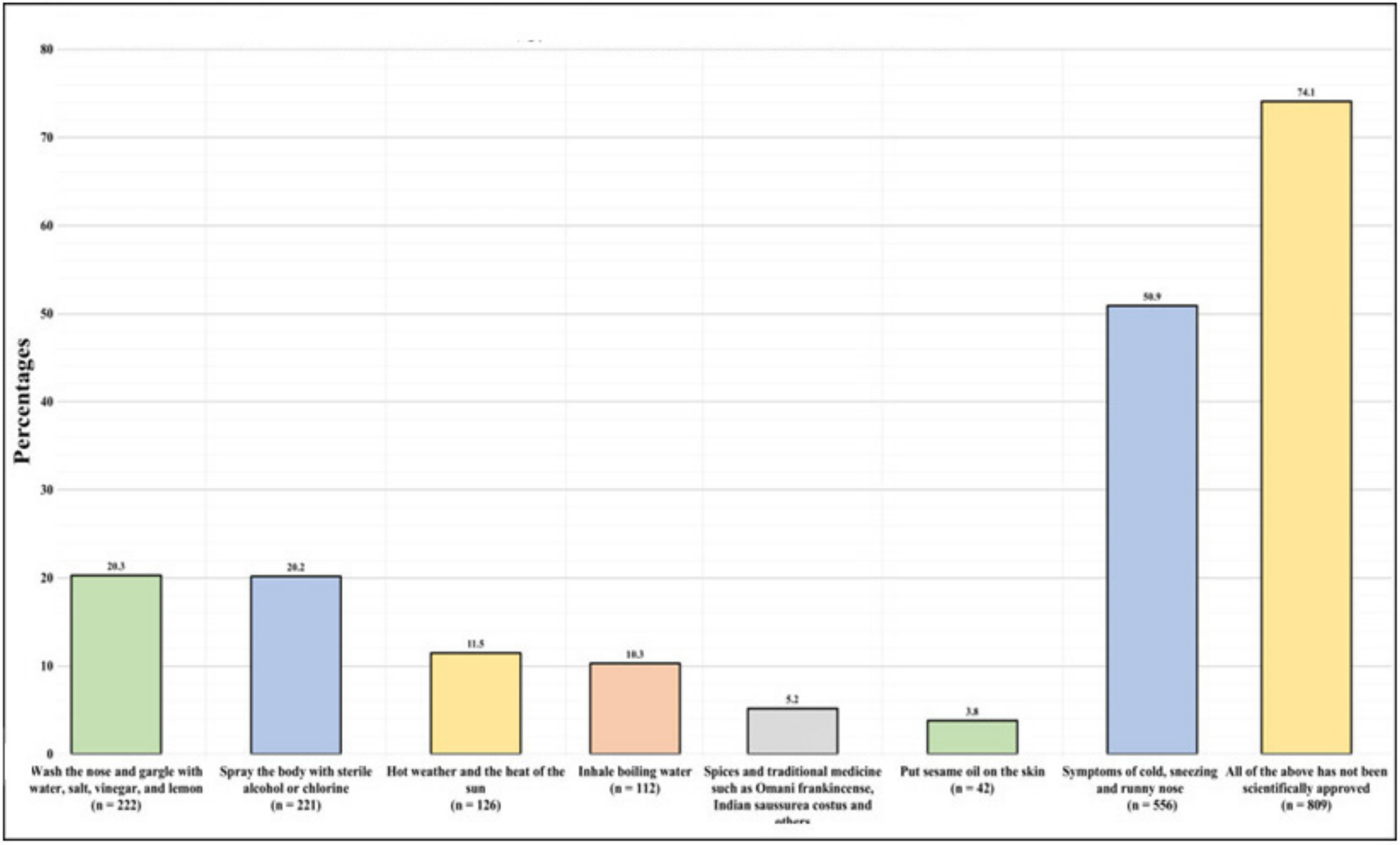

Figure 4 shows the participants' sources of information about COVID-19, which included the official social media accounts (e.g., Twitter) of the Ministry of Health, official news channels, the WHO website, WhatsApp, celebrity's social media accounts (Twitter, Snapchat, Instagram, YouTube, etc.), and other sources for 909 (83.2%), 624 (57.1%), 552 (50.5%), 186 (17%), 63 (5.8%), and 31 (2.8%) respondents, respectively.

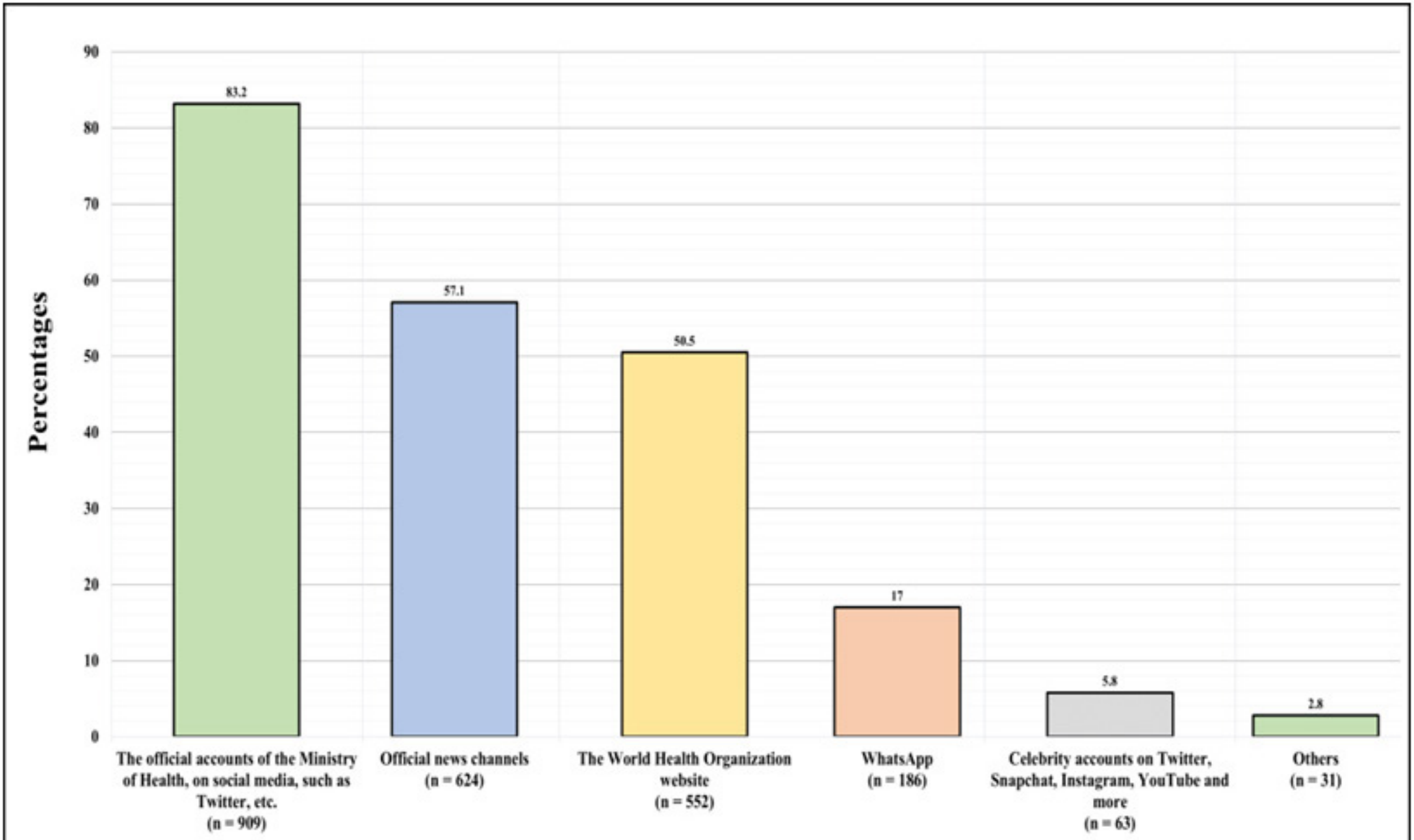

Figure 4, Participants Responses Toward "What is The Source of your Information About COVID-19 ?"

Table 3 displays the participants' attitude towards health-related habits to prevent COVID-19 and their reasons for leaving home; 1040 (95.2%) respondents ensured that they washed their hands appropriately, 1018 (93.2%) avoided shaking hands, 1005 (92%) used masks in crowded places, 988 (90.5%) put a distance of at least a meter between themselves and other people, 973 (89.1%) covered their noses before sneezing, and 966 (88.5%) committed to stay at home. Shopping was the commonest reason for leaving home (Table 3).

Table 3. Participants' attitude towards health-related habits against COVID-19 and their reasons for leaving home

Question	Number (N)	Percentage (%)
Which of the following health-related habits against COVID-19 do you follow?		
• Washing hands with soap and water for at least 40 seconds on returning home and after touching things or others	1040	95.2
• Avoid shaking hands with others	1018	93.2
• Using a mask in crowded places	1005	92
• Keeping distance of at least a meter between oneself and others when talking	988	90.5
• Covering the nose and mouth with a tissue before sneezing or sneezing into the upper arm	973	89.1
• Avoiding use of other people's personal items	951	87.1
• Ensuring that food is very well-cooked	558	51.1
Which of the following reasons are usually responsible for leaving home?		
• "Going out for a picnic"	370	33.9
• "Going out for shopping"	595	54.5
• "Attending a meeting or events"	165	12.2

Table 4 lists the participants' scores of the knowledge levels, attitudes, and practices. The mean knowledge-level score was 29.36 ± 3.8, and 12 (1.1%), 494 (45.2%), and 586 (53.7%) respondents had low, moderate, and high knowledge levels, respectively. The mean attitude score was 10.28 ± 2.56, and 94 (8.6%), 180 (16.5%), and 818 (74.9%) respondents had low, moderate, and high attitude levels, respectively. The mean practice score was 3.67 ± 0.595.

Table 4. Participants' scores for knowledge levels, attitudes, and practices

Knowledge score (Total = 39)		
Mean		29.36
Standard deviation		3.8
Knowledge level	Number	Percentage
Low (0–19), <50%	12	1.1
Moderate (20–29), 50–75%	494	45.2
High (30–39), >75%	586	53.7
Attitude score (Total = 13)		
Mean		10.28
Standard deviation		2.56
Attitude level	Number	Percentage
Low (0–6), <50%	94	8.6
Moderate (7–9), 50–75%	180	16.5
High (10–13), >75%	818	74.9
Practice score (Total = 4)		
Mean		3.67
Standard deviation		0.595

Table 5 shows the relationship between sociodemographic variables and knowledge, attitude, and practice scores. We found a significant relationship between the knowledge score and education ($p<0.001$), wherein a higher education level was associated with a higher mean score of knowledge. Tukey's post hoc test revealed a significant difference between the group of respondents who had high school education and those with a bachelor's degree and with higher education ($p<0.05$). No significant relationship was found between knowledge and sex, age, nationality, or region.

With regard to the attitude, we found a significant difference between the attitude score and sex ($p=0.005$), wherein the mean attitude score of female respondents was higher than that of male respondents (10.56 ± 2.31 vs. 10.11 ± 2.68). Moreover, we found a significant difference in attitude scores across age groups ($p<0.001$); Tukey's post hoc test revealed a significant difference between respondents who were younger than 25 years and those aged 35–39 and 40 years or older ($p<0.05$). Moreover, we found a significant difference between those aged 30–34 years and those aged 35–39 and 40 years or older ($p<0.05$). Furthermore, we found a significant difference between Saudi and non-Saudi respondents ($p=0.015$), wherein a higher score of attitudes was noted in non-Saudis compared to Saudis (11.09 ± 1.74 vs. 10.23 ± 2.59)

For the practices adopted, we found a significant relationship with regard to the age groups ($p=0.006$). Tukey's post hoc test revealed a significant difference between those aged 30–34 years and those aged 35–39 or 40 years and older ($p<0.05$).

Table 5. The relationship between sociodemographic variables and knowledge level, attitude, and practice scores

	Knowledge Score (Total =4)			Attitude Score (Total =4)			Practice Score (Total =4)		
	Mean	SD	*p*-value	Mean	SD	*p*-value	Mean	SD	*p*-value
Sex									
Male	29.23	3.88	0.126	10.11	2.68	0.005*	3.65	0.59	0.130
Female	29.6	3.65		10.56	2.31		3.70	0.60	
Age, years									
<25	29.4	3.57		10.04	2.45		3.64	0.59	
25–29	29.8	3.93	0.159	10.31	2.54	<0.001*	3.62	0.68	0.006*
30–34	28.65	4.14		9.72	3.35		3.56	0.71	
35–40	29.33	3.70		10.91	2.23		3.77	0.44	
>40	29.39	4.09		10.8	2.28		3.76	0.53	
Nationality									
Saudi	29.31	3.71	0.063	10.23	2.59	0.015*	3.67	0.60	0.868
Non-Saudi	30.29	5.22		11.09	1.74		3.56	0.58	
Region									
Central	29.59	4.07		10.41	2.36		3.72	0.49	
Eastern	29.41	3.36	0.350	10.50	2.20	0.800	3.51	0.63	0.071
Northern	31.31	2.39		10.62	1.94		3.92	0.28	
Western	29.42	3.96		10.32	2.98		3.63	0.70	
Southern	29.27	3.78		10.21	2.58		3.67	0.60	
Level of education			< 0.001*						
Primary	27.90	4.33		11.20	1.62		3.40	0.52	
Secondary	28.40	3.86		10.32	2.57	0.445	3.71	0.60	0.116
University	29.64	3.48		10.28	2.48		3.66	0.60	
Postgraduate (masters/doctorate)	30.44	5.37		9.95	3.19		3.57	0.57	

Discussion

Health authorities in the Saudi Arabian Ministry of Health (MOH) have conducted intensive awareness campaigns that were communicated via their website, television (TV), and various social media platforms [17]. Compliance with preventive measures is strongly related to people's awareness and practices [18–21]. A systematic review and meta-analysis of different studies that were published worldwide showed that the overall knowledge level, attitudes, and practice components were at an acceptable level [22].

In this study, two-thirds of the participants were within the age group of less than 30 years, and similar results were reported by Alhazmi et al. and Almofada et al. in two different cross-sectional studies conducted in Saudi Arabia. This could be related to the distribution of the questionnaire through the universities and to the wide use of social media by this age group. In concordance with previous studies [12, 13], the majority of the participants were Saudis and, again, this could be attributed to the distribution of the survey questionnaire through the universities.

Knowledge levels were found to be satisfactory in this study. The majority of the participants had high to moderate knowledge levels, and this finding is in agreement with the results of Zhong et al., in China and Azlan et al., in Malaysia [8, 19]. Al-Hanawi et al, in a recent community-based study that was conducted in Saudi Arabia, reported high knowledge levels among their participants though less knowledge was reported among male and younger participants in the same study [18]. On the other hand, our findings contradict those of multinational cross-sectional studies, from three Middle Eastern Countries (Saudi Arabia, Jordan, and Kuwait), that reported a low level of knowledge about SARS-CoV-2 transmission [8]. This could be explained by the effective widespread communication and awareness programs that have been launched since the beginning of the COVID-19 pandemic. Though the overall levels of knowledge were found to be satisfactory in many different studies, the sub-scales of knowledge were found to be variable. In our study, the participants showed excellent knowledge levels with regard to the disease transmission, causative agent, and clinical presentation sub-scales of knowledge. Alhazmi et al. reported average knowledge levels on the transmission sub-scale and low knowledge levels on the disease severity and complications [12]. Mabrouk et al., in a regional study undertaken in the Qassim region of Saudi Arabia, reported adequate awareness of COVID-19; however, the result was limited by the regional nature of the study [23].

In this study, the knowledge levels were significantly related to degree of education and were unaffected by the nationality, age group, or sex. Most of the previous studies supported a correlation between the level of knowledge and the degree of education [8, 12] and attributed this to the fact that education facilitates widespread communication and delivery of education programs. A similar study that was conducted in the USA reported better awareness in women compared to men [24].

The attitude sub-scales of washing hands appropriately, avoiding shaking hands, using masks in crowded places, and physical distancing were not satisfactory in this study. These findings are consistent with those of other studies that were previously conducted in Saudi Arabia by Alhanofa et al. and Al-Hanawi et al. Interestingly, in this study, the attitude was significantly correlated with the sex and the age group, with a higher score in female rather than male respondents and in the age group of participants who were younger than 25 years than in any other age group. Theoretically, participants' knowledge levels, attitudes, and even the practices are supposed to be linearly correlated with their educational levels; however, the mechanisms by which different sex and age groups affect this relationship need to be investigated in large cross-sectional and quantitative studies.

The overall practices with regard to preventing COVID-19 in Saudi Arabia have significantly improved since the emergence of the pandemic. Al-Hanawi et al. reported that the participants' score for practices related to COVID-19 was 4.34 out of 5, and Alhazmi et al. reported a score of 81.9 out of 100. In this study, the overall practice score was 3.8 out of 4 which was even better than the outcomes of previous studies and indicates an overall improvement in the practices associated with COVID-19 awareness and prevention. The knowledge level, attitudes, and practice scores were linearly correlated in this study, similarly as in previous studies that were conducted in Saudi Arabia, and possibly reflect a high impact of the implementation of preventive services and education programs [12, 13].

This study reflected the overall progression and improvement in the participant's awareness since the beginning of the COVID-19 pandemic in March 2020 in Saudi Arabia and is an indicator of the effectiveness of the preventive measures implemented by the health authorities. However, this study is not without limitations. The cross-sectional design and the small sample size are limitations that preclude the generalization of the results. Due to the lockdown and the difficulties in the distribution of the online survey questionnaire, the results appear to be restricted to individuals who are in contact with social media and universities and are not representative of the general community.

Conclusion

The preventive measures and awareness programs implemented by health authorities in Saudi Arabia have successfully controlled the spread of SARS-CoV-2, limited the emergence of new COVID-19 cases, and increased the public awareness about disease transmission and prevention. The overall awareness and practices of the Saudi population have been considerably improved since the beginning of the COVID-19 pandemic. A greater emphasis should be directed towards education programs among individuals with poor access to social media and those with low education to ensure a whole-community representative public awareness about COVID-19.

References

[1] Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727–33. https://doi.org/10.1056/NEJMoa2001017

[2] World Health Organization. Naming the coronavirus disease (COVID-19) and the virus that causes it, https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it; 2020 [accessed 16 April 2020].

[3] Alyami MH, Naser AY, Orabi MAA, Alwafi H, Alyami HS. Epidemiology of COVID-19 in the Kingdom of Saudi Arabia: An ecological study. Front Public Health 2020;8:506. https://doi.org/10.3389/fpubh.2020.00506

[4] Al-Rabiaah A, Temsah MH, Al-Eyadhy AA, Hasan GM, Al-Zamil F, Al-Subaie S, et al. Middle East Respiratory Syndrome-Corona Virus (MERS-CoV) associated stress among medical students at a university teaching hospital in Saudi Arabia. J Infect Public Health 2020;13:687–91. https://doi.org/10.1016/j.jiph.2020.01.005

[5] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med 2020;382:1199–207. https://doi.org/10.1056/NEJMoa2001316

[6] Ralph R, Lew J, Zeng T, Francis M, Xue B, Roux M, et al. 2019-nCoV (Wuhan virus), a novel coronavirus: human-to-human transmission, travel-related cases, and vaccine readiness. J Infect Dev Ctries 2020;14:3–17. https://doi.org/10.3855/jidc.12425

[7] World Health Organization. COVID 19 Public Health Emergency of International Concern (PHEIC) Global research and innovation forum: towards a research roadmap. 2020. p. 1–7.

[8] Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int J Biol Sci 2020;16:1745–52. https://doi.org/10.7150/ijbs.45221

[9] Naser AY, Dahmash EZ, Alwafi H, Alsairafi ZK, Al Rajeh AM, Alhartani YJ, et al. Knowledge and practices towards COVID-19 during its outbreak: a multinational cross-sectional study. Medrxiv 2020. doi:10.1101/2020.04.13.20063560.

[10] Bazaid AS, Aldarhami A, Binsaleh NK, Sherwani S, Althomali OW. Knowledge and practice of personal protective measures during the COVID-19 pandemic: A cross-sectional study in Saudi Arabia. PLoS One 2020;15:e0243695. https://doi.org/10.1371/journal.pone.0243695

[11] Alahdal H, Basingab F, Alotaibi R. An analytical study on the awareness, attitude and practice during the COVID-19 pandemic in Riyadh, Saudi Arabia. J Infect Public Health 2020;13:1446–52. https://doi.org/10.1016/j.jiph.2020.06.015

[12] Alhazmi A, Ali MHM, Mohieldin A, Aziz F, Osman OB, Ahmed WA. Knowledge, attitudes and practices among people in Saudi Arabia regarding COVID-19: A cross-sectional study. J Public Health Res 2020;9:1867. https://doi.org/10.4081/jphr.2020.1867

[13] Almofada SK, Alherbisch RJ, Almuhraj NA, Almeshary BN, Alrabiah B, Al Saffan A, et al. Knowledge, attitudes, and practices toward COVID-19 in a Saudi Arabian population: A cross-sectional study. Cureus 2020;12:e8905. https://doi.org/10.7759/cureus.8905

[14] World Population Review. Saudi Arabia Population 2021 (Demographics, Maps, Graphs). https://worldpopulationreview.com/countries/saudi-arabia-population. [accessed 10 April 2021].

[15] Harbage B, Dean AG. Distribution of Epi Info software: an evaluation using the Internet. Am J Prev Med 1999;16:314–7. https://doi.org/10.1016/s0749-3797(98)00101-9

[16] Fetters L, Tilson J. Evidence based physical therapy. 2nd ed. Philadelphia: FA Davis Company; 2018.

[17] WHO Regional Office for the Eastern Mediterranean. WHO, Saudi Arabia join forces to fight COVID-19 nationally, regionally and globally 2020, http://www.emro.who.int/media/news/who-saudi-arabia-join-forces-to-fight-covid-19-nationally-regionally-and-globally.html; 2020 [accessed 2 April 2020].

[18] Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, et al. Knowledge, attitude and practice toward COVID-19 among the public in the Kingdom of Saudi Arabia: A cross-sectional study. Front Public Health 2020;8:217. https://doi.org/10.3389/fpubh.2020.00217

[19] Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. PLoS One 2020;15:e0233668. https://doi.org/10.1371/journal.pone.0233668

[20] Lin Y, Hu Z, Alias H, Wong LP. Knowledge, attitudes, impact, and anxiety regarding COVID-19 infection among the public in China. Front Public Health 2020;8:236. https://doi.org/10.3389/fpubh.2020.00236

[21] Yap J, Lee VJ, Yau TY, Ng TP, Tor PC. Knowledge, attitudes and practices towards pandemic influenza among cases, close contacts, and healthcare workers in tropical Singapore: a cross-sectional survey. BMC Public Health 2010;10:442. https://doi.org/10.1186/1471-2458-10-442

[22] Saadatjoo S, Miri M, Hassanipour S, Ameri H, Arab-Zozani M. Knowledge, attitudes, and practices of the general population about coronavirus disease 2019 (COVID-19): a systematic review and meta-analysis with policy recommendations. Public Health 2021;194:185–95. https://doi.org/10.1016/j.puhe.2021.03.005

[23] Al-Rasheedi M, Alhazmi Y, Mateq Ali A, ALrajhi M, Alharbi NS, Alsuhaibani S, et al. Public and healthcare providers awareness of coronavirus (COVID-19) in Qassim Region, Saudi Arabia. Saudi J Biol Sci 2021;28:90–8. https://doi.org/10.1016/j.sjbs.2020.08.035

[24] Alsan M, Stantcheva S, Yang D, Cutler D. Disparities in coronavirus 2019 reported incidence, knowledge, and behavior among US adults. JAMA Netw Open 2020;3:e2012403. https://doi.org/10.1001/jamanetworkopen.2020.12403

Physical activity levels during Covid-19 among nurses at a Saudi teaching hospital: a cross sectional study

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Abstract

Background: Previous studies have revealed that despite evidence of the advantages of exercise, nurses have one of the lowest levels of physical activity participation across all occupational groups.

Methods: a cross sectional study was done on 316 nurses at King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia. An online questionnaire was used to collect demographic data, work conditions, smoking status and chronic diseases .The International Physical Activity Questionnaire (IPAQ) was used to assess the physical activity level.

Results: The nurses in the trial had a considerably higher number of days spent doing vigorous and moderate physical activities a week before Covid-19, as well as spending more time doing them. Furthermore, they had a considerably higher percentage of days walking for at least 10 minutes at a time in a random week before the Covid-19 pandemic. According to the International Physical Activity Questionnaire (IPAQ), 32.6 percent, 40.2 percent, and 27.2 percent of the nurses in the study, respectively, had a low, moderate, or high level of physical activity, compared to 3.2 percent, 36.4 percent, and 60.4 percent a week before the pandemic. Nurses who were married, lived in villas, and earned a monthly salary of 10,000-20,000 S.R. had a higher level of physical activity.

Conclusions: Hospital management should provide in-service education courses on healthy behaviors and physical activity to nurses in order to maintain their health and ensure higher levels of performance.

Keywords: physical, activity, Covid-19, nurses, teaching, Jeddah

Introduction

The corona virus outbreak (Covid-19) has spread throughout the world [1,2]. The epidemic was first discovered in Wuhan, China, in December 2019 [3]. On March 2, 2020, the first confirmed case of Covid-19 were reported in Saudi Arabia. There have been 375,333 confirmed cases of Covid-19 since March 2021, with 6,466 confirmed deaths [4-5].

Adults aged 18 to 64 should engage in 150–300 minutes of moderate-intensity aerobic physical activity, 75–150 minutes of vigorous-intensity aerobic physical activity, or a combination of moderate- and vigorous-intensity activity throughout the week, according to the World Health Organization [6]. Physical activity has several health benefits, including aiding in the management and prevention of diseases such as diabetes, cardiovascular disease, cancer, and other noncommunicable diseases. Around the world, 80 percent of teenagers are reported to be insufficiently physically active. It is also predicted that one out of every four persons does not achieve the global physical activity recommendations [6].

Healthy asymptomatic adults should engage in moderate-intensity exercise during the Covid-19 pandemic, according to a previous study, while high-intensity exercises will necessitate extra caution [7].

Nurses are the largest professional category in the healthcare workforce [8]. Despite evidence of favorable effects from exercise participation, previous research has found that nurses have one of the lowest levels of physical activity engagement among professional categories [8-9]. This topic has been explored in prior research publications to our knowledge; nonetheless, our goal is to strengthen the findings on this topic in Saudi Arabia's western region. We anticipate that the results will demonstrate a decrease in physical activity among nurses as a result of the Covid-19 epidemic.

Subjects and Methods

Study design and time frame: a cross sectional study was done in the time from December 2021 to January 2022.

Study setting: the study was conducted at KAUH (King Abdulaziz University Hospital), Jeddah, Saudi Arabia.

Sampling technique: a simple random sampling methodology was followed.

Study participants: the inclusion criteria were all registered nurses working in all wards of the hospital regardless of years of experience. And the exclusion criteria were all nursing interns and students.

Study instrument: a predesigned questionnaire was used to collect data about participants demographics, duration in KSA, duration of work in KAUH, work department, smoking status and chronic diseases. The participants' physical activity level was assessed by the International Physical Activity Questionnaire (IPAQ). Physical activity categories were determined based on the International Physical Activity Questionnaire (IPAQ) MET minutes scoring. A high level of physical activity on the IPAQ suggests that the physical activity levels amount to at least one hour of moderate intensity activity per day. Those with a high IPAQ score engage in vigorous intensity activity on at least three days per week, achieving a minimum total physical activity of 1500 MET minutes per week, or 7 or more days of any combination of walking, moderate intensity, or vigorous intensity activities, achieving a minimum total physical activity of 3000 MET minutes per week. On most days, scoring a moderate level of physical activity on the IPAQ suggests you're doing something roughly similar to half an hour of moderate intensity physical exercise. Those with a moderate IPAQ score engage in 3 or more days of vigorous intensity activity and/or 30 minutes of walking per day, 5 or more days of moderate intensity activity and/or 30 minutes of walking per day, or 5 or more days of any combination of walking, moderate intensity, or vigorous intensity activities, achieving a minimum total physical activity of at least 600 MET minutes per week. Scoring a low level of physical activity on the IPAQ means that you are not meeting any of the criteria for either moderate of high levels of physical activity [10,11].

Statistical analysis: data were analyzed statistically using (SPSS) version 25. To test the relationship between variables, qualitative data was expressed as numbers and percentages, and the Chi-squared test ($\chi 2$) was used. Quantitative data was expressed as mean and standard deviation (Mean ± SD), and non-parametric variables were tested using the Mann-Whitney and Kruskal Wallis tests. McNemar test was used to compare physical activity before and after COVID-19 pandemic. A p-value of less than 0.05 was considered statistically significant.

Results

(Table 1) shows that the mean age of studied nurses was 36.91 ±5.56 years, 89.6 were females, 75% were married and 89.9% were living in apartments. Of them, 90.8% had a monthly income < 10,000 S., 37.7% have been living for 6-10 years in KSA and 38.8% were working in KAUH for 6-10 years.

Table 1. Distribution of studied nurses according to their demographic characters, duration in KSA and duration of work in KAUH (No.:316)

Variable	No. (%)
Age	36.91 5.56
BMI	25.36 1.99
Gender	
Female	283 (89.6)
Male	33 (10.4)
Marital status	
Not married	51 (16.1)
Married	237 (75)
Divorced	28 (8.9)
Housing type	
Apartment	284 (89.9)
Villa	12 (3.8)
Other	20 (6.3)
Monthly income	
< Under 10,000 S.R	287 (90.8)
10,000-20,000 S.R	29 (9.2)
How long have you been living in Saudi Arabia?	
Less than 1 year	4 (1.3)
1-5 years	80 (25.3)
6-10 years	113 (35.8)
More than 10 years	119 (37.7)
How long have you worked as a nurse in KAUH?	
Less than 1 year	7 (2.2)
1-5 years	91 (28.8)
6-10 years	122 (38.6)
More than 10 years	96 (30.4)

(Table 2) shows that most of the participant nurses (16.1%) were working at the medical department, followed by the pediatric department and the cardiac department. About 5% (5.4%) were current smokers, and 31.3% had chronic diseases with hypertension (15.8%) being the most common disease.

Table 2. Distribution of studied nurses according department in KAUH, smoking status and chronic diseases (No.:316)

Variable	No. (%)
Which department do you work in at KAUH?	
Medical	51 (16.1)
Family medicine	6 (1.9)
Wound care	6 (1.9)
Isolation	1 (0.3)
ICU	11 (3.5)
PICU	1 (0.3)
NICU	2 (0.6)
ER	21 (6.6)
Pediatric ER	1 (0.3)
Labor room	7 (2.2)
OR	13 (4.1)
Surgical	16 (5.1)
Other...	94 (29.7)
Pediatric	28 (8.9)
Cardiac	18 (5.7)
Radiology	6 (1.9)
ENT	3 (0.9)
Psychiatry	5 (1.6)
Ophthalmology	1 (0.3)
OB/GYN	25 (7.9)
Smoking	
Yes	17 (5.4)
No	288 (91.1)
Ex-smoker	11 (3.5)
Chronic illness	
Yes	99 (31.3)
No	217 (68.7)
What chronic disease?	
Diabetes mellitus	8 (2.5)
Hypertension	50 (15.8)
Dyslipidemia	25 (7.9)
Thyroid disorder	16 (5.1)
None	217 (68.7)

(Table 3) shows that in a random week before Covid-19, studied nurses had a significantly higher percent of having more days of doing vigorous physical activities like heavy lifting, jogging compared to a week after Covid-19 (p=> 0.05). In addition, they showed a highly significant higher percent of spending more time in doing vigorous physical activities on one of those days (p=> 0.05).

At the same time, a random week before Covid-19, nurses had a significant higher percent of doing moderate physical activities (that do not include walking) compared to a week after Covid-19 (p=> 0.05). And they had a highly significantly higher percent of spending more time doing moderate physical activities on one of those days.

Nurses also had a significant higher percent of having more days walking for at least 10 minutes at a time in a random week before Covid-19 compared to a week after Covid-19 (p=> 0.05). They also had a highly significantly higher percent of spending more time walking on one of those days (p=> 0.05). Studied nurses showed a significant higher percent of spending more time sitting on a week day in a random week before Covid-19 compared to a week after Covid-19 (p=> 0.05).

Table 3. Difference between participants' responses to items of the International Physical Activity Questionnaire (IPAQ) during the last 7 days and a random week before the COVID-19

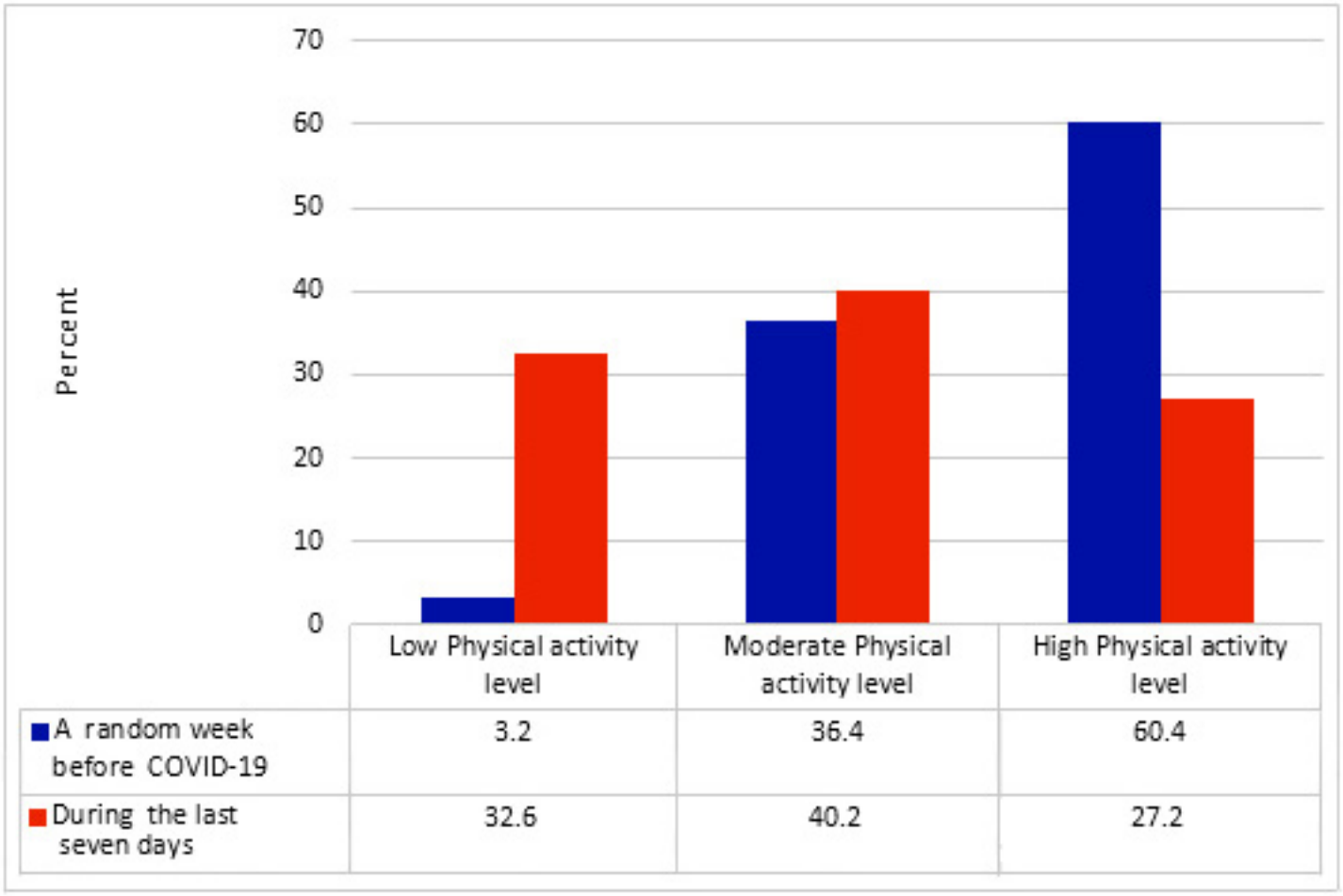
Variable	During COVID-19		A random week before COVID-19		x^2	P-value
	Question response	No. (%)	Question response	No. (%)		
Q1Q1 During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?	1 2 3 5 None (mean ±SD)	1 (0.3) 3 (0.9) 1 (0.3) 2 (0.6) 309 (97.8) 0.07 ±0.48	1 2 3 4 7 None (mean± SD)	2 (0.6) 3 (0.9) 1 (0.3) 1 (0.3) 1 (0.3) 308 (97.5) 2.75 1.98	97.75	< 0.001
Q2 How much time (hours or minutes per day) did you usually spend doing vigorous physical activities on one of those days?	30 45 60 90 None (mean ±SD)	1 (0.3) 1 (0.3) 5 (1.6) 1 (0.3) 308 (97.5) 1.47 9.48	20 45 60 90 None (mean ±SD)	1 (0.3) 1 (0.3) 5 (1.6) 1 (0.3) 308 (97.5) 3.93 2.37	64	< 0.001
Q3 During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicyding at a regular pace, or doubles tennis? (Do not indude walking)	1 2 3 4 7 None (mean ±SD)	2 (0.6) 6 (1.9) 2 (0.6) 1 (0.3) 4 (1.3) 301 (95.3) 0.16 ±0.88	1 2 3 4 7 None (mean ±SD)	1 (0.3) 6 (1.9) 1 (0.3) 2 (0.6) 5 (1.6) 301 (95.3) 0.17 ±0.87	52.42	< 0.001
Q4 How much time (hours or minutes per day) did you usually spend doing moderate physical activities on one of those days?	120 15 30 40 60 None (mean ±SD)	5 (1.6) 2 (0.6) 3 (0.9) 2 (0.6) 3 (0.9) 301 (95.3) 3.1 ± 16.53	15 30 40 90 120 180 None (mean ±SD)	1 (0.3) 6 (1.9) 2 (0.6) 1 (0.3) 3 (0.9) 2 (0.6) 310 (95.3) 72.33 ±57.59	89.99	< 0.001

(Table 3. Difference between participants' responses to items of the International Physical Activity Questionnaire (IPAQ) during the last 7 days and a random week before the COVID-19 continued)

Q5 Duringthe last7 days, on how many days did you walkfor at least10 minutes at a time?	2 4 5 6 7 None (mean±SD)	2 (0.6) 1 (0.3) 9 (2.8) 1 (0.3) 300 (94.9) 3 (0.9) 6.83± 0.86	1 3 5 7 8 None (mean±SD)	4 (1.3) 1 (0.3) 10 (3.2) 295 (93.4) 1 (0.3) 5 (1.6) 6.85± 0.79	29.93	< **0.001**
Q6 How much time (hours or minutes per day) did you usually spend walking on one of those days?	10 120 15 150 180 20 240 25 30 40 60 None (mean±SD)	4 (1.3) 57 (18) 4 (1.3) 4 (1.3) 21 (6.6) 30 (9.5) 4 (1.3) 46 (14.6) 90 (28.5) 4 (1.3) 36 (11.4) 16 (5.1) 60.28 ±54.4	15 20 25 30 45 60 90 120 150 160 80 None (mean±SD)	2 (0.6) 1 (0.3) 1 (0.3) 3 (0.9) 2 (0.6) 110(34.8) 1 (0.3) 116 (36.7) 2 (0.6) 2 (0.6) 71 (22.5) 5 (1.6) 110.18± 47.65	15.6	< **0.001**
Q7 Duringthe last7 days, how much time (hours or minutes per day) didyou spend sitting on a week day?	1 10 12 15 2 3 4 5 6 7 8 9 (mean±SD)	12 (3.8) 27 (8.5) 3 (0.9) 1 (0.3) 16 (5.1) 4 (1.3) 4 (1.3) 18 (5.7) 46 (14.6) 51 (16.1) 79 (25) 55 (17.4) 7.1 ±2.34	1 10 11 12 2 3 4 5 6 7 8 9 (mean±SD)	5 (1.6) 27 (8.5) 1 (0.3) 3 (0.9) 8 (2.5) 5 (1.6) 4 (1.3) 17 (5.4) 51 (16.1) 54 (17.1) 82 (25.9) 59 (18.7) 7.36 ±1.97	36.9	< **0.001**

(Figure 1) illustrated that during a random week after Covid-19; 32.6%, 40.2% and 27.2% of studied nurses had a low, moderate, and high physical activity level based on the International Physical Activity Questionnaire (IPAQ) MET minutes scoring. A random week before the Covid-19 3.2%, 36.4% and 60.4% of studied nurses had a low, moderate, and high physical activity level based on the International Physical Activity Questionnaire (IPAQ) MET minutes scoring. There was a significant difference between the physical activity levels in the two periods in the favor of the random week before COVID-19 (p= < 0.05).

Figure1. Relationship between physical activity categories among studied nurses a random week before the COVID-19 and during the last seven days



	Low Physical activity level	Moderate Physical activity level	High Physical activity level
A random week before COVID-19	3.2	36.4	60.4
During the last seven days	32.6	40.2	27.2

(McNemar-Bowker Test = 11.48, p= 0.022).

(Table 4) shows that a non-significant relationship was found between Physical activity categories among studied nurses after Covid-19 and their demographic characters, smoking status and chronic diseases (p=> 0.05).

Table 4. Relationship between physical activity categories among studied nurses a random week afterthe COVID-19 and their demographic characters, smoking status and chronic diseases (No.:316)

Variable	Physical activity level			X_2	P-value
	Low No. (%)	Moderate No. (%)	High No. (%)		
Age	37.48 ±5.66	36.46± 5.33	36.92± 5.76	2*	0.605
BMI	25.4 ±2.1	25.48 ±2.01	25.13 ±1.83	2*	0.492
Gender					
Female	91 (32.2)	111 (39.2)	81 (28.6)	2.76	0.251
Male	12 (36.4)	16 (48.5)	5 (15.2)		
Marital status					
Not married	15 (29.4)	23 (45.1)	13 (25.5)	2.8	0.591
Married	80 (33.8)	95 (40.1)	62 (26.2)		
Divorced	8 (28.6)	9 (32.1)	11 (39.3)		
Smoking					
Yes	3 (17.6)	10 (58.8)	4 (23.5)	3.63	0.457
No	96 (33.3)	114 (39.6)	78 (27.1)		
Ex-smoker	4 (36.4)	3 (27.3)	4 (36.4)		
Chronic illness					
Yes	32 (32.3)	41 (41.4)	26 (26.3)	0.1	0.949
No	71 (32.7)	86 (39.6)	60 (27.6)		
Housing type					
Apartment	90 (31.7)	117 (41.2)	77 (27.1)	1.8	0.771
Villa	5 (41.7)	3 (25)	4 (33.3)		
Other	8 (40)	7 (35)	5 (25)		
Monthly income					
< Under10,000 S.R	98 (34.1)	114 (39.7)	75 (26.1)	3.82	0.148
10,000-20,000 S.R	5 (17.2)	13 (44.8)	11 (37.9)		

N.B.: * = Kruskal Wallis test

(Table 5) shows that in a random week before the Covid-19; married nurses, those living in villas and those having a monthly income ranging from 10,000-20,000 S.R had a significantly higher percent of those who had a high physical activity level (p=< 0.05).

Table 5. Relationship between physical activity categories among studied nurses a random week before the COVID-19 and their demographic characters, smoking status and chronic diseases (No.:316)

Variable	Physical activity level			X_2	P-value
	Low No. (%)	Moderate No. (%)	High No. (%)		
Age	40.9 ±7.5	36.95 ± 6.12	36.96 ± 5.02	2*	2.82
BMI	26.66 ± 3.29	25.06 ± 2.3	25.5 ±1.7	2*	2.95
Gender					
Female	8 (2.8)	104 (36.7)	171 (60.4)	1.07	0.585
Male	2 (6.1)	11 (33.3)	20 (60.6)		
Marital status					
Not married	4 (7.8)	22 (43.1)	25 (49)	11.08	**0.026**
Married	6 (2.5)	78 (32.9)	153 (64.6)		
Divorced	0 (0.0)	15 (53.6)	13 (46/4)		
Smoking					
Yes	0 (0.0)	7 (41.2)	10 (58.8)	3.17	0.53
No	9 (3.1)	106 (36.8)	173 (60.1)		
Ex-smoker	1 (9.1)	2 (18.2)	8 (72.7)		
Chronic illness					
Yes	4 (4)	32 (32.3)	63 (63)	1.24	0.536
No	6 (2.8)	83 (38.2)	128 (59)		
Housing type					
Apartment	6 (2.1)	101 (35.6)	177 (62.3)	23.69	< **0.001**
Villa	0 (0.0)	4 (33.3)	8 (66.7)		
Other	4 (20)	10 (50)	6 (30)		
Monthly income					
< Under10,000 S.R	9 (3.1)	113 (39.4)	165 (57.5)	12.14	**0.002**
10,000-20,000 S.R	1 (3.4)	2 (6.9)	26 (89.7)		

N.B.: * = Kruskal Wallis test

Discussion

This study aimed to assess the physical activity level during Covid-19 among Saudi nurses. Based on our study's results, the physical activity levels have definitely been impacted by the Covid-19 pandemic.

Prior to the Covid-19 epidemic, physical activity levels among the nurses surveyed were generally greater. Nurses had a significantly greater % of days completing vigorous and moderate physical activity, as well as more days walking for at least 10 minutes, in a random week prior to Covid-19.

Staff nurses are at a higher risk of musculoskeletal injuries as a result of lifting, transporting patients, and other postural requirements of their job [12]. These injuries have an effect on not only their health but also their work performance and productivity [13].

Existing data confirms that physical activity levels among study nurses were low even before the pandemic. According to a study conducted by Saridi et al. 2019 [14], most staff nurses have a low level of physical activity due to a lack of free time and lengthy working hours, as well as a lack of interest in participating in physical activity [14]. At the same line, Chin et al. (2016) [15] found that most of nurses don't engage in regular aerobic physical activity. In addition, Molina (2017) discovered that healthcare professionals have low levels of physical activity [16].

This outcome, however, differed from that seen in earlier international research. According to Bakhshi et al. (2015) [17], a large percentage of registered nurses are physically active. In terms of national research, a recent Saudi study found that 60.2 percent of nurses exercised, with walking being the most common sort of physical activity indicated by 66.1 percent of respondents [18].

The present body of knowledge on the degree of physical activity following the Covid-19 pandemic is extremely sparse. Our hypothesis was that the pandemic had a negative impact on physical activity levels, and our hypothesis was proven right. This was in line with a recent study that looked into the link between physical activity levels and the mental health burden of healthcare personnel in Singapore during the Covid-19 lockdown. The study discovered that these healthcare workers' exercise frequency, length, and intensity decreased considerably during the lockdown compared to before the lockdown. Moderate-to-extremely-severe depression, anxiety, and stress were found in 25.3 percent, 37.2 percent, and 11.9 percent of the participants, respectively. Exercise duration reductions were revealed to be a major risk factor for mild stress and moderate-to-severe depression, but increased exercise frequency was proven to be a protective factor against sad mood [19]. Our data confirms that the introduction of lockdown has considerably interrupted the exercise habits of healthcare professionals [20,21], which is consistent with research assessing the impact of lockdown on the general population.

The effect of stress on the nursing staff is one element that could contribute to the reported outcomes. Nurses are already stressed out during their shifts, and the Covid-19 pandemic has just added to their workload and stress levels. As a result, nurses who had time for physical activity prior to the Covid-19 pandemic now have less time and energy [19]. It's also likely that gyms, parks, and other places where people can engage in physical activity are limited. The majority of nurses' physical activity comprised walking, according to our findings. Perhaps our findings would be drastically different if the nurses in this study had greater access to physical activity facilities with more equipment and activities (e.g. cycles, weights, swimming pools, etc.) [22,23].

Nurses' job performance reflects the quality of care provided and, as a result, patient outcomes, and if staff nurses are not physically fit or ignore their own health behaviors, not only will their health suffer, but so will their performance [24].

The strength of our study includes the number of participants and variety of nurses from different sectors of the hospital.

Limitations

A limitation of the present study is the use of a pre-designed questionnaire that may have a recall bias. The limited participation of certain sectors of the hospital was another limitation.

Conclusion

The current study found that a week before COVID-19, the nurses in the study had a significantly greater percentage of days spent undertaking vigorous and moderate physical activities, as well as spending more time doing these activities. Furthermore, in a random week prior to Covid-19, they had a significantly higher percentage of days walking for at least 10 minutes at a time. According to the International Physical Activity Questionnaire (IPAQ), 32.6 percent, 40.2 percent, and 27.2 percent of the nurses in the study had a low, moderate, or high level of physical activity, respectively, compared to 3.2 percent, 36.4 percent, and 60.4 percent a week before the pandemic. Married nurses, those who lived in villas, and those with a monthly salary of 10,000-20,000 S.R. had a significantly greater percentage of those who exercised before the pandemic. To maintain nurses' health and assure higher levels of performance, hospital management should offer in-service education sessions on healthy behaviors and physical activity.

Ethical approval: The ethical approval was obtained from the Committee of Bioethics at King Abdulaziz University (KAUH).

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References

1- Arshad Ali S, Baloch M, Ahmed N, Arshad Ali A, Iqbal A. The outbreak of Coronavirus Disease 2019 (COVID-19) - An emerging global health threat. J Infect Public Health. 2020; (4):644-46. doi: 10.1016/j.jiph.2020.02.033.

2- Islam MS, Ferdous MZ, Potenza MN. Panic and generalized anxiety during the COVID-19 pandemic among Bangladeshi people: An online pilot survey early in the outbreak. J Affect Disord. 2020;276:30-37. doi: 10.1016/j.jad.2020.06.049

3- Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, Tan KS, Wang DY, Yan Y. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status. Mil Med Res. 2020;7(1):11-21. doi: 10.1186/s40779-020-00240-0.

4- World Health Organization. Saudi Arabia. https://www.who.int/countries/sau/. 2021.

5- Saudi Ministry of Health (MOH). Saudi Arabia. MOH reports first case of coronavirus infection.2020. https://www.moh.gov.sa/en/Ministry/MediaCenter/News/Pages/News-2020-03-02-002.aspx

6- https://www.who.int/news-room/fact-sheets/detail/physical-activityWorld Health Organization. Physical Activity. 2021. https://www.who.int/news-room/fact-sheets/detail/physical-activity.

7- Chen P, Mao L, Nassis GP, Harmer P, Ainsworth BE, Li F. Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. J Sport Health Sci. 2020 Mar;9(2):103-104. doi: 10.1016/j.jshs.2020.02.001.

8- Burke E, McCarthy B. The lifestyle behaviours and exercise beliefs of undergraduate student nurses. Health Educ J. 2011; 111: 230-46. doi:10.1108/09654281111123501

9- Kim Y. Effect Factors on Health Promotion Lifestyle of Shift Work Nurses. Korean J Occup Health Nurs. 2011; 20: 356-64.https://doi.org/10.5807/kjohn.2011.20.3.356

10- Tomioka K, Iwamoto J, Saeki K, Okamoto N. Reliability and validity of the International Physical Activity Questionnaire (IPAQ) in elderly adults: the Fujiwara-kyo Study. J Epidemiol. 2011;21(6):459-65. doi: 10.2188/jea.je20110003.

11- Mäder U, Martin BW, Schutz Y, Marti B. Validity of four short physical activity questionnaires in middle-aged persons. Med Sci Sports Exerc. 2006;38(7):1255-66. doi: 10.1249/01.mss.0000227310.18902.28.

12- Hemed A, Taha N, Elwahab H, Mohamed E. Effect of educational program on nurses' performance regarding body mechanics. Zagazig Nursing Journal. 2017; 13(2):21-36.https://znj.journals.ekb.eg/article_38595_6b7ad6f3067034e5ef0059297d70b16d.pdf

13- Götte M, Seidel CC, Kesting SV, Rosenbaum D, Boos J. Objectively measured versus self-reported physical activity in children and adolescents with cancer. PLoS One. 2017 ;12(2):e0172216. doi: 10.1371/journal.pone.0172216.

14- Saridi M, Filippopoulou T, Tzitzikos G, Sarafis P, Souliotis K, Karakatsani D. Correlating physical activity and quality of life of healthcare workers. BMC Res Notes. 2019;12(1):208-14. doi: 10.1186/s13104-019-4240-1.

15- Chin DL, Nam S, Lee SJ. Occupational factors associated with obesity and leisure-time physical activity among nurses: A cross sectional study. Int J Nurs Stud. 2016;57:60-9. doi: 10.1016/j.ijnurstu.2016.01.009

16- Molina Aragonés JM, Sánchez San Cirilo S, Herreros López M, Vizcarro Sanagustín D, López Pérez C. Prevalencia de actividad física en profesionales de atención primaria de Cataluña [Prevalence of physical activity in primary health care workers of Catalonia]. Semergen. 2017 ;43(5):352-7. Spanish. doi: 10.1016/j.semerg.2016.04.026.

17- Bakhshi S, Sun F, Murrells T, While A. Nurses' health behaviours and physical activity-related health-promotion practices. Br J Community Nurs. 2015;(6):289-96. doi: 10.12968/bjcn.2015.20.6.289.

18- Al-Tannir MA, Kobrosly SY, Elbakri NK, Abu-Shaheen AK. Prevalence and predictors of physical exercise among nurses. A cross-sectional study. Saudi Med J. 2017;38(2):209-12. doi: 10.15537/smj.2017.2.15502.

19- Kua Z, Hamzah F, Tan PT, Ong LJ, Tan B, Huang Z. Physical activity levels and mental health burden of healthcare workers during COVID-19 lockdown. Stress Health. 2022;38(1):171-9. doi: 10.1002/smi.3078.

20- Jacob L, Tully MA, Barnett Y, Lopez-Sanchez GF, Butler L, Schuch F, et al. The relationship between physical activity and mental health in a sample of the UK public: A cross-sectional study during the implementation of COVID-19 social distancing measures. Ment Health Phys Act. 2020;19:100345. doi: 10.1016/j.mhpa.2020.100345.

21- Meyer J, McDowell C, Lansing J, Brower C, Smith L, Tully M, Herring M. Changes in Physical Activity and Sedentary Behavior in Response to COVID-19 and Their Associations with Mental Health in 3052 US Adults. Int J Environ Res Public Health. 2020;17(18):6469-82. doi: 10.3390/ijerph17186469.

22- Stults-Kolehmainen MA, Sinha R. The effects of stress on physical activity and exercise. Sports Med. 2014;44(1):81-121. doi: 10.1007/s40279-013-0090-5.

23- Melnyk BM, Hsieh AP, Tan A, Teall AM, Weberg D, Jun J, et al. Associations Among Nurses' Mental/Physical Health, Lifestyle Behaviors, Shift Length, and Workplace Wellness Support During COVID-19: Important Implications for Health Care Systems. Nurs Adm Q. 2022 01;46(1):5-18. doi: 10.1097/NAQ.0000000000000499.

24- Wilkerson A, Thomas H, Nahar V. Correlates of physical activity behaviour among nursing professionals: A systematic search and literature review. Journal of Health and Social Sciences .2019; 4(2):157-72 .10.19204/2019/crrl5

Alexithymia and its Link to Autism

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Abstract

Alexithymia is common, rather than universal, with notably high rates of overlap with autism spectrum disorder (ASD). Co-occurring autism and alexithymia represent a specific subgroup in the ASD population who may have specific clinical needs.

There is evidence of its overlap with ASD in terms of prevalence, etiology, and behaviors. Emerging evidence has found that alexithymia may also play a role as both cause and consequence of ASD in a feedforward cycle between alexithymia and ASD symptomatology.

Over the last two decades the association between alexithymia and autism spectrum disorder ASD has attracted significant attention – there has been a surge in the number of studies aimed at investigating the relationship between these conditions, including from a theoretical and etiological point of view, as well as for clinical and therapeutic practices. The ongoing studies and research aiming to understand how autism affects face perception need also to consider the contribution of alexithymia.

Here we review the description of Alexithymia and its relationship to ASD. Our first aim is to provide a brief definition then focus on the relationship between ASD and alexithymia, including clarifying when and how they originate, as well as their overlap in terms of etiology and features, and suggest clinically useful constructs and interventions.

Key words: Autism, ASD, Alexithymia, Emotions

Introduction

Alexithymia

Alexithymia was first described in 1972 by Sifneos and is rooted in the Greek, meaning ‘‘no words for emotion’’ (a = lack, lexis = word, thymos = mood or emotion). It was initially introduced into the vocabulary of psychiatry by Peter E. Sifneos in the early 1970s to characterize a number of patients with psychosomatic complaints (1) (2). There is no definite classification for diagnosis of Alexithymia in the psychiatric nosography. It is not officially recognized by the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) however, the diagnosis of Alexithymia depends on self-report made by a mental health professional (3).

Literally, Alexithymia indicates the lack of terms to express emotions and moods. It refers to difficulties in recognizing and distinguishing between different emotions and bodily sensations, difficulties in expressing emotions, a lack of imagination or fantasy life, and thoughts focused on external rather than internal experience (1). In fact, a common trait in these patients was their inability to verbalize their emotions, either due to their unawareness of the feelings that corresponded to these emotions or due to their confusion of emotional and bodily feelings (1)(2).

At its broadest level, alexithymia denotes both a cognitive and an affective deficit in the way some individuals recognize and communicate emotional states Cognitively, individuals with alexithymia use a concrete, practical style of thinking and affectively, they demonstrate a diminished, undifferentiated emotional awareness. The construct of alexithymia includes the following four main features:

(1) difficulty identifying and describing subjective feelings.
(2) trouble differentiating between feelings and the physical sensations of emotional arousal.
(3) limited imaginative processes.
(4) an externally oriented cognitive style (3).

Causes of Alexithymia and associated conditions:

Alexithymia causes isn’t well understood, and there’s a possibility it may be genetic. The condition may also be a result of brain damage to the insula. This part of the brain is known for its role in social skills, empathy, and emotions, with some studies linking insula lesions to apathy and anxiety (4) (5).

Additionally, this condition has been noted in people who have experienced trauma, especially during early childhood. Trauma and neglect at this stage may cause changes in the brain that can make it difficult to feel and identify emotions later in life (4) (5).

Alexithymia is implicated in a wide variety of psychological problems, such as depression (6) as well as schizophrenia (7). Research indicates that between 32 and 51 percent of people with depressive disorders also have alexithymia (4) (5).

Studies also indicate that this condition may be present in certain neurological diseases and injuries. These include:

- Alzheimer’s disease
- dystonia
- epilepsy
- Huntington’s disease
- multiple sclerosis
- Parkinson’s disease
- Stroke
- traumatic brain injury (4)(5)

On the other hand, emotional deficits in autism spectrum disorder may be largely driven by alexithymia (8).

Autism Spectrum Disorder

Throughout history, the typical characteristics of Autism disease were identified by Eugen Bleuler as early symptoms of schizophrenia, or by Melanie Klein as psychosis (9)(10). Since the early 1980s – and especially after the publication of the DSM-III (American Psychiatric Association [APA], 1980) – it has been recognized as an autonomous pathological condition definitively differentiated from schizophrenia. Eventually, descriptions of the condition were slightly modified and accurate criteria for its assessment were provided in 1987 by the DSM-III-R (American Psychiatric Association [APA], 1987). (11)(12).

The publication of the DSM-IV (American Psychiatric Association [APA], 1994) placed autism in the wider category of pervasive developmental disorders, a complex of syndromes that affect social interaction, communication and the capacity to develop varied interests. In this new conceptualization, a milder form of autism, Asperger’s syndrome, was distinguished, in which mental retardation and linguistic impairment are less severe.

In this view, the condition is characterized by the co-occurrence of various psychological disorders due to underlying neuropsychological and functional impairments (14)(16).

So what is the definition of Autism Spectrum Disorder?

According to the DSM-V (American Psychiatric Association [APA], 2013), Autism spectrum disorder (ASD) is a complex neurodevelopmental condition involving persistent challenges with social communication, restricted interests, and repetitive behavior. While autism is considered a lifelong disorder, the degree of impairment in functioning because of these challenges varies between individuals with autism (13)(14). ASD disorder can be noticed by parents/caregivers or pediatricians before a child reaches one year of age though, symptoms typically become more consistently observable by the time a child is 2 or 3 years old. In some cases, the functional impairment related to autism may be mild and not apparent until the child starts school, after which their deficits may be pronounced when amongst their peers (14)(16).

Social communication deficits may include: (15)
o Decreased sharing of interests with others
o Difficulty appreciating their own and others' emotions
o Aversion to maintaining eye contact
o Lack of proficiency with use of non-verbal gestures
o Stilted or scripted speech
o Interpreting abstract ideas literally
o Difficulty making friends or keeping them

Restricted interests and repetitive behaviors may include (15)
o Inflexibility of behavior, extreme difficulty coping with change
o Being overly focused on niche subjects to the exclusion of others
o Expecting others to be equally interested in those subjects
o Difficulty tolerating changes in routine and new experiences
o Sensory hypersensitivity, e.g., aversion to loud noises
o Stereotypical movements such as hand flapping, rocking, spinning
o Arranging things, often toys, in a very particular manner

ASD has also been associated with difficulties in emotion processing, in particular problems with recognizing emotions in others (17)(18).

Diagnosis of Alexithymia and Links to autism
Alexithymia is diagnosed in the range of neuropsychiatric disorders. There's no one single test for alexithymia, much like neurological disorders and mental illnesses in general. It can take time to receive the right diagnosis. Alexithymia is analyzed by a mental health professional who will likely ask questions and provide a diagnosis based on the answers. The measurement of alexithymia relies almost exclusively on self-report questionnaires that require participants to reflect on the difficulties they have in reflecting on their own emotions (19).

Another possible test is an MRI performed by a neurologist. This will provide images of the insula in the brain. A meta-analysis of neuroimaging studies suggests that alexithymia may be associated with reduced activation in a number of brain areas associated with emotion processing, specifically the amygdala, mirror neuron system related brain regions, the dorsomedial prefrontal cortex, and the right insula and precuneus (20).

On the other hand, the symptoms of autism spectrum disorder are wide-ranging, but there are still some stereotypes associated with Alexithymia. One major stereotype is a lack of empathy, something that has largely been shown up. Trait alexithymia is a subclinical phenomenon characterized by difficulties in recognizing, describing, and distinguishing feelings from the bodily sensations of emotional arousal (22). Many individuals show severe degrees of alexithymia without demonstrating autistic symptoms (40)(41). Although the incidence of alexithymia in the general population is thought to be only 10% (21) (23), studies suggest severe degrees of alexithymia in at least 50% of individuals with autism (24). Recent findings suggest that several other emotional deficits attributed to autism may instead be due to co-occurring alexithymia, including socio-emotional deficits in empathy (25) and attention to facial emotion (26)(42). There is good reason to speculate that co-occurring alexithymia may play an important role in understanding face perception deficits in individuals with ASC. Research suggests that alexithymia (independent of autism) is associated with impaired recognition of emotional expressions (27)(28)(42). For example, alexithymia has been shown to account for the difficulties many individuals with ASD experience in fixating the eye-region of faces and in recognizing facial, vocal and musical expressions of emotions (8) (25).

Empathic brain responses to the pain of others is predicted by alexithymia rather than ASD symptoms (25). Studies have shown, the degree of alexithymia, but not autism severity, predicted both anterior insula activity when individuals with autism empathize with the pain of other people and fixations to the eye and mouth area. In general population samples, alexithymia mediates the relationship between sub-clinical autistic traits and certain social reward and empathic processes (30). Consequently, it has been proposed that both autism and alexithymia may both be associated with a genetic vulnerability to atypical brain connectivity that can manifest as either "pure" autism, "pure" alexithymia, or co-occurring autism and alexithymia, depending on the exact networks affected (8).

Treatments
• To date, there isn't a single individual treatment for alexithymia. The exact treatment approach depends on overall health needs. For example, if a person has depression or anxiety, taking certain medications for these conditions could also help mental health symptoms (31)(32).
• While there is no "cure" for autism, there are several effective interventions that can improve a child's functioning. Therapies may be helpful for this condition which allow patients to participate in exercises to help improve mental health (31)(32).

Possible therapy options include:

Cognitive Behavioral Therapy (CBT) Applied behavioral analysis: It involves systematic study of the child's functional challenges, which is used to create a structured behavioral plan for improving their adaptive skills and decreasing inappropriate behavior:
o Social skills training: this intervention helps children with autism improve their ability to navigate social situations
o Speech & language therapy: It can improve the child's speech patterns and understanding of language to help them to express their feelings.
o Special education services: Under an Individual Education Plan provided by their school.
o Parent management training: Parents learn effective ways of responding to problematic behavior and

encouraging appropriate behavior in their child. Parent support groups help parents cope with the stressors of raising a child with autism.

o Treating co-occurring conditions: Children with autism experience insomnia, anxiety, and depression more often than peers without autism. They also more often have ADHD (16)(32)(33)(34).

Psychotherapy (also known as "talk therapy") (31)(32) and Medication:

A child psychiatrist can evaluate for co-morbid depression, anxiety, and impulsivity and if appropriate medications can be helpful. For example, autism-related irritability can be reduced by medications such as aripiprazole and risperidone (the two medications approved by the Food and Drug Administration for irritability associated with autism), prescribed judiciously by a knowledgeable clinician in collaboration with the child's parents (16)(32)(33)(34).

Alternative interventions and several complementary interventions involving special diets and supplements have been tried over the years by parents/caregivers seeking ways to help their child with autism function better. Yet, convincing evidence has not been found to clearly acclaim any specific intervention, . Research into these types of interventions continues (15).

Conclusion

Alexithymia is highly prevalent and plays an important and complex role in ASD, with approximately half of individuals with ASD estimated as having alexithymia, but the nature of its role remains elusive.

Despite their association, alexithymia and autism are fundamentally independent constructs. Alexithymia is neither necessary nor sufficient for an autism diagnosis, nor is it universal among autistic individuals. Alexithymia appears to be heightened although not universal, in the ASD population. This provides support for the alexithymia subgroup hypothesis of ASD, indicating that emotional processing difficulties traditionally associated with ASD are in fact rooted in co-occurring alexithymia, rather than representing a core feature of ASD itself

While not inherently dangerous, this condition may inadvertently lead to interpersonal and relationship issues. The good news is that there are therapies available that can help to improve mental health skills. Not only will this help with relationships with others, but more importantly, a patient may feel better, too. It's also important to keep in mind that negative emotions are just as important as positive ones. Learning how to identify these emotions and work with them (not against them) can help to lead a more fulfilling life.

References

1 -Sifneos, P. E. (1973). The prevalence of alexithymic characteristics in psychosomatic patients. Psychother. Psychosom. 22, 255–262. doi: 10.1159/000286529
CrossRef Full Text | Google Scholar

2-Sifneos, P. E. (2000). Alexithymia, clinical issues, politics and crime. Psychother. Psychosom. 69, 113–116. doi: 10.1159/000012377

3-((Emotional Processing Deficits and Happiness Assessing the Measurement, Correlates, and Well- Being of People with Alexithymia) *

4- Bamonti PM, et al. (2010). Association of alexithymia and depression symptom severity in adults 50 years of age and older.
ncbi.nlm.nih.gov/pmc/articles/PMC3071987/

5- Goerlich KS. (2018). The multifaceted nature of alexithymia—A neuroscientific perspective.
frontiersin.org/articles/10.3389/fpsyg.2018.01614/full

6-) Honkalampi, K., Hintikka, J., Tanskanen, A., Lehtonen, J., and Viinamäki, H. (2000). Depression is strongly associated with alexithymia in the general population. J. Psychosom. Res. 48, 99–104. doi: 10.1016/S0022-3999(99)00083-5

7- Rotenberg, V. S. (1994). An integrative psychophysiological approach to brain hemisphere functions in schizophrenia. Neurosci. Biobehav. Rev. 18, 487–495. doi: 10.1016/0149-7634(94)90003-5

8- . Bird, G., and Cook, R. (2013). Mixed emotions: the contribution of alexithymia to the emotional symptoms of autism. Transl. Psychiatry 3, e285. doi: 10.1038/tp.2013.

9- Wing, L. (1997). The history of ideas on Autism: legends, myths and reality. Autism 1, 13–23. doi: 10.1177/1362361397011004

10-Wolff, S. (2004). The history of Autism. Eur. Child. Adolesc. Psychiatry 13, 201–208. doi: 10.1007/s00787-004-0363-5

11- American Psychiatric Association [APA] (1980). Diagnostic and Statistical Manual of Mental Disorders (DSM-III), 3rd Edn. Washington, DC: APA Press.

12-American Psychiatric Association [APA] (1987). Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R), 3rd Edn. Washington, DC: APA Press.

13-(13) APA, Diagnostic and statistical manual of mental disorders 5 ed. 2013, American Psychiatric Publishing Arlington, VA.Google Scholar

14-. Emma Kinnaird, Catherine Stewart, Kate Tchanturia Investigating alexithymia in autism: A systematic review and meta-analysis. Eur Psychiatry. 2019 Jan; 55: 80–89. [PubMed] [Google Scholar]

15- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (DSM-5). Arlington, VA: American Psychiatric Association Publishing.

16- CDC. (2021, April 29). Autism Spectrum Disorder (ASD). Retrieved August 19, 2021, from: https://www.cdc.gov/ncbddd/autism/index.html

17- Guastella, AJ, Einfeld, SL, Gray, KM, Rinehart, NJ, Tonge, BJ, Lambert, TJ et al. Intranasal oxytocin improves emotion recognition for youth with autism Spectrum disorders. Biol Psychiatry 2010;67(7):692–4 http://dx.doi.org/10.1016/j.biopsych.2009.09.020.CrossRefGoogle ScholarPubMd
18-Silani, G, Bird, G, Brindley, R, Singer, T, Frith, C, Frith, U. Levels of emotional awareness and autism: an fMRI study. Soc Neurosci 2008;3(2):97
19- Vorst, HCM, Bermond, B. (2001). Validity and reliability of the Bermond–Vorst Alexithymia Questionnaire. Personality and Individual Differences 30: 413–434.
20- van der Velde J., Servaas M.N., Goerlich K.S., Bruggeman R., Horton P., Costafreda S.G. Neural correlates of alexithymia: a meta-analysis of emotion processing studies. Neurosci Biobehav Rev. 2013;37(7):1774–1785. [PubMed] [Google Scholar]
21- Linden, W., Wen, F., Paulus, D. L. (1995). Measuring alexithymia: Reliability, validity, and prevalence. In Butcher, J., Spielberger, C. (Eds.), Advances in personality assessment (pp. 51–95). Hillsdale, NJ: Erlbaum.
22- Nemiah, J. C., Freyberger, H., Sifneos, P. E. (1976). Alexithymia: A view of the psychosomatic process. In Hill, O. W. (Ed.), Modern trends in psychosomatic medicine (pp. 430–439). London, England: Butterworths.
Google Scholar
23- Salminen, J. K., Saarijärvi, S., Äärelä, E., Toikka, T., Kauhanen, J. (1999). Prevalence of alexithymia and its association with sociodemographic variables in the general population of Finland. Journal of Psychosomatic Research, 46, 75– 82.24- Berthoz, S., Hill, E. L. (2005). The validity of using self-reports to assess emotion regulation abilities in adults with autism spectrum disorder. European Psychiatry, 20, 291–298.
Google Scholar | Crossref | Medline | ISI
25- Bird, G., Silani, G., Brindley, R., White, S., Frith, U., Singer, T. (2010). Empathic brain responses in insula are modulated by levels of alexithymia but not autism. Brain, 133, 1515–1525.
Google Scholar | Crossref | Medline | ISI
26- Bird, G., Press, C., Richardson, D. C. (2011). The role of alexithymia in reduced eye-fixation in autism spectrum conditions. Journal of Autism and Developmental Disorders, 41, 1556–1564.
Google Scholar | Crossref | Medline | ISI
27- Jessimer, M., Markham, R. (1997). Alexithymia: A right hemisphere dysfunction specific to recognition of certain facial expressions? Brain and Cognition, 34, 246–258.
Google Scholar | Crossref | Medline | ISI
28- McDonald, P. W., Prkachin, K. M. (1990). The expression and perception of facial emotion in alexithymia: A pilot study. Psychosomatic Medicine, 52, 199–210.
Google Scholar | Crossref | Medline | ISI
29- Allen, R, Davis, R, Hill, E (2013) .The effects of autism and alexithymia on physiological and verbal responsiveness to music. Journal of Autism and Developmental Disorders 43: 432–444.,
30- Aaron, RG, Benson, TL, Park, S. (2015). Investigating the role of alexithymia on the empathic deficits found in schizotypy and autism spectrum traits. Personality and Individual Differences 77: 215–220.
31- Poquerusse J, et al. (2018). Alexithymia and autism spectrum disorder: A complex relationship.
ncbi.nlm.nih.gov/pmc/articles/PMC6056680/
32-Ricciardi L, et al. (2015). Alexithymia in neurological disease: A review. DOI:
doi.org/10.1176/appi.neuropsych.14070169.
33- Dietert, R.R, Dietert, J. C., Dewitt, J. C (2011). Environmental Risk Factors for Autism, Emerg. Heath Threats J., 2011, 4:10:3402/ehtj.v4i0.7111
34-Höfer, J., Hoffmann, F., & Bachmann, C. (2017). Use of complementary and alternative medicine in children and adolescents with autism spectrum disorder: A systematic review. Autism: The International Journal of Research and Practice, 21(4), 387–402.
35-Hyman, S. L., Levey, S. E., & Myers, S. M.. (2020). Council on Children with Disabilities, Section on Developmental and Behavioral Pediatrics.
36- Adolphs, R., Sears, L., Piven, J. (2001). Abnormal processing of social information from faces in autism. Journal of Cognitive Neuroscience, 13, 232–240.
Google Scholar | Crossref | Medline | ISI
37- Ashwin, C., Chapman, E., Colle, L., Baron-Cohen, S. (2006). Impaired recognition of negative basic emotions in autism: A test of the amygdala theory. Social Neuroscience, 1, 349–363.
Google Scholar | Crossref | Medline | ISI
38- Bagby, R. M., Taylor, G. J., Parker, J. D. (1994). The twenty-item Toronto Alexithymia Scale—II. Convergent, discriminant, and concurrent validity. Journal of Psychosomatic Research, 38, 33–40.
Google Scholar | Crossref | Medline | ISI
39- Calder, A. J., Young, A. W. (2005). Understanding the recognition of facial identity and facial expression. Nature Reviews Neuroscience, 6, 641–651.
Google Scholar | Crossref | Medline | ISI
40- Lane, R. D., Sechrest, L., Reidel, R., Weldon, V., Kaszniak, A., Schwartz, G. E. (1996). Impaired verbal and nonverbal emotion recognition in alexithymia. Psychosomatic Medicine, 58, 203–210.
Google Scholar | Crossref | Medline | ISI
41- Riby, D. M., Doherty-Sneddon, G., Bruce, V. (2009). The eyes or the mouth? Feature salience and unfamiliar face processing in Williams syndrome and autism. Quarterly Journal of Experimental Psychology, 62, 189–203.
Google Scholar | Crossref | Medline | ISI
42- Weigelt, S., Koldewyn, K., Kanwisher, N. (2012). Face identity recognition in autism spectrum disorders: A review of behavioral studies. Neuroscience & Biobehavioral Reviews, 36, 1060–1084.
Google Scholar | Crossref | Medline | ISI

Nocturnal Enuresis

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Abstract

Nocturnal enuresis, or involuntary urination, is a common problem among children. It affects approximately 15% of all children at 5 years old. At our workplace as a primary health care facility, nocturnal enuresis, and incontinence in general, is one of the most common chief complaints presenting to the clinic.

Enuresis can be disruptive to normal family life and can generate stress between parents and child. There may be anxiety about events like sleepovers and campouts and there are significant costs in lost time, laundary and bedding, as well as the potential for guilt and loss of self-esteem.

Nocturnal enuresis decreases with age, with a spontaneous remission rate of about 15% per year. It can improve with treatment, and improved self-esteem and quality of life have been reported after successful treatment. It is therefore important to offer timely treatment, and to refer children for specialist care when treatments are not effective.

In this review we discuss definition, epidemiology, etiology, evaluation and different modalities of treatment for nocturnal enuresis .

Key words: Nocturnal enuresis, alarm, desmopressin .

Definition

Nocturnal enuresis refers to the involuntary loss of urine during sleep that occurs at least twice a week in children older than 5 years of age for at least 3 months, and it is the most common urologic complaint in pediatric patients [1][2]. To avoid confusion, the International Children's Continence Society has defined enuresis as wetting that occurs at night, whereas they no longer refer to daytime incontinence as diurnal enuresis [2].

Nocturnal enuresis is classified into primary enuresis and secondary enuresis. Primary enuresis is when it occurs in a child who has not been dry for at least 6 months, whereas secondary enuresis is the one that has an onset after a period of nocturnal dryness of at least 6 months [2][3]. Also, the enuresis is classified as monosymptomatic or non-monosymptomatic, with the latter correlating with daytime incontinence or other lower urinary tract symptoms like urgency[5].

According to the International Children's Continence Society (ICCS), two main groups can be distinguished for intermittent incontinence: nocturnal enuresis, and functional daytime urinary incontinence [6].

Epidemiology

Nocturnal incontinence occurs in 12% to 25% of 4-year-old children, 7% to 10% of 8-year-old children, and 2% to 3% of 12-year-old children [7]. Enuresis is more common in boys when compared to girls, with a ratio of 3 to 1, but this difference tends to decrease after age of 10[3][5].

Etiology

Enuresis is a complex condition to which genetic, physiological, and psychological factors contribute. Some patients have a definite cause of enuresis or urinary incontinence, like neurogenic bladder, detrusor overactivity, vaginal reflux, or stress incontinence [8][9].

Factors that are believed to contribute to enuresis include:

Genetics: there is a strong association with parental history of childhood enuresis. The overall odds ratio of having nocturnal enuresis and urinary incontinence was 10.1 times higher if the father or mother also had a history of nocturnal enuresis or urinary incontinence [10][11].

Defective sleep arousal: In most children with enuresis the arousal response is defective during sleep. When urine volume exceeds bladder capacity, bedwetting occurs[12]. Although arousability is reduced, the sleep architecture itself is usually unaltered, and enuresis occurs in all sleep stages, particularly during non-REM (rapid eye movement) sleep [13].

Nocturnal polyuria: According to case-control studies, many children with nocturnal enuresis have an altered diurnal rhythm of vasopressin secretion [14,15], resulting in the production of excessive amounts of relatively dilute urine overnight. The expected bladder capacity is calculated by the formula: (age in years +1)×30 mL, which is valid from 2 to 12 years. Nocturnal polyuria is defined as greater than 130% of the expected bladder capacity for age.

Bladder factors: In children with nocturnal enuresis, the emptying reflexes of the full bladder are not adequately inhibited during sleep, resulting in involuntary voiding[16]. The pontine micturition centre of the brain stem is involved in this process.

Psychiatric disorders in children with enuresis are higher than the rate found in the non-enuretic groups but the relationship may be of etiologic relevance or it may be coincidental or occurring in response to the symptom of enuresis [17] . Children with enuresis had 2.88 times increased odds (95%CI: 1.26-6.57) of having attention deficit hyperactivity disorder (ADHD) as compared with those without enuresis [18]. It has been suggested that both enuresis and ADHD might be related to delays in central nervous system maturation [19].

Evaluation

Evaluation of a child with enuresis consists of detailed history, focused examination and appropriate investigations.

A careful history should be obtained and a thorough physical examination should be performed. Careful questioning of parents and children can be extremely helpful in determining the type of enuresis and a possible cause or contributing factors.

Parents often are not fully aware of their child's daily voiding habits. Thus, a voiding diary may need to be maintained for a week or more. The family should keep track of how many times the child voids during the day and how many nights the child wets the bed. Key questions should include periods of dryness, stress in family, family history of enuresis, bowel control, peer interactions and emotional changes. Never forget to ask about urinary infection symptoms (frequency, volume, stream, retention, urgency, and dysuria); also enquire about age and results of previous therapy and other health problems and medications. Voiding history questionnaires are useful and may be obtained from the National Kidney Foundation on The World Wide Web [20].

A history of snoring, mouth breathing, behavioral problems and daytime somnolence in patients with enlarged tonsils or adenoids may suggest obstructive sleep apnea. Surgical correction of airway obstruction in these patients improves or cures nocturnal enuresis and daytime wetting [21].

The physical examination is often unrevealing but helps to exclude less common anatomic or neurologic problems. A full physical examination is required for each child, especially for the abdomen, spine, anal and genital regions, and the lower extremities [22].

Investigations :
Investigations are usually minimally required in children with monosymptomatic nocturnal enuresis.

Urinalysis: Urinalysis should be performed in all children with monosymptomatic enuresis [23].

Imaging for selected patients: Urologic imaging (renal sonogram and voiding cystourethrogram) is reserved for children who have significant daytime complaints, a history of UTI(s) not previously evaluated, and/or signs and symptoms of structural urologic abnormalities [23,24]. Abdominal radiograph although rarely used for determining the presence and/or extent of stool retention is also helpful in convincing the parents about the severity of the constipation [25].

Treatment

Nocturnal enuresis is considered normal at least till 5 years. Even subsequently need for intervention is often not a medical decision being influenced primarily by the family and the child's perception towards enuresis. **Education:** The first step in treating primary nocturnal enuresis is to educate the child and parents about the condition and provide reassurance regarding spontaneous resolution (annual cure rate is 15%) [26,27].

Motivational therapy: includes reassurance, emotional support, eliminating guilt, and encouraging the child to take responsibility for the enuresis [28].

Avoid ineffective and even potentially harmful strategies, such as fluid restriction, retention control training (encouraging the child not to void for as long as possible to expand bladder capacity), and unnecessary drugs. Rewarding agreed behaviour (such as drinking adequately, voiding before sleep, and engaging in management) may be more effective than rewarding dry nights, which are out of the child's conscious control [19]. Although simple behavioral therapies are superior to no active treatment, they are inferior to confirmed effective treatments [29].

Bed-Wetting Alarm

The concept of using an alarm that emits a sound when a child wets the bed was first introduced in 1938[30]. The bed-wetting alarm has been shown to be the most effective treatment for nocturnal enuresis [31]. Compared with other skill-based or pharmacologic treatments, the bed-wetting alarm has a higher success rate (75 percent) and a lower relapse rate (41 percent) [32]. For resolution of nocturnal enuresis, the bed-wetting alarm may need to be used for up to 15 weeks.

Improved technology has made the bed-wetting alarm a more attractive option than in the past. Alarms are now smaller and lighter, and they can be equipped with a buzzer, rather than a sound alarm, for children who do not respond to an alarm sound or for households in which an alarm disrupts the sleep of others.

Disadvantages include the need for active parental participation to help wake the child (a major factor in failure). The potential inability of the alarm to awaken the child or parents, and the presence of external hardware. Relapse rates average 42 % (range 4%-55%) [33][34].

Pharmacotherapy :

Medication should be initiated in children seven years and older only if nonpharmacologic measures fail. Children who do not respond to one or more measures may benefit from combined treatment strategies (e.g., combining nonpharmacologic and pharmacologic treatment or multiple pharmacologic therapies).

Two medications, Desmopressin and imipramine have proven efficacy in the treatment of enuresis.

Desmopressin (DDAVP) is a synthetic ADH, and in tablet or nasal form.

About 30 to 60 minutes before falling asleep, tablets of 0.2–0.4 mg, or melt tablets of 120–240 µg, are administered orally. Because of the rare adverse effect of water intoxication, the fluid intake should not exceed 250 mL afterwards. If the child does not attain dryness after four weeks, the medication should be discontinued. If the effects are positive, desmopressin can be taken for three months (after which an attempt at withdrawal should be made without tapering doses). With desmopressin, about 30% of children attain complete dryness, and 40% partial dryness; however, the relapse rate is about 50% [35].

In a systematic review of 47 trials, desmopressin (standard dose) had some effect during treatment in about 70% of children. Most experienced a reduction in the amount and frequency (by one to two nights/week) of bedwetting compared with placebo (weighted mean difference (WMD) −1.33, −1.67 to −0.99), although less than half became completely dry (relative risk for failure 0.81, 0.74 to 0.88) [36].

Imipramine: Imipramine is approved for use in treating nocturnal enuresis in children aged 6 years and above. A systematic review of 58 trials showed that imipramine and other tricyclic antidepressants can be effective, 49 with a reduction in the frequency of bedwetting by one night per week compared with placebo (WMD −0.92, −1.38 to −0.46). About a fifth of the children became dry while on treatment (relative risk for failure 0.77, 0.72 to 0.83). This effect was not sustained after treatment stopped, with no difference between tricyclics and placebo (relative risk 0.98, 0.95 to 1.03) [37].

Other Approaches :

Various nonpharmacologic treatments have been shown to have a positive effect on bed-wetting in small studies but have not been extensively evaluated (generally weak strength of evidence). These approaches include an elimination diet [38], hypnosis [38], retention control (i.e., holding urine for progressively longer periods) [39], biofeedback [40], acupuncture [41], scheduled awakenings [42] and caffeine restriction [43].

Referral: Further assess or refer children with nocturnal enuresis if they have severe daytime symptoms, a history of recurrent urinary tract infections, abnormal renal ultrasound results, known or suspected physical or neurological problems, comorbid conditions (such as fecal incontinence; diabetes; and attention, learning, behavioural, or emotional problems), or family problems. Also refer those who have not responded to treatment after six months [44].

Conclusion

Nocturnal enuresis is a disorder in which episodes of urinary incontinence occur during sleep in children ≥5 years of age. Enuresis can be categorized into monosymptomatic (MEN) and nonmonosymptomatic (NMEN) forms. MEN occurs without any other symptoms of bladder dysfunction. NMEN is associated with dysfunction of the lower urinary tract with or without daytime incontinence.

Genetic, physiological, and psychological factors contribute to the etiology of nocturnal enuresis.

A careful clinical history is fundamental to the evaluation of enuresis. Diagnostic procedures include medical history and psychological screening with questionnaires, bladder and bowel diary, physical examination and urinalysis. Imaging and urodynamic studies generally are not needed unless specifically indicated. Treatment must involve both the child and family and take into consideration the possible pathophysiological mechanisms. A behavior modification program is the treatment of choice, including alarm, positive reinforcement, charting of progress to increase confidence and self-esteem and avoiding psychological trauma through blame or punishing the child.

Alarm therapy remains the first-line treatment modality for nocturnal enuresis. Desmopressin is the most commonly used medical treatment. It is the choice of treatment where alarm therapy is not available, or in addition to alarm therapy if that has failed when used alone.

The most important message for children are : it is not your fault, you are not alone it will get better.

References

1. Proserpio P, Terzaghi M, Manni R, Nobili L. Drugs Used in Parasomnia. Sleep Med Clin. 2018 Jun;13(2):191-202. [PubMed]
2. Graham KM, Levy JB. Enuresis. Pediatr Rev. 2009 May;30(5):165-72; quiz 173. [PubMed]
3. Thurber S. Childhood Enuresis: Current Diagnostic Formulations, Salient Findings, and Effective Treatment Modalities. Arch Psychiatr Nurs. 2017 Jun;31(3):319-323. [PubMed]
4. Tsai JD, Chen HJ, Ku MS, Chen SM, Hsu CC, Tung MC, Lin CC, Chang HY, Sheu JN. Association between allergic disease, sleep-disordered breathing, and childhood nocturnal enuresis: a population-based case-control study. Pediatr Nephrol. 2017 Dec;32(12):2293-2301. [PubMed]
5. Dossche L, Walle JV, Van Herzeele C. The pathophysiology of monosymptomatic nocturnal enuresis with special emphasis on the circadian rhythm of renal physiology. Eur J Pediatr. 2016 Jun;175(6):747-54. [PubMed]
6. Nevéus, Tryggve, et al. "The standardization of terminology of lower urinary tract function in children and adolescents: report from the Standardisation Committee of the International Children's Continence Society." The Journal of urology 176.1 (2006): 314-324.Spee-van der Wekke J, Hirasing RA, Meulmeester JF, Radder JJ. Childhood nocturnal enuresis in The Netherlands. Urology 1998; 51: 1022-1026 [PMID: 9609644 DOI: 10.1016/S0090- 4295(98)00106-X]
7. Chan, Ivy HY, and Kenneth KY Wong. "Common urological problems in children: primary nocturnal enuresis." Hong Kong Medical Journal 25.4 (2019): 305.
8. von Gontard, A., Mauer-Mucke, K., Plück, J., Berner, W., & Lehmkuhl, G. (1999). Clinical behavioral problems in day-and night-wetting children. Pediatric Nephrology, 13(8), 662-667.
9. Eiberg, H., Berendt, I., & Mohr, J. (1995). Assignment of dominant inherited nocturnal enuresis (ENUR1) to chromosome 13q. Nature genetics, 10(3), 354-356.
10. Arnell, H., Hjälmås, K., Jägervall, M., Läckgren, G., Stenberg, A., Bengtsson, B., ... & Dahl, N. (1997). The genetics of primary nocturnal enuresis: inheritance and suggestion of a second major gene on chromosome 12q. Journal of medical genetics, 34(5), 360-365.
11. Wolfish, N. M., Pivik, R. T., & Busby, K. A. (1997). Elevated sleep arousal thresholds in enuretic boys: clinical implications. Acta paediatrica, 86(4), 381-384.
12. Yeung, C. K., Diao, M., & Sreedhar, B. (2008). Cortical arousal in children with severe enuresis. New England Journal of Medicine, 358(22), 2414-2415.
13. Rasmussen, P. V., Kirk, J., Borup, K., Nørgaard, J. P., & Djurhuus, J. C. (1996). Enuresis nocturna can be provoked in normal healthy children by increasing the nocturnal urine output. Scandinavian journal of urology and nephrology, 30(1), 57-61.
14. Rittig, S., Knudsen, U. B., Norgaard, J. P., Pedersen, E. B., & Djurhuus, J. C. (1989). Abnormal diurnal rhythm of plasma vasopressin and urinary output in patients with enuresis. American Journal of Physiology-Renal Physiology, 256(4), F664-F671.
15. Koff, S. A. (1996). Cure of nocturnal enuresis: why isn't desmopressin very effective?. Pediatric Nephrology, 10(5), 667-670.
16. Sureshkumar, P., Jones, M., Caldwell, P. H., & Craig, J. C. (2009). Risk factors for nocturnal enuresis in school-age children. The Journal of urology, 182(6), 2893-2899.
17. Fehlow, P. (1985). EEG findings in 130 enuretics with special reference to spike potentials. Psychiatrie, Neurologie, und Medizinische Psychologie, 37(4), 221-227.
18. Oppel, W. C., Harper, P. A., & Rider, R. V. (1968). The age of attaining bladder control. Pediatrics, 42(4), 614-626.
19. . https://www.kidney.org/sites/default/files/docs/voidhist.pdf .

20. Firoozi, F., Batniji, R., Aslan, A. R., Longhurst, P. A., & Kogan, B. A. (2006). Resolution of diurnal incontinence and nocturnal enuresis after adenotonsillectomy in children. The journal of urology, 175(5), 1885-1888.
21. von Gontard, A., & Kuwertz-Bröking, E. (2019). The diagnosis and treatment of enuresis and functional daytime urinary incontinence. Deutsches Ärzteblatt International, 116(16), 279.
22. Neveus, T., Eggert, P., Evans, J., Macedo, A., Rittig, S., Tekgül, S., ... & Robson, L. (2010). Evaluation of and treatment for monosymptomatic enuresis: a standardization document from the International Children's Continence Society. The Journal of urology, 183(2), 441-447.
23. Robson, W. L. M. (2009). Evaluation and management of enuresis. New England Journal of Medicine, 360(14), 1429-1436.
24. Cohen-Zrubavel, V., Kushnir, B., Kushnir, J., & Sadeh, A. (2011). Sleep and sleepiness in children with nocturnal enuresis. Sleep, 34(2), 191-194.
25. Ramakrishnan, K. (2008). Evaluation and treatment of enuresis. American family physician, 78(4), 489-496.
26. Rakowska-Silska, M., Jobs, K., Paturej, A., & Kalicki, B. (2020). Voiding disorders in pediatrician's practice. Clinical Medicine Insights: Pediatrics, 14, 1179556520975035.
27. Cendron, M. (1999). Primary nocturnal enuresis: current. American family physician, 59(5), 1205.
28. Caldwell, P. H., Nankivell, G., & Sureshkumar, P. (2013). Simple behavioural interventions for nocturnal enuresis in children. Cochrane Database of Systematic Reviews, (7)..
29. Kristensen, I. N. J. G. (1999). Alarm treatment: analyses of response and relapse. Scandinavian Journal of Urology and Nephrology, 33(202), 73-75.
30. Friman, P. C. (1995). Nocturnal enuresis in the child. Principles and practice of sleep medicine in the child. Philadelphia: WB Saunders, 107-13.
31. Läckgren, G., Hjalmås, K., Gool, J. V., Gontard, A. V., Gennaro, M. D., Lottmann, H., & Terho, P. (1999). COMMITTEE REPORT: Nocturnal enuresis: a suggestion for a European treatment strategy. Acta paediatrica, 88(6), 679-690.
32. Butler, R. J., & Robinson, J. C. (2002). Alarm treatment for childhood nocturnal enuresis: an investigation of within-treatment variables. Scandinavian journal of urology and nephrology, 36(4), 268-272.
33. Glazener, C. M., Evans, J. H., & Peto, R. E. (2005). Alarm interventions for nocturnal enuresis in children. Cochrane Database of Systematic Reviews, (2).
34. Jalkut MW, Lerman SE, Churchill BM. Enuresis. Pediatr Clin North Am. 2001;48:1461–88.
35. Glazener, C. M., & Evans, J. H. (2002). Desmopressin for nocturnal enuresis in children. Cochrane Database of Systematic Reviews, (3).
36. Glazener, C. M., Evans, J. H., & Peto, R. E. (2003). Tricyclic and related drugs for nocturnal enuresis in children. Cochrane Database of Systematic Reviews, (3).
37. Miller, K. (1993). Concomitant nonpharmacologic therapy in the treatment of primary nocturnal enuresis. Clinical pediatrics, 32(1_suppl), 32-37.
38. Monda, J. M., & Husmann, D. A. (1995). Primary nocturnal enuresis: a comparison among observation, imipramine, desmopressin acetate and bed-wetting alarm systems. The Journal of urology, 154(2), 745-748.
39. McKENNA, P. H., HERNDON, C. A., CONNERY, S., & FERRER, F. A. (1999). Pelvic floor muscle retraining for pediatric voiding dysfunction using interactive computer games. The Journal of urology, 162(3 Part 2), 1056-1062..
40. Björkström, G., Hellström, A. L., & Andersson, S. (2000). Electro-acupuncture in the treatment of children with monosymptomatic nocturnal enuresis. Scandinavian journal of urology and nephrology, 34(1), 21-26.
41. Creer, T. L., & Davis, M. H. (1975). Using a staggered-wakening procedure with enuretic children in an institutional setting. Journal of Behavior Therapy and Experimental Psychiatry, 6(1), 23-25.
42. Jalkut MW, Lerman SE, Churchill BM. Enuresis. Pediatr Clin North Am. 2001;48:1461–88.
43. UK, N. C. G. C. (2010). Nocturnal enuresis: The management of bedwetting in children and young people.

The diagnosis and treatment of Bell's palsy

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Abstract

Bell's palsy is an idiopathic peripheral nerve disorder involving the facial nerve. It is of rapid onset, and almost always unilateral. It is the most common diagnosis associated with facial nerve palsy. It has been described in patients of all ages, but the incidence is slightly higher after age 40.

Methods: Using internet search, a comprehensive literature review was done and words such as facial nerve palsy, Bell's palsy were searched.

Results: In confirmed Bell's palsy, unless contraindicated, corticosteroids should be given to all patients with Bell's palsy as early as possible, (ideally within 72 hours). Combination therapy with steroids and antiviral agents are recommended for patients with severe to complete paresis. Patients with incomplete eye closure should be given eye protection, with lubricating drops and ointments, to prevent corneal damage.

Conclusion:Establishing the correct diagnosis is imperative to avoid missing another treatable condition. Determining whether the facial nerve paralysis is central or peripheral is important. The history of a Bell's palsy case should include discomfort or sensory symptoms in the distribution of the facial nerve in the hours or days preceding facial palsy, and it is very important to reveal whether the symptoms were progressive in nature.

Although many patients with Bell palsy will experience improvement in their facial nerve function without treatment, persistent facial weakness can have implications for quality of life. Choosing the correct treatment options for suitable patients can optimize the likelihood of recovery. Oral steroids should be prescribed within 72 hours of symptoms onset for Bell's palsy patients. Combined steroid and antiviral treatment are recommended for patients with severe to complete paresis. Physiotherapy may be suggested in severe Bell's palsy. Surgical decompression is not recommended and may be considered in severe facial nerve degeneration on electroneuronography if the patient is willing to accept the surgical risks. Eye protection remains crucial in preventing long-term eye complications. Clinical and ophthalmological follow-up, and referral to a specialist for patients with no improvement or progressive weakness are recommended.

Key words: Facial nerve palsy, Bell's palsy, Glucocorticoids, Antiviral.

Introduction

Bell's palsy is an idiopathic peripheral nerve disorder involving the facial nerve. It is named after Sir Charles Bell, who in 1821 first described the anatomy of the facial nerve (1). It is the most common diagnosis associated with facial nerve weakness/paralysis (2). The annual incidence of Bell's palsy ranges from 11 to 53.3 per 100,000 persons (3,4). with no predilection for sex or ethnicity. It has been described in patients of all ages, but the incidence is slightly higher after age 40 (4,5). Risk factors include diabetes, pregnancy, severe preeclampsia, obesity, and hypertension (6-9). Patients who have had one episode of Bell's palsy have an 8 percent risk of recurrence (5).

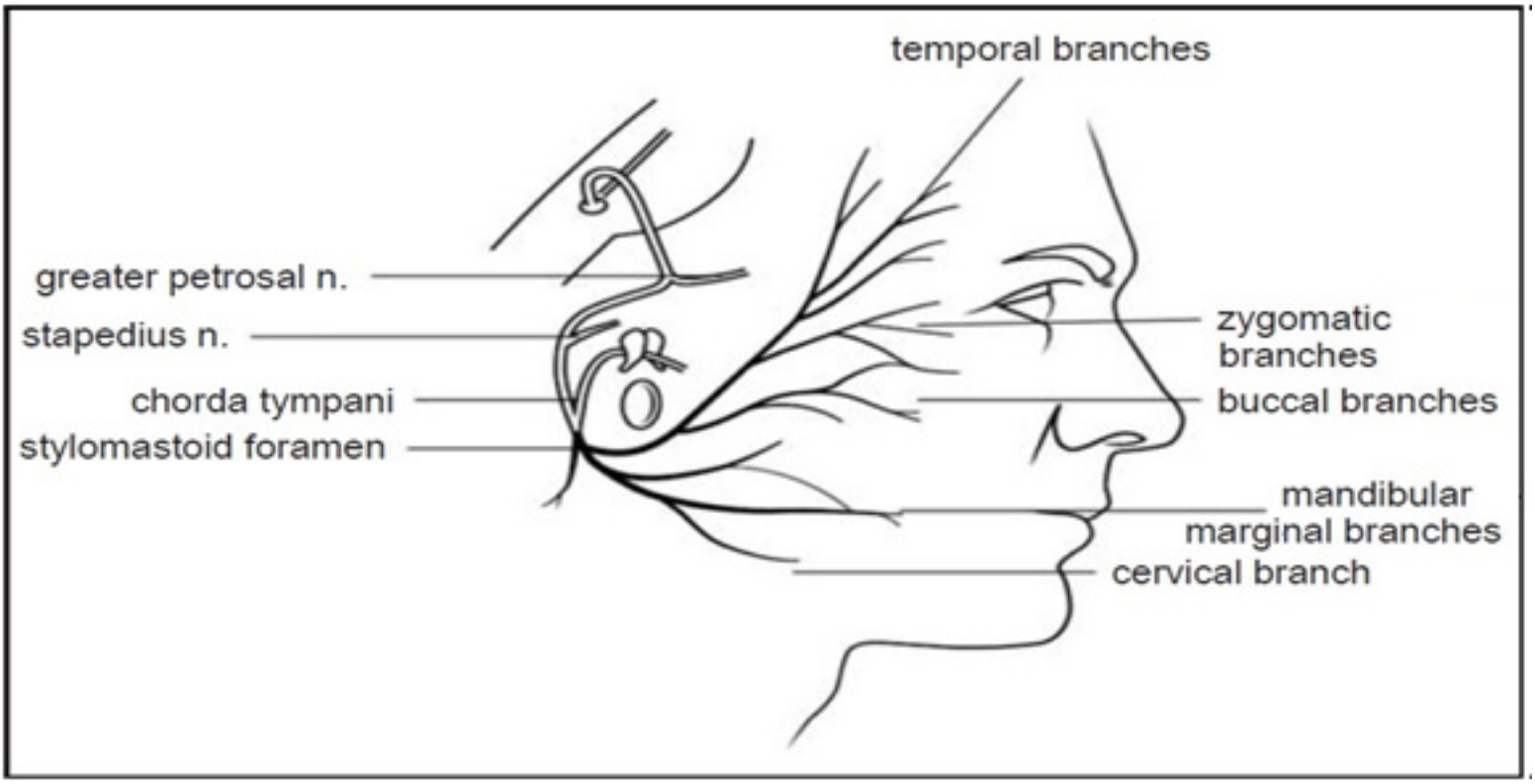
Anatomy

The facial nerve is composed of motor fibers (innervating the muscles of facial expression, posterior belly of digastric, stylohyoid and stapedius), parasympathetic fibers (innervating the lacrimal, submandibular, and sublingual salivary glands), somatic afferents (from the external ear) and afferent taste fibers from the anterior two thirds of the tongue. The facial nerve (motor root) exits the brainstem at the lower aspect of the pons in the cerebellopontine angle and the nervus intermedius (sensory and parasympathetic secretomotor fibers) and emerges between the pons and the inferior cerebellar peduncle. Both parts of the nerve pass into the internal auditory meatus in the petrous temporal bone, travelling with the VIII nerve until they enter the facial canal. The genu of the facial nerve describes a sharp bend over the promontory of the middle ear where the secretomotor fibers for the lacrimal gland leave via the greater petrosal nerve, and the facial nerve travels inferiorly, in the medial wall of the middle ear cavity. Within the facial canal, the nerve to stapedius and chorda tympani are also given off before the facial nerve enters the stylomastoid foramen. The chorda tympani nerve runs between incus and malleus in the middle ear, entering the infratemporal fossa to join the lingual nerve, carrying taste fibers from the anterior tongue and secretomotor fibers to the submandibular ganglion, supplying the submandibular and sublingual salivary glands (10,11).

The facial nerve has five terminal branches that innervate the muscles of facial expression:

- The temporal branch (muscles of the forehead and superior part of the orbicularis oculi)
- The zygomatic branch (muscles of the nasolabial fold and cheek, eg, nasalis and zygomaticus).
- The buccal branch (the buccinators and inferior part of the orbicularis oculi)
- The marginal mandibular branch (the depressors of the mouth, eg, depressor anguli and mentalis)
- The cervical branch (the platysma muscle). Figure 1

Figure 1: Courses and branches of the facial nerve. The intracranial course is shown as transparent (12).



Clinical characteristics

Clinical features of Bell's palsy include ipsilateral weakness or paralysis of the upper and lower facial muscles of the affected side, drooping of eyelids of the same side, incomplete closure of eye that causes drying of eye, the eye rolls upward (Bell's phenomenon) on attempted closure, epiphora, drooping of the corner of the mouth, altered gustatory sensation on the same side, food and saliva can pool in the affected side of the mouth and may spill out from the corner, altered sensation on the affected side of the face, hyperacusis (sensitivity to sound increases). About 70% of patients have associated ipsilateral pain around the ear. Patients with Bell's palsy usually progress from onset of symptoms to maximal weakness within three days and almost always within one week (2,13). (Figure 2).

The severity of facial nerve palsy is usually rated on the six-point House and Brackmann scale, with grade I corresponding to normal facial nerve function and grade VI corresponding to total paralysis (Table 1) (14). Further rating scales (the Sunnybrook Facial Grading System (FGS) scale) (15) and video documentation are used mainly for follow up of residual weakness and after facial nerve reanimation surgery (16).

Figure 2: Bell's palsy on the left side of the face (17)

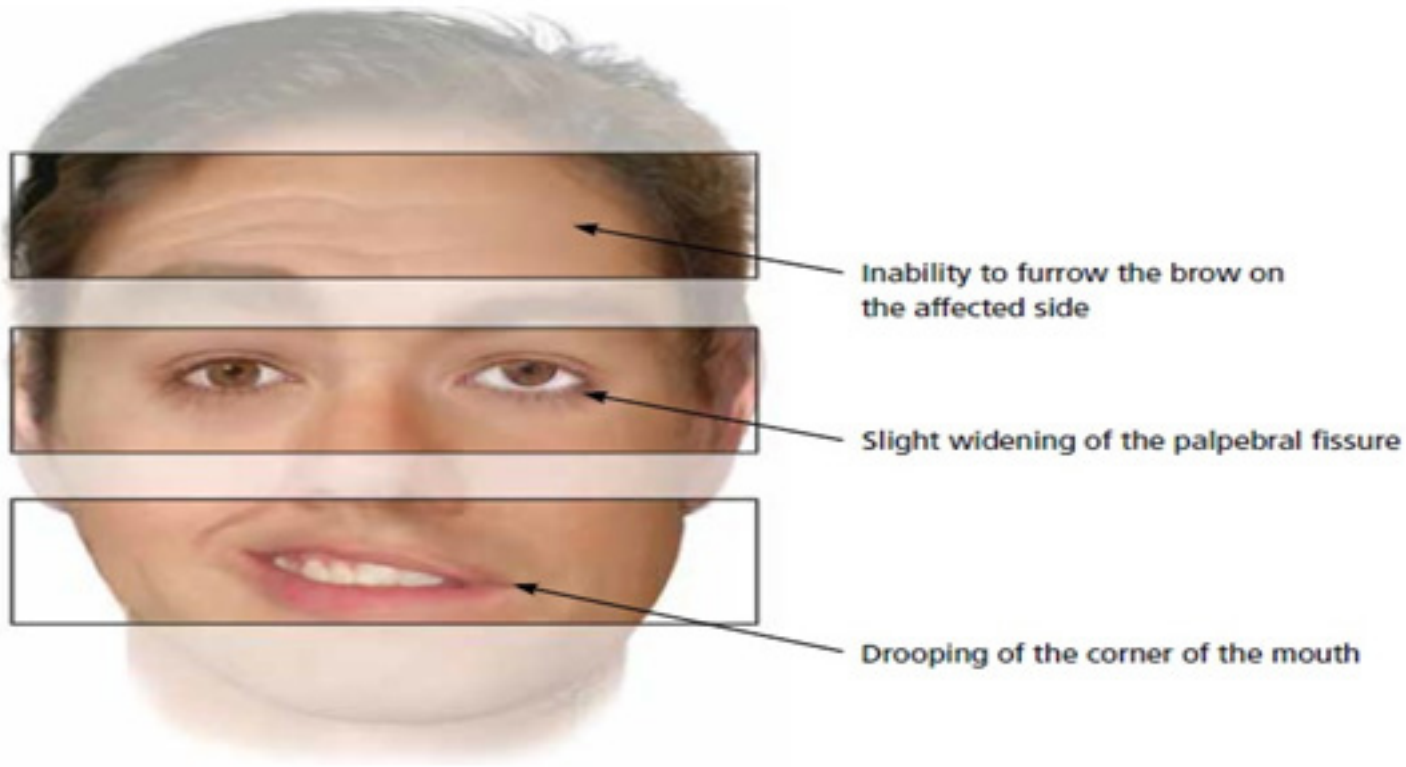


Table 1: House-Brackmann facial nerve grading system

Grade	Description	Findings
I	Normal	Normal facial function in all areas.
II	Mild dysfunction	Slight weakness noticeable only on close inspection. At rest: normal symmetry of forehead, ability to close eye with minimal effort and slight asymmetry, ability to move corners of mouth with maximal effort and slight asymmetry. No synkinesis, contracture, or hemifacial spasm.
III	Moderate dysfunction	Obvious, but not disfiguring difference between two sides, no functional impairment. noticeable but not severe synkinesis, contracture, and/or hemifacial spasm. At rest: normal symmetry and tone. Motion: slight to no movement of forehead, ability to close eye with maximal effort and obvious asymmetry, ability to move corners of mouth with maximal effort and obvious asymmetry. Patients who have obvious but no disfiguring synkinesis, contracture, and/or hemifacial spasm are grade III regardless of degree of motor activity.
IV	Moderately severe dysfunction	Obvious weakness and/or disfiguring asymmetry. At rest: normal symmetry and tone. Motion: no movement of forehead; inability to close eye completely with maximal effort. Patients with synkinesis, mass action, and/or hemifacial spasm severe enough to interfere with function are grade IV regardless of motor activity.
V	Severe dysfunction	Only barely perceptible motion. At rest: possible asymmetry with droop of corner of mouth and decreased or absence of nasal labial fold. Motion: no movement of forehead, incomplete closure of eye and only slight movement of lid with maximal effort, slight movement of corner of mouth. Synkinesis, contracture, and hemifacial spasm usually absent.
VI	Total paralysis	Loss of tone; asymmetry; no motion; no synkinesis, contracture, or hemifacial spasm.

Etiology

Despite its idiopathic status, several theories on the underlying etiology of Bell's palsy have been proposed, including viral reactivation, such as the varicella zoster virus (VZV) (18), herpes simplex virus type 1 (HSV-1) (19), and human herpes virus 6 (20). Isolated facial paralysis after vaccination has been reported with almost all viral vaccines, and it is thought to be immune mediated or induced by viral reactivations (eg, reactivation of a herpes virus infection) (21). However, studies have failed to identify a higher risk of facial paralysis after vaccination (21,22).

Other theories suggested that Bell's palsy results from ischemia (23,24), and inflammation of the facial nerve (A high neutrophil-to-lymphocyte ratio (NLR) (25,26) and decreased percentages of total T cells (CD3) and T helper/inducing cells (CD4) have been found in patients with Bell's palsy (27)). And several studies found a correlation between the cold season and the number of Bell's palsy cases (28-30).

Recently, there is ongoing public concern regarding the possible adverse effects of SARS-CoV-2 immunization. Two clinical trials of these vaccines reported seven cases of Bell's palsy in the vaccinated group. The US Food and Drug Administration (FDA) did not consider there to be a clear basis on which to conclude a causal relationship. Therefore, the FDA recommended further surveillance of these vaccines as they have been authorized for widespread emergency use (31,32). One letter reported that the observed incidence of Bell's palsy in the mRNA vaccine groups was 1.5 - 3 times higher than would be expected in the general population (33). Other research

Table 2: Etiologies and clinical features of facial paralysis. (2, 40-42)

Differential diagnosis	Cause	Distinguishing characteristics
Idiopathic	Unknown	Classic Bell's palsy with other etiologies excluded
Central nervous system lesion		
Stroke	Ischemia, hemorrhage	Forehead sparing, headache, limb weakness, multiple neurologic signs
Tumor	Metastases, primary brain	Gradual onset; mental status changes. history of cancer
Autoimmune diseases	Guillain-Barré syndrome	Ascending weakness, absent reflexes
	Multiple sclerosis	Upper motor neuron signs, abnormal cerebrospinal fluid
Metabolic diseases	Diabetes (Microvascular disease)	Elevated blood glucose
Infectious diseases		
Meningitis, encephalitis	Viral, bacterial, fungal pathogen	Headache, fever, meningeal signs, abnormal cerebrospinal fluid
Herpes simplex	Reactivation of herpes simplex virus type 1 from geniculate ganglion	Fever, malaise
Lyme disease	Borrelia burgdorferi	Rash, arthralgia, malaise, bilateral facial palsy
Ramsay Hunt syndrome	Varicella zoster	Pain, vesicular eruption
Otitis media	Bacterial pathogens	Gradual onset; ear pain, fever, and conductive hearing loss
Granulomatous disease	Sarcoidosis	Bilateral facial palsy, elevated angiotensin- converting enzyme
Neoplasm	Parotid tumor, facial nerve tumor, metastasis	Insidious onset, palpable mass, partial involvement of facial nerve branches
Trauma	Surgery, basal skull fracture, facial trauma	assess for scars, bruising, blood

reported no association between facial paralysis and mRNA COVID-19 vaccines when compared with other viral vaccines in a disproportionality analysis (34). Another study reported an overall increased risk of Bell's palsy after CoronaVac vaccination but not after BNT162b2 vaccination (35). And one study concluded that patients with COVID-19 have a greater risk of acquiring Bell's palsy than those who were vaccinated against the disease (36). Further long-term analysis is necessary to determine the relationship between COVID-19 and the COVID-19 vaccine on Bell's palsy (35).

Diagnosis

The diagnosis of Bell palsy is made by excluding other causes of unilateral facial paralysis (Table 2). It is the responsibility of the evaluating clinician to conduct an appropriate patient history and to examine the patient with the specific intent of finding an underlying cause. Determining whether the facial nerve paralysis is central or peripheral is therefore key to diagnosis. Central lesions will cause paralysis of the lower face alone, sparing the forehead; however, clinicians must ensure they ask about the duration and nature of symptoms including the presence of associated symptoms such as hyperacusis, posterior auricular pain, taste, and lacrimal changes in their history (37,38). The timing and progression of Bell's palsy helps distinguish it from an acute cause such as stroke (Table 3). A key feature is the progressive nature of Bell's palsy, which can be elucidated by detailed history taking (39). A full cranial nerve examination as well as ocular, otologic and oral examinations must be carried out in all patients presenting with a facial palsy.

Laboratory testing & electrodiagnostic testing

The AAO-HNSF (American Academy of Otolaryngology—Head and Neck Surgery Foundation) guidelines recommend against the use of routine laboratory testing for new-onset Bell's palsy. This is due to low detection rates for the herpes simplex virus, or varicella zoster virus, even with the use of polymerase chain reaction, enzyme-linked immunosorbent assay (ELISA), western blot, and cerebrospinal fluid tapping (39). In Lyme endemic regions, patients should undergo an enzyme-linked immunosorbent assay or an indirect fluorescent antibody test to screen for the disease. If positive, the diagnosis of Lyme disease should be confirmed by Western blot (17). Because diabetes mellitus is present in more than 10 percent of patients with Bell's palsy, fasting glucose or A1C testing may be performed in patients with additional risk factors (e.g., family history, obesity, older than 40 years) (44). Cerebrospinal fluid analysis is generally not helpful in diagnosing Bell's palsy but can differentiate it from Guillain-Barré syndrome, leptomeningeal carcinomatosis, and infection involving the central nervous system (17).

Diagnostic imaging

The AAO-HNSF guidelines recommend against routine diagnostic imaging for new-onset Bell's palsy (39). Also, the Spanish Society of Otolaryngology (SEORL) guidelines recommend against imaging tests when the clinical symptoms indicate Bell's palsy or herpes zoster paralysis (48). The Canadian guidelines (Bell Palsy Working Group, Canadian Society of Otolaryngology – Head and Neck Surgery and Canadian Neurological Sciences Federation) advocate imaging to rule out neoplasm in patients with no improvement or progressive weakness after treatment (49). French Society of ENT (SFORL) guidelines recommended that in suspected Bell's palsy, contrast-enhanced MRI should be used to study the course of the facial nerve, including the parotid portion, within 1 month if possible, to contribute to positive diagnosis and rule out tumoral etiology. In the absence of the usual favorable progression, imaging should be repeated at 6 months (50).

Treatment

The treatment of Bell palsy focuses on maximizing recovery and minimizing associated complications (17).

Glucocorticoids

The current guidelines of the American Academy of Neurology, updated in 2012, state, "For patients with new-onset Bell palsy, steroids are highly likely to be effective and should be offered to increase the probability of recovery of facial nerve function (51). The AAO-HNSF guidelines strongly recommend the prescription of oral steroids within 72 hours of symptom onset for Bell's palsy cases aged 16 years or older. Two treatment regimens have been endorsed: either (prednisolone 50 mg for 10 days or prednisone 60 mg for 5 days with a 5-day taper) initiated within 72 hours of symptom onset. The benefit of treatment after 72 hours is less clear (39). The Canadian guidelines recommend the use of corticosteroids for all patients with Bell palsy (49). French Society of ENT (SFORL) guidelines recommend the prescription of corticosteroids at 1 mg/kg/day for 7–10 days. And in severe forms (HB grade V or VI), 10 days of high dose corticosteroids (2 mg/kg/day) seem justified unless contraindicated (50). Corticosteroids initiated within 3 days of facial palsy onset in adults increase the likelihood of recovery, shorten the time to recovery, and reduce synkinesis (involuntary movements) (52-55).

Treatment of Bell's palsy with oral corticosteroids is not without risk. Known side effects of oral corticosteroid use include gastrointestinal disturbances, loss of control of glucose levels, reactivation of peptic ulcer disease, elevated blood pressure, peripheral edema, and mood swings or episodes of acute psychosis (39).

Antiviral therapy & combined antiviral-steroid treatment

The AAO-HNSF, SFORL and the Canadian guidelines strongly recommend against antiviral treatment alone for new-onset Bell's palsy (39,49,50).

According to the AAO-HNSF guidelines, the clinician may use a combined treatment within 72 hours of symptom onset for Bell's palsy (39). The AAN guidelines also state that combined treatment may be offered to increase the probability of the recovery of facial function (51). However, the latter also mentions the necessity of counselling

Table 3 - summarizes the common differences between Bell's palsy and acute stroke (43).

	Bell's palsy	Acute stroke
Age, years	30–50	Usually >60
Symptom time course	Progressive; over hours or days	Sudden; over seconds
Unilateral facial paralysis	Yes	Yes
Upper face	Always affected	Usually not affected
Lower face	Always affected	Affected
Ability to close eye on symptomatic side	Not likely	Likely
Ear or TMJ area pain	Likely	Not likely
Hyperacusis	Likely	Not likely
Decreased lacrimation, salivation or change in taste	Likely	Not likely
Pupils affected	Not likely	Sometimes
Arm or leg weakness	Not likely	Likely
Speech or vision affected	Not likely	Likely
TMJ = temporomandibular joint.		

regarding the modest effects of potential benefits of additional antivirals and steroids (51). In the Canadian guidelines, combined treatment is recommended only for patients with severe to complete paresis (49). And the French guidelines, in severe Bell's palsy treated early (within 72 hours), antiviral treatment should be associated to corticosteroids (50). Recommended antiviral treatment dosage is Valcyclovir 1 g three times daily for 7 days or Acyclovir 400 mg five times daily for 7 days (17, 56). Combination therapy with steroids and antiviral agents resulted in significantly higher favorable recovery rates than steroids alone in severe Bell's palsy patients. Combination therapy was particularly more effective than steroids alone in patients aged ≥40 years and in patients without hypertension and diabetes (57,58).

The most observed side effects of antiviral therapy are gastrointestinal related and include nausea, vomiting, and diarrhea, with rare severe reactions, including hives, bronchospasm, angioedema, and hepatic or renal failure (39).

Acupuncture and physical therapy

The AAO-HNSF state that no recommendation can be made regarding the effect of acupuncture in Bell's palsy patients (39). Also, the French Society of ENT (SFORL) guidelines recommend against the use of acupuncture in Bell's palsy patients (50). In addition, a recent meta-analysis on acupuncture reported insufficient evidence to support the efficacy and safety of acupuncture due to the poor quality and the heterogeneity of relevant research (59).

In the AAO-HNSF guidelines, no recommendations are made in relation to physical therapy other than that physiotherapy for acute illness is specifically not recommended (39). The Canadian guidelines make no recommendation regarding the use of exercise physiotherapy for acute Bell palsy of any severity. However, they suggest exercise physiotherapy for patients with persistent weakness (49). The French Society of ENT (SFORL) guidelines recommend the treatment by a rehabilitation specialist (speech therapist or physiotherapist, with relevant qualifications) in severe Bell's palsy or in case of factors for poor recovery (50). Also, the Spanish Society of Otolaryngology (SEORL) guidelines recommend rehabilitative physical therapy in severe Bell's palsy to improve sequelae that have developed and help ensure they are less severe if the physical therapy is provided at the right time (48).

The French Society of ENT (SFORL) guidelines and the Canadian guidelines recommended against the use of electrotherapy in Bell's palsy patients (49,50).

Surgical decompression

The AAO-HNSF recommend against surgical decompression for patients with Bell's palsy (39).

On the other hand, the French guidelines state that further well-conducted studies should be performed before declaring such treatment ineffective, and make recommendation that in severe forms, decompression should be performed early to avoid irreversible nerve injury, and if ENMG shows > 90% degeneration, decompression should be performed rapidly (50). If surgical facial nerve decompression is implemented, it must include the meatal

foramen, the labyrinthine segment, the beginning of the second part of the nerve, and the geniculate ganglion. A transmastoid or a supratemporal approach may be used, but the latter is the gold standard (50).

The Canadian guidelines recommend against the routine use of surgical decompression. They state that patients should consider this option only if they have severe facial nerve degeneration on electroneuronography, if they are willing to accept the surgical risks and if the surgery is to be performed in an advanced treatment facility (49). Surgical decompression has potentially serious risks, including hearing loss (3%–10% of patients), further damage to the facial nerve and leaks of cerebrospinal fluid (4%) (60,61).

Eye care

The main functional complications in Bell's palsy are ophthalmologic: inadequate lubrication or hydration of the cornea can lead to exposure keratitis, corneal ulceration and eventually loss of vision (39, 48-50).

The AAO-HNSF, the Spanish Society of Otolaryngology (SEORL), French Society of ENT (SFORL) and the Canadian guidelines strongly recommend that eye care should be implemented for the treatment of Bell's palsy (39,48-50). It is critical to recommend supportive eye care for all Bell's palsy patients with incomplete eye closure. Initially, eye drops, protective gel or artificial tears several times daily and especially at night should be used in patients with incomplete eye closure (39,48, 50, 56). Patients should be educated about strategies for eye closure (ie, taping), moisturization (ie, eye ointment, artificial tears, humidified eye chambers) and wearing sunglasses with side protection to avoid irritation from the sun's rays and dust (39, 48 ,56). The presence of ocular symptoms such as pain, irritation, or itching should prompt an expeditious referral to an ophthalmologist to prevent corneal damage (39, 50). A detailed ophthalmologic evaluation should be done for patients who fail supportive eye care or patients with severe and persistent lagophthalmos. Recommended eye treatments in those patients may include the use of botulinum toxin injections, or temporary or permanent tarsorrhaphy or lid loading with gold-weight, autogenous temporalis fascia and platinum chains (62-65).

Treatment of Bell's palsy in challenging cases

Diabetes mellitus

There is only limited available evidence on the treatment of facial palsy in diabetic patients because such patients were excluded from most of the relevant clinical trials. In one clinical trial, diabetic patients with Bell's palsy had a higher rate of complete recovery of facial weakness if they were treated with glucocorticoids (97% vs. 58%) and many patients under diabetic therapy kept their diabetes under good control (66). In another study, diabetic patients were found to have more severe facial weakness at first, but similar outcomes at six months (6).

The AAO-HNSF state that diabetic patients with Bell's palsy should be treated with steroids on an individualized basis (39).

Children

Several studies indicate that the prognosis of untreated Bell's palsy in children is better and that children show higher rates of spontaneous recovery than do adults; therefore, the potential benefit of corticosteroid treatment is inconclusive (67).

Despite the absence of quality trials supporting steroid use in children, given the presumed similar disease process of Bell's palsy in adults and children, as well as the generally favorable benefit-harm ratio of steroid therapy, the AAO-HNSF state that oral steroids may be considered in pediatric patients with a large role for caregiver involvement in the decision-making process (39). For children, the recommended dose of prednisone or prednisolone is 2 mg/kg for 10 days (56).

Pediatric Bell's palsy patients were not included in the antiviral trials, and therefore there is no evidence supporting the use of antiviral therapy alone in pediatric patients with Bell's palsy. And the AAO-HNSF made no comment regarding whether a steroid and antiviral combination might be recommended (39). Several studies indicate that the combination therapy of acyclovir plus prednisolone is not superior to prednisolone alone except in severe cases (68,69).

Pregnancy

Most cases of Bell's palsy in pregnancy occur during the third trimester or the first week after childbirth and, in general, prognosis is worse than in non-pregnant women (70,71).

The AAO-HNSF state that pregnant women should be treated on an individualized basis with oral steroids (39). The Spanish Society of Otolaryngology (SEORL) recommended that prednisolone or methylprednisolone be used, since they cross the placental barrier to a lesser extent (48). The use of antivirals is controversial, and the risk-benefit ratio should be assessed considering the possibility of herpes zoster infection (48). The AAO-HNSF state that pregnant women should be treated on an individualized basis with combination antiviral therapy (39). The treatment must be coordinated with the patient's obstetrician (48).

Treatment of Bell's palsy during the COVID–19 pandemic

The AAO-HNSF published a statement on Bell's palsy treatment during the COVID pandemic. The recommendations are:

In patients who develop Bell's palsy shortly after vaccination: Corticosteroid therapy with or without anti-herpes viral therapy (acyclovir, valacyclovir) is recommended. Patients should be counseled that the effect of corticosteroids on the safety and efficacy of Pfizer-BioNTech or Moderna vaccines is currently unknown. However, immunocompromising conditions and the use of immunocompromising medications are not contraindications to vaccination with either of these vaccines.

• In unvaccinated patients who develop Bell's palsy: Corticosteroid therapy with or without anti-herpes viral therapy (acyclovir, valacyclovir) is recommended. Patients may proceed with vaccination while being treated for Bell's palsy with corticosteroids versus delaying vaccination until after completion of corticosteroid course, in discussion with their healthcare provider (72).

Patient follow-ups

The AAO-HNSF guidelines recommend that clinicians should reassess or refer to a facial nerve specialist those Bell's palsy patients with (1) new or worsening neurologic findings at any point, (2) ocular symptoms developing at any point, or (3) incomplete facial recovery 3 months after initial symptom onset (39). Similarly, the Canadian guidelines recommend referral to a specialist for patients with no improvement or progressive weakness (49).

The French Society of ENT (SFORL) recommend clinical and ophthalmological follow-up for several months after recovery begins, to ensure against complications, and ophthalmic complications in particular (50).

Prognosis

About 71% of patients with Bell's palsy have motor function recovery completely within 6 months without treatment (2).

Poor prognostic factors include elderly patients, severe palsy at presentation, degeneration on ENoG, hypertension, diabetes mellitus, and impairment of taste (73-77).

13% of patients may have a mild residual paresis (facial asymmetry) that is not distressing, while 4% have severe residual paresis (78). Facial synkinesis is due to aberrant nerve regeneration and occurs in 15% to 20% of patients after recovery from Bell's palsy with 6.6% of patients developing moderate-to-severe synkinesis (79,80). Patients may describe tearing while chewing ("crocodile tears"), which occurs in 3.3% of patients with Bell's palsy after approximately 6 to 9 months (81,82). Facial synkinesis and crocodile tears can be treated with botulinum toxin injection (83,84).

Conclusion

The symptoms of Bell's palsy vary from mild to severe. The etiology of Bell's palsy is still unclear.

Establishing the correct diagnosis is imperative to avoid missing another treatable condition. Determining whether the facial nerve paralysis is central or peripheral is important. The history of a Bell's palsy case should include discomfort or sensory symptoms in the distribution of the facial nerve in the hours or days preceding facial palsy, and it is very important to reveal whether the symptoms were progressive in nature.

Although many patients with Bell palsy will experience improvement in their facial nerve function without treatment, persistent facial weakness can have implications for quality of life. Choosing the correct treatment options for suitable patients can optimize the likelihood of recovery.

Oral steroids should be prescribed within 72 hours of symptoms onset for Bell's palsy patients (39,49,50). Combined steroid and antiviral treatment are recommended for patients with severe to complete paresis (39,49,50). Physiotherapy may be suggested in severe Bell's palsy (49,50). Surgical decompression is not recommended and may be considered in severe facial nerve degeneration on electroneuronography and if the patient is willing to accept the surgical risks (49,50). Eye protection remains crucial in preventing long-term eye complications (39, 48-50). Clinical and ophthalmological follow-up, and referral to a specialist for patients with no improvement or progressive weakness are recommended.

References

1. Grzybowski A, Kaufman MH. Sir Charles Bell (1774-1842): contributions to neuro-ophthalmology. Acta Ophthalmol Scand 2007; 85:897–901.
2. Peitersen E. Bell's palsy: the spontaneous course of 2,500 peripheral facial nerve palsies of different etiologies. Acta Otolaryngol Suppl 2002:4-30.
3. Monini S, Lazzarino AI, Iacolucci C, Buffoni A, Barbara M. Epidemiology of Bell's palsy in an Italian Health District: incidence and case-control study. Acta Otorhinolaryngol Ital. 2010 Aug;30(4):198. PMID: 21253285; PMCID: PMC3008145.
4. De Diego-Sastre JI, Prim-Espada MP, Fernández-García F. Epidemiología de la parálisis facial de Bell [The epidemiology of Bell's palsy]. Rev Neurol. 2005 Sep 1-15;41(5):287-90. Spanish. PMID: 16138286.
5. Morris AM, Deeks SL, Hill MD, et al. Annualized incidence and spectrum of illness from an outbreak investigation of Bell's palsy. Neuroepidemiology 2002; 21:255–261.
6. Bosco D, Plastino M, Bosco F, et al. Bell's palsy: a manifestation of prediabetes? Acta Neurol Scand 2011; 123:68–72.
7. Riga M, Kefalidis G, Danielides V. The role of diabetes mellitus in the clinical presentation and prognosis of Bell palsy. J Am Board Fam Med 2012; 25:819–826.
8. Hilsinger RL Jr, Adour KK, Doty HE. Idiopathic facial paralysis, pregnancy, and the menstrual cycle. Ann Otol Rhinol Laryngol 1975; 84:433–442.
9. Savadi-Oskouei D, Abedi A, Sadeghi-Bazargani H. Independent role of hypertension in Bell's palsy: a case-control study. Eur Neurol 2008; 60:253–257.
10. Sinnatamby CS (2011) Last's Anatomy: Regional and Applied. Edinburgh: Churchill Livingstone.
11. Ellis H and Mahadevan V (2013) Clinical Anatomy: Applied Anatomy for Students and Junior Doctors. Chichester: Wiley-Blackwell.
12. Heckmann JG, Urban PP, Pitz S, Guntinas-Lichius O, Gágyor I. The Diagnosis and Treatment of Idiopathic Facial Paresis (Bell's Palsy). Dtsch Arztebl Int. 2019 Oct 11;116(41):692-702. doi: 10.3238/arztebl.2019.0692. PMID: 31709978; PMCID: PMC6865187.
13. Somasundara D, Sullivan F. Management of Bell's palsy. Aust Prescr. 2017 Jun;40(3):94–7.
14. House JW, Brackmann DE. Facial nerve grading system. Otolaryngol Head Neck Surg. 1985; 93:146-147.

15. Ross BG, Fradet G, Nedzelski JM. Development of a sensitive clinical facial grading system. Otolaryngol Head Neck Surg. 1996 Mar;114(3):380-6. doi: 10.1016/s0194-5998(96)70206-1. PMID: 8649870.
16. Volk GF, Schaede RA, Thielker J, et al.: Reliability of grading of facial palsy using a video tutorial with synchronous video recording. Laryngoscope 2019, in press.
17. Patel DK, Levin KH. Bell palsy: Clinical examination and management. Cleve Clin J Med. 2015 Jul;82(7):419-26. doi: 10.3949/ccjm.82a.14101. PMID: 26185941.
18. Abdel-Aziz M, Azab NA, Khalifa B, Rashed M, Naguib N (2015) The association of Varicella zoster virus reactivation with Bell's palsy in children. Int J Pediatr Otorhinolaryngol 79:328–331. https ://doi.org/10.1016/j.ijpor l.2014.12.010.
19. Zandian A, Osiro S, Hudson R, Ali IM, Matusz P, Tubbs SR, Loukas M (2014) The neurologist's dilemma: a comprehensive clinical review of Bell's palsy, with emphasis on current management trends. Med Sci Monit 20:83–90.
20. Voss V, Mattox A, Guo M (2017) Concurrent pityriasis rosea and Bell's palsy. BMJ Case Rep. https ://doi.org/10.1136/bcr-2016-218069.
21. Kamath A, Maity N, Nayak MA. Facial paralysis following influenza vaccination: a disproportionality analysis using the Vaccine Adverse Event Reporting System Database. Clin Drug Investig. 2020;40(9):883-889. doi:10. 1007/s40261-020-00952-0
22. Rowhani-Rahbar A, Klein NP, Lewis N, et al. Immunization and Bell's palsy in children: a case-centered analysis. Am J Epidemiol. 2012;175(9):878-885. doi:10.1093/aje/kws011
23. Zambito Marsala S, Pistacchi M, Gioulis M, Gentile M (2016) Facial palsy in cerebral venous thrombosis: an atypical case in adults. Acta Neurol Belg 116:341–343. https ://doi.org/10.1007/s1376 0-015-0565-2
24. Gatto LAM, Saurin F, Koppe GL, Demartini ZJ (2017) Facial palsy after embolization of dural arteriovenous fistula: a case report and literature review. Surg Neurol Int 8:270. https ://doi.org/10.4103/sni.sni_428_16.
25. Atan D, İkincioğulları A, Köseoğlu S, Özcan KM, Çetin MA, Ensari S, Dere H (2015) New predictive parameters of Bell's palsy: neutrophil to lymphocyte ratio and platelet to lymphocyte ratio. Balkan Med J 32:167–170
26. Kum RO, Yurtsever Kum N, Ozcan M, Yilmaz YF, Gungor V, Unal A, Ciliz DS (2015) Elevated neutrophil-to-lymphocyte ratio in Bell's palsy and its correlation with facial nerve enhancement on MRI. Otolaryngol Head Neck Surg 152:130–135. https ://doi.org/10.1177/0194599814555841.
27. Gorodezky C, Carranza JM, Bustamante A, Yescas P, Martinez A, Alonso Vilatela ME (1991) The HLA system and T-cell subsets in Bell's palsy. Acta Otolaryngol 111:1070–1074
28. Spengos K, Sameli S, Stouraitis G, Kolias A, Koulouri O, Kokkino Z, Makrylou I, Tsivgoulis A, Tsivgoulis G, Vassilopoulos D (2006) Seasonal variation of Bell's palsy in Athens, Greece—hospital-based retrospective evaluation over fifteen years. Eur Neurol 55:84–88. https ://doi.org/10.1159/00009 2779
29. Hsieh RL, Wang LY, Lee WC (2013) Correlation between the incidence and severity of Bell's palsy and seasonal variations in Taiwan. Int J Neurosci 123:459–464. https ://doi.org/10.3109/00207454.2013.76380 4
30. Kar, Murat & Altıntaş, Mustafa. (2021). Seasonal Distribution of Bell's Palsy. Indian Journal of Otolaryngology and Head & Neck Surgery. 10.1007/s12070-021-02796-2.
31. Vaccines and Related Biological Products Advisory Committee Vaccines and Related Biological Products Advisory Committee December 17, 2020, meeting: FDA review of efficacy and safety of Moderna COVID-19 vaccine emergency use authorization request. https://www.fda.gov/media/144585/download
32. Vaccines and Related Biological Products Advisory Committee Vaccines and Related Biological Products Advisory Committee December 10, 2020, meeting: FDA review of efficacy and safety of Pfizer-BioNTech COVID-19 vaccine emergency use authorization request. https://www.fda.gov/media/144337/download
33. Cirillo N, Doan R. Bell's palsy and SARS-CoV-2 vaccines—an unfolding story. Lancet Infect Dis 2021; published online June 7. https://doi.org/10.1016/ S1473-3099(21)00273-5.
34. Renoud L, Khouri C, Revol B, et al. Association of facial paralysis with mRNA COVID-19 vaccines: a disproportionality analysis using the World Health Organization pharmacovigilance database. JAMA Intern Med 2021; published online April 27. https://doi.org/10.1001/jamainternmed.2021.2219.
35. Wan, Eric & Chui, Celine & Lai, Francisco & Chan, Esther & Li, Xue & Yan, Vincent & le, Gao & Yu, Qiuyan & Lam, Ivan & Chun, Raccoon & Cowling, Benjamin & Fong, Wing & Lau, Alexander & Mok, Vincent & Chan, Frank & Lee, Cheuk-kwong & Chan, Lot & Lo, Dawin & Lau, Gary & Wong, Ian. (2021). Bell's palsy following vaccination with mRNA (BNT162b2) and inactivated (CoronaVac) SARS-CoV-2 vaccines: a case series and nested case-control study. The Lancet Infectious Diseases. 22. 10.1016/S1473-3099(21)00451-5.
36. Tamaki A, Cabrera CI, Li S, et al. Incidence of Bell palsy in patients with COVID-19. JAMA Otolaryngol Head Neck Surg 2021; published online June 24. https://doi.org/10.1001/jamaoto.2021.1266.
37. Gilden DH. Bell's palsy. N Engl J Med 2004; 351: 1323 – 31.
38. Ho M-L, Juliano A, Eisenberg RL et al. Anatomy and pathology of the facial nerve. Am J Roentgenol 2015; 204: W612 – 9.
39. Baugh RF, Basura GJ, Ishii LE et al. Clinical practice guideline: Bell's palsy. Otolaryngol Head Neck Surg 2013; 149 (3Suppl): S1 – 27.
40. Hohman MH, Hadlock TA. Etiology, diagnosis, and management of facial palsy: 2000 patients at a facial nerve center. Laryngoscope 2014; 124: E283–E293.
41. Redaelli de Zinis LO, Gamba P, Balzanelli C. Acute otitis media and facial nerve paralysis in adults. Otol Neurotol 2003; 24:113-7.
42. Fuller G, Morgan C: Bell's palsy syndrome: mimics and chameleons. Pract Neurol 2016; 16: 439–44.

43. Induruwa I, Holland N, Gregory R, Khadjooi K. The impact of misdiagnosing Bell's palsy as acute stroke. Clin Med (Lond). 2019 Nov;19(6):494-498. doi: 10.7861/clinmed.2019-0123. PMID: 31732591; PMCID: PMC6899254.
44. Adour K, Wingerd J, Doty HE. Prevalence of concurrent diabetes mellitus and idiopathic facial paralysis (Bell's palsy). Diabetes 1975; 24:449-51.
45. Baba S, Kondo K, Kanaya K, Ushio M, Tojima H, Yamasoba T (2011) Bell's palsy in children: relationship between electroneurography findings and prognosis in comparison with adults. Otol Neurotol 32(9):1554–1558
46. Adour KK, Sheldon MI, Kahn ZM (1980) Maximal nerve excitability testing versus neuromyography: prognostic value in patients with facial paralysis. The Laryngoscope 90(9):1540–1547
47. Sinha PK, Keith RW, Pensak ML (1994) Predictability of recovery from Bell's palsy using evoked electromyography. The Am J Otol 15(6):769–771
48. Lassaletta L, Morales-Puebla JM, Altuna X, Arbizu Á, Arístegui M, Batuecas Á, Cenjor C, Espinosa-Sánchez JM, García-Iza L, García-Raya P (2020) Facial paralysis: clinical practice guideline of the Spanish society of otolaryngology. Acta Otorrinolaringologica (English Edition) 71(2):99–118
49. de Almeida JR, Guyatt GH, Sud S, Dorion J, Hill MD, Kolber MR, et al. Management of Bell palsy: clinical practice guideline. CMAJ 2014;186(12):917-22.
50. Fieux M, Franco-Vidal V, Devic P, Bricaire F, Charpiot A, Darrouzet V, Denoix L, Gatignol P, Guevara N, Montava M, Roch JA, Tankéré F, Tronche S, Veillon F, Vergez S, Vincent C, Lamas G, Tringali S (2020) French society of ENT (SFORL) guidelines. Management of acute Bell's palsy. Eur Ann Otorhinolaryngol Head Neck Dis 137(6):483–488. https ://doi.org/10.1016/j.anorl .2020.06.004
51. Gronseth GS, Paduga R; American Academy of Neurology. Evidence based guideline update: steroids and antivirals for Bell palsy: report of the Guideline Development Subcommittee of the American Academy of Neurology. Neurology 2012; 79:2209–2213.
52. Sullivan FM, Swan IRC, Donnan PT, et al. Early treatment with prednisolone or acyclovir in Bell's palsy. N Engl J Med. 2007; 357:1598-1607.
53. Engstrom M, Berg T, Stjernquist-Desatnik A, et al. Prednisolone and valaciclovir in Bell's palsy: a randomised, double-blind, placebocontrolled, multicentre trial. Lancet Neurol. 2008; 7:993-1000.
54. de Almeida JR, Al Khabori M, Guyatt GH, et al. Combined corticosteroid and antiviral treatment for Bell palsy: a systematic review and metaanalysis. JAMA. 2009; 302:985-993.
55. Numthavaj P, Thakkinstian A, Dejthevaporn C, et al. Corticosteroid and antiviral therapy for Bell's palsy: a network meta-analysis. BMC Neurol. 2011; 11:1.
56. Garro A, Nigrovic LE. Managing Peripheral Facial Palsy. Ann Emerg Med. 2018 May;71(5):618-624. doi: 10.1016/j.annemergmed.2017.08.039. Epub 2017 Oct 27. PMID: 29110887.
57. Kim Y, Doo JG, Chon J, Lee JH, Jung J, Lee JM, Kim SH, Yeo SG. Steroids plus antiviral agents are more effective than steroids alone in the treatment of severe Bell's palsy patients over 40 years of age. Int J Immunopathol Pharmacol. 2021 Jan-Dec; 35:20587384211042124. doi: 10.1177/20587384211042124. PMID: 34633253; PMCID: PMC8511921.
58. Lee HY, Byun JY, Park MS, Yeo SG. Steroid-antiviral treatment improves the recovery rate in patients with severe Bell's palsy. Am J Med. 2013 Apr;126(4):336–41
59. Zhang R, Wu T, Wang R, et al. (2019) Compare the efficacy of acupuncture with drugs in the treatment of Bell's palsy: A systematic review and meta-analysis of RCTs. Medicine 98(19): e15566. DOI: 10.1097/MD.0000000000015566.
60. Gantz BJ, Rubinstein JT, Gidley P, et al. Surgical management of Bell's palsy. Laryngoscope 1999; 109:1177-88.
61. Brown JS. Bell's palsy: a 5-year review of 174 consecutive cases: an attempted double-blind study. Laryngoscope 1982; 92:1369-73.
62. Miwa H, Kondo T, Mizuno Y. Bell's palsy-induced blepharospasm. J Neurol. 2002; 249:452-454.
63. Bracewell RM. The treatment of Bell's palsy. N Engl J Med. 2007; 357:1598-1607.
64. Wambier SP, Garcia DM, Cruz AA, Messias A. Spontaneous blinking kinetics on paralytic lagophthalmos after lid load with gold weight or autogenous temporalis fascia sling. Curr Eye Res 2016;41(4):433-40.
65. Ben Artsi E, Ullrich K, Brusasco L, Malhotra R. Long-term outcomes of upper eyelid loading with platinum segment chains for lagophthalmos: an adjustable approach. Am J Ophthalmol 2020; 214:188-95.
66. Saito O, Aoyagi M, Tojima H, Koike Y: Diagnosis and treatment for Bell's palsy associated with diabetes mellitus. Acta Otolaryngol Suppl 1994; 511: 153–5.
67. Pitaro J, Waissbluth S, Daniel SJ. Do children with Bell's palsy benefit from steroid treatment? A systematic review. Int J Pediatr Otorhinolaryngol. 2012 Jul;76(7):921-6. doi: 10.1016/j.ijporl.2012.02.044. Epub 2012 Apr 13. PMID: 22503409.
68. Khajeh A, Fayyazi A, Soleimani G, Miri-Aliabad G, Shaykh Veisi S, Khajeh B. Comparison of the Efficacy of Combination Therapy of Prednisolone - Acyclovir with Prednisolone Alone in Bell's Palsy. Iran J Child Neurol. 2015 Spring;9(2):17-20. PMID: 26221158; PMCID: PMC4515336.
69. Gürbüz, G. (2020). The Efficacy of Acyclovir in Childhood Bell's Palsy. Turkish Journal of Neurology/Turk Noroloji Dergisi, 26(2): 160-164
70. Hussain A, Nduka C, Moth P, Malhotra R: Bell's facial nerve palsy in pregnancy: a clinical review. J Obstet Gynaecol 2017; 37: 409–15.
71. Phillips KM, Heiser A, Gaudin R, Hadlock TA, Jowett N. Onset of bell's palsy in late pregnancy and early puerperium is associated with worse long-term outcomes. Laryngoscope. 2017 Dec;127(12):2854-2859. doi: 10.1002/lary.26569. Epub 2017 Mar 27. PMID: 28349542.

72. AAO-HNS Statement on Treatment of Idiopathic Facial Paralysis (Bell's Palsy) During the COVID-19 Pandemic. Available online: https://ohns.ucsf.edu/news/aao-hns-statement-treatment-idiopathic-facial-paralysis-bell%E2%80%99s-palsy during-covid-19-pandemic.
73. Ferreira M, Firmino-Machado J, Marques EA, Santos PC, Simoes AD, Duarte JA: Prognostic factors for recovery in Portugese patients with Bell´s palsy. Neurol Res 2016; 38: 851–6.
74. Psillas, G.; Dimas, G.G.; Sarafidou, A.; Didangelos, T.; Perifanis, V.; Kaiafa, G.; Mirkopoulou, D.; Tegos, T.; Savopoulos, C.; Constantinidis, J. Evaluation of Effects of Diabetes Mellitus, Hypercholesterolemia and Hypertension on Bell's Palsy. J. Clin. Med. 2021, 10, 2357. https://doi.org/ 10.3390/jcm10112357
75. Escalante DA, Malka RE, Wilson AG, Nygren ZS, Radcliffe KA, Ruhl DS, Vincent AG, Hohman MH. Determining the Prognosis of Bell's Palsy Based on Severity at Presentation and Electroneuronography. Otolaryngol Head Neck Surg. 2022 Jan;166(1):151-157. doi: 10.1177/01945998211004169. Epub 2021 Mar 30. PMID: 33784203.
76. Yoo, M.C.; Park, D.C.; Yeo, S.G. Association between Initial Severity of Facial Weakness and Outcomes of Bell's Palsy. J. Clin. Med. 2021, 10, 3914. https://doi.org/ 10.3390/jcm10173914
77. Yoo MC, Soh Y, Chon J, Lee JH, Jung J, Kim SS, You MW, Byun JY, Kim SH, Yeo SG. Evaluation of Factors Associated with Favorable Outcomes in Adults with Bell Palsy. JAMA Otolaryngol Head Neck Surg. 2020 Mar 1;146(3):256-263. doi: 10.1001/jamaoto.2019.4312. PMID: 31971554; PMCID: PMC6990801.
78. Peitersen E: The natural history of Bell 's palsy. Am J Otol 1982; 4:107–11.
79. Bylund N, Jensson D, Enghag S, et al.: Synkinesis in Bell´s palsy in a randomized controlled triel. Clin Otolaryngol 2017; 42: 673–80.
80. Celik M, Forta H, Vural C. The development of synkinesis after facial nerve paralysis. Eur Neurol 2000; 43:147–151.
81. Valença MM, Valença LP, Lima MC. [Idiopathic facial paralysis (Bell's palsy): a study of 180 patients]. Arq Neuropsiquiatr. 2001 Sep;59(3-B):733-9.
82. Yamamoto E, Nishimura H, Hirono Y. Occurrence of sequelae in Bell's palsy. Acta Otolaryngol Suppl. 1988; 446:93-6.
83. Chua CN, Quhill F, Jones E, Voon LW, Ahad M, Rowson N. Treatment of aberrant facial nerve regeneration with botulinum toxin A. Orbit 2004; 23:213–218.
84. Nava-Castañeda A, Tovilla-Canales JL, Boullosa V, Tovilla-y-Pomar JL, Monroy-Serrano MH, Tapia-Guerra V, Garfias Y. Duration of botulinum toxin effect in the treatment of crocodile tears. Ophthalmic Plast Reconstr Surg. 2006 Nov-Dec;22(6):453-6.

Maternal congenital diaphragmatic hernia complicated with left pulmonary compression in the third trimester of pregnancy

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Abstract

Cases of symptomatic diaphragmatic hernia in pregnancy are often misdiagnosed due to the nonspecific presentation, placing pregnant women at risk. This case report discusses the presentation and management of a 17-year-old patient who had congenital diaphragmatic hernia complicated with left pulmonary compression in the third trimester of pregnancy

Keywords: Maternal congenital diaphragmatic, pulmonary compression, third trimester

Introduction

The presence of abdominal viscera in the thoracic cavity is known as congenital diaphragmatic hernia (CDH) (1). It's a rather uncommon congenital abnormality, and the diagnosis is usually made antenatally by ultrasonography or shortly after birth as a result of the baby's respiratory problems (2). Bochdalek hernia (BH), a posterolateral lesion in the diaphragm, is the most prevalent kind of CDH (3).

Bochdalek hernia can sometimes go unnoticed until adulthood. However, cases that remained asymptomatic for long periods of time and only emerged later were identified, with a 0.17 percent incidence in 22 individuals (17 women, 5 men) based on 13,138 cases (4). Pregnancy is one of the causes of symptomatic Bochdaleck hernia in adults (5).

The rise in intraabdominal pressure during pregnancy causes the abdominal organs to enter the thoracic cavity, resulting in symptomatic hernia. Maternal mortality is reported to be 6%, whereas neonatal mortality is reported to be 19% (6). Due to nonspecific symptoms, diaphragmatic hernias are frequently misdiagnosed, putting pregnant women in danger (7).

Here, we are presenting a case of a young woman with a diaphragmatic hernia in the last trimester of pregnancy that was diagnosed initially as acute pancreatitis, and later on found to be congenital diaphragmatic hernia complicated with left pulmonary compression. We summarize in our case report the experience of successful treatment for this condition.

Case presentation

A 17 year old woman who was primigravida 29 weeks +4 days gestational age presented to the emergency department. She had a history of severe nausea and vomiting for three days, associated with epigastric pain radiating to the back. The epigastric pain was progressive with partial improvement upon lying forwards. She had diarrhea and no history of headache, visual symptoms, right upper quadrant pain or fever. She complained of dyspnea without any chest pain; there were no other respiratory symptoms. She reported good fetal movements, no labour pain, no vaginal bleeding nor leaking. The patient had no previous known medical history or previous surgery. Her antenatal visits in a polyclinic were unremarkable.

On examination in the emergency department the patient looked ill, in pain, sitting in a leaning forward position and no jaundice was noted. Oxygen saturation was reduced, with tachycardia and tachypnea and she had a normal blood pressure reading. The abdominal examination showed rigidity, tenderness in the epigastric area with no palpable masses. Vaginal examination showed a closed cervix and limbs had no signs of deep venous thrombosis; Cardiotocography applied baseline was 170bpm, good variability, no decelerations seen and no uterine contractions. Abdominal ultrasound performed in the ER showed normal gallbladder with no intraluminal stones. The common biliary duct was not visualized and no intrahepatic biliary ductal dilatation was found. Chest x ray showed left hemithorax with contralateral mediastinal shift (Figure 1). Obstetric ultrasound showed positive fetal heartbeat, cephalic presentation and adequate amniotic fluid. Investigations were performed in the emergency department and showed that the amylase level was 735 U/L, lipase was 466 U/L and potassium level was 2.9 (mmol/L). Liver function tests were normal, random blood sugar was 7.6 (mmol/L) .Venous blood gas sample showed PH was 7.39 and lactate level was 1.4 (mmol/L). Cholesterol and lipid was normal. Cardiac enzymes, troponin levels and electrocardiogram were normal.

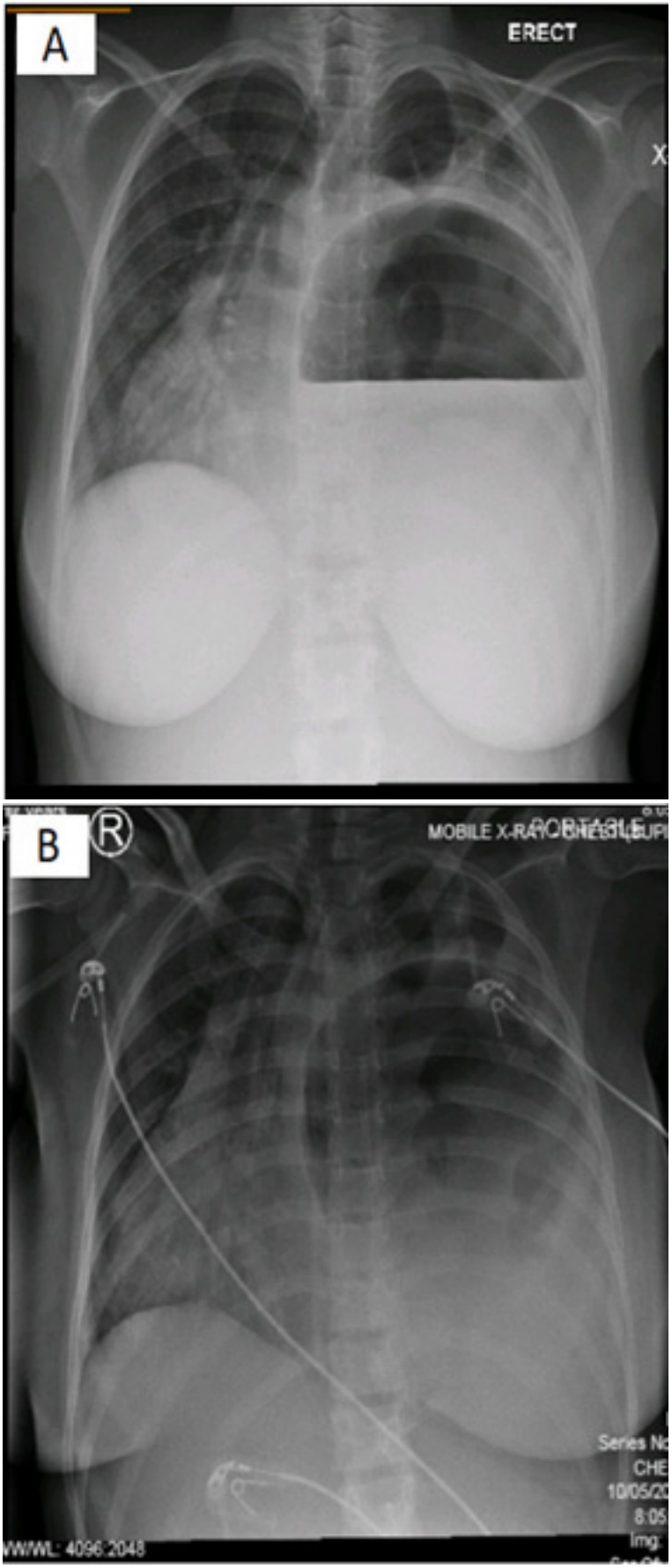
Impression was acute pancreatitis in pregnancy. Plan was for Admission in Labor room for conservative management by decompressing stomach with Nasogastric tube, giving antiemetics, intravenous fluid to keep NPO (nothing per mouth).

The patient was admitted to the labour room for close monitoring of her vital signs, clinical and fetal status. Later on, she started to have regular uterine contractions with cervical changes. It was decided to manage preterm labor with magnesium sulfate for neuroprotection and Atosiban as tocolytic. She received 1 dose of 6 mg Dexamethasone Intramuscularly for the lung maturity in the emergency room.

During her stay in the labor room, the oxygen saturation dropped further to 92 percent with oxygen mask. Venus blood gas showed metabolic acidosis PH was 7.32 and raised lactate 5.2 (mmol/L). The surgical intensive care team were informed and a decision was taken to perform emergency caesarean section with exploratory laparotomy due to deteriorating status of patient. Repeat portable chest Xray was done and showed worsening left lung collapse and contralateral mediastinal shift (Figure B). There was a dilemma as to inserting a chest tube before taking her to the operating room, however it was then decided to first perform the surgery to know the reason for her hemithorax.

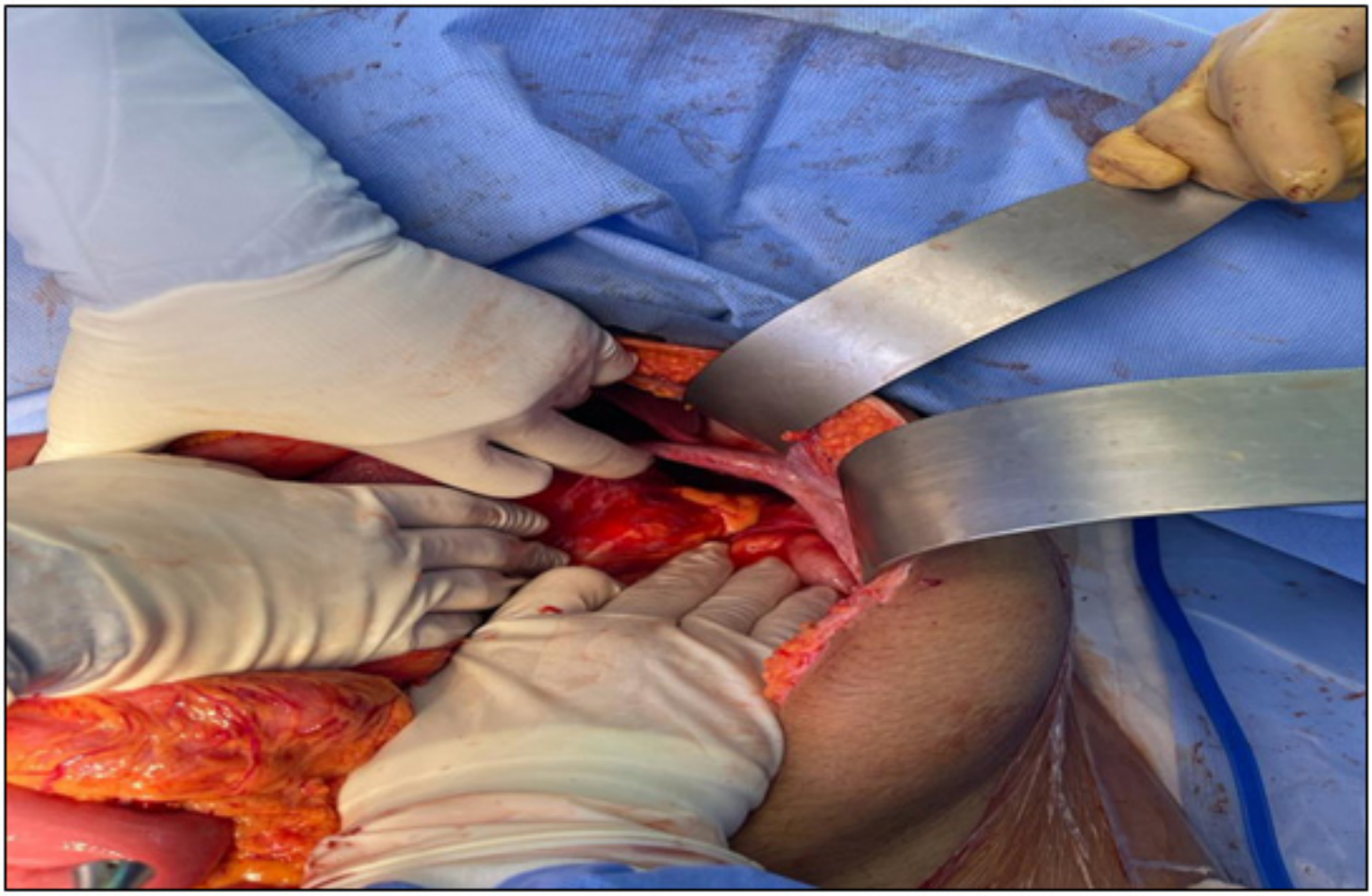
In the operating room, under general anesthesia, skin midline incision done, lower uterine transverse incision was performed. The baby boy was delivered in cephalic presentation, he cried and was transferred to the neonatal Intensive care unit with continuous positive airway pressure. The baby's weight was 1.2 kg, APGAR score was 7 at 1 min and 10 at 5 min and the cord PH was 7.24. The midline incision extended upwards to the xiphoid and a distended stomach was seen and was decompressed with a nasogastric tube. The left kidney, spleen and part of the large bowel was found in the thoracic cavity and the abdominal organs were reduced back to the anatomical position. Intraoperatively, a 6 cm left large posterior-lateral diaphragmatic hernia was identified (Figure 2). The defect was repaired with Phasix™ Mesh 20*20. Postoperatively, the patient recovered well and postoperative chest Xray was normal. She had a good recovery and was discharged in good condition on the 7th postoperative day and was instructed to take contraception.

Figure 1: A Chest radiograph showing stomach in left hemithorax with contralateral mediastinal and tracheal shifting, B after NGT (nasogastric tube) insertion.



Chest X-ray after nasogastric tube insertion and just before exploratory laparotomy

Figure 2: Left posterolateral diaphragmatic defect with smooth edges



Discussion

Symptomatically it is s uncommon to have a congenital posterolateral diaphragmatic hernia during pregnancy. Left posterolateral defect is the most prevalent type of diaphragmatic hernia (1). by Jin-Young Choi reviewed 43 cases of of symptomatic Bochdaleck hernia in pregnancy from 1941 to 2020 in a systemic review published in 2021(1) Bochdaleck hernia is a type of congenital diaphragmatic hernia that accounts for 75% of all congenital diaphragmatic hernias (1).

Because of the clinical symptoms and elevated amylase and lipase levels, the initial diagnosis in this instance was acute pancreatitis (1). The same first impression was observed in earlier case reports, where severe pancreatitis in pregnancy was assumed and ultimately confirmed as maternal diaphragmatic hernia (8,9). When a patient presents with severe nausea, vomiting, and epigastric discomfort, as well as shortness of breath and low oxygen saturation, a computerised tomography (CT) scan or magnetic resonance imaging chest and abdomen should be conducted to aid in the diagnosis (1, 10).

Because the patient had metabolic acidosis, it was decided to perform an emergency caesarean section and exploratory laparotomy. The increased intraabdominal pressure generated by the gravid uterus's growing development causes the congenital diaphragmatic hernia to be symptomatic. The abdominal organs in the thorax herniated, causing left lung collapse and contralateral mediastinal displacement (11). We were able to lower the intra-abdominal pressure in this patient by delivering the foetus by caesarean section. From the systemic review a total of 37 percent of the 43 patients studied had a normal vaginal delivery, while 47 percent required caesarean section (1). If the patient's condition worsens, regardless of gestational age, an emergency delivery is recommended, according to this study. According to the review, 35% of cases result in premature labour, as was observed in this case (1). If the gestational age is less than 32 weeks, it is vital to administer prenatal corticosteroids for lung maturation and magnesium sulphate for neuroprotection (12). In the case at hand, Atosiban was given as a tocolytic.

Instances that had delivery at the same time as the repair of the diaphragmatic hernia defect and cases that had the repair of the congenital diaphragmatic hernia then delayed delivery were both included in the systemic review (1). Simultaneous delivery was performed in our case because the diagnosis was made intraoperatively and the reason for emergent caesarean section was the patient's deteriorating condition. Misdiagnosis or a delay in treatment were found to be linked to a high rate of mortality from herniated organ complications such as intestinal obstruction, strangulation and gangrene (13).

In this case, the left hemithorax required decompression with a nasogastric tube after the initial impression of acute pancreatitis. A hemithorax on a chest x-ray may prompt a health care professional to place a chest tube (13). In a case report reported by Katageri et al, the omentum herniated via the intercostal drain after the chest tube was inserted. As a result, before inserting an intercostal drain, further imaging should be done (14).

Conclusion

Maternal congenital diaphragmatic hernia diagnosed during pregnancy is rare. Performing further diagnostic imaging such as CT or MRI Thorax and abdomen and even exploratory laparotomy should be considered if the patient was not improving with conservative treatment, or if becoming vitally and clinically unstable. Misdiagnosis and delay in management of symptomatic maternal diaphragmatic hernia can lead to mortality. Multidisciplinary care with involvement of obstetricians, general and thoracic surgeons are required in diagnosis and management.

Ethical considerations: ethical approval for the study was obtained from the research ethics committee of King Abdulaziz University Hospital (KAUH), Jeddah, Saudi Arabia.

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Conflict of interest
The authors declare that there is no conflict of interest.

Informed Consent
Consent to report this case and images were obtained from the patient

References

1. Choi JY, Yang SS, Lee JH, Roh HJ, Ahn JW, Kim JS, et al. Maternal Bochdalek Hernia during Pregnancy: A Systematic Review of Case Reports. Diagnostics (Basel) 2021;11(7):1261-1283.
2. Tovar JA. Congenital diaphragmatic hernia. Orphanet J Rare Dis 2012; 3;7:1-16.
3. Longoni M, Pober BR, High FA. Congenital Diaphragmatic Hernia Overview. 2006 Feb 1 [Updated 2020 Nov 5]. In: Adam MP, Ardinger HH, Pagon RA, et al., editors. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2022. Available from: https://www.ncbi.nlm.nih.gov/books/NBK1359/
4. Hamid KS, Rai SS, Rodriguez JA. Symptomatic Bochdalek hernia in an adult. JSLS. 2010;14(2):279-281.
5. Yetkinel S, Pekşen Ç, Kızıltan R. Symptomatic Bochdalek Hernia in Pregnancy: A Rare Case Report. Case Rep Surg 2017;2017:2862149.
6. Reddy M, Kroushev A, Palmer K. Undiagnosed maternal diaphragmatic hernia - a management dilemma. BMC Pregnancy Childbirth 2018;15;18(1):237-242.
7. Zou YZ, Yang JP, Zhou XJ, Li K, Li XM, Song CH. Bochdalek hernia masquerading as severe acute pancreatitis during the third trimester of pregnancy: A case report. World J Clin Cases 2020;8(19):4660-4666.
8. Islah MA, Jiffre D. A rare case of incarcerated bochdalek diaphragmatic hernia in a pregnant lady. Med J Malaysia 2010;65(1):75-76.
9. Zou YZ, Yang JP, Zhou XJ, Li K, Li XM, Song CH. Bochdalek hernia masquerading as severe acute pancreatitis during the third trimester of pregnancy: A case report. World J Clin Cases 2020;8(19):4660-4666.
10. Schwartz T, Gough-Fibkins S, Santini R, Kopylov D. Abdominal CT Scan Findings of Decompression Sickness: A Case Report. J Radiol Case Rep 2018;12(10):17-23.
11. Chen Y, Hou Q, Zhang Z, Zhang J, Xi M. Diaphragmatic hernia during pregnancy: a case report with a review of the literature from the past 50 years. J Obstet Gynaecol Res 2011;37(7):709-714.
12. Tsakiridis I, Mamopoulos A, Athanasiadis A, Dagklis T. Antenatal Corticosteroids and Magnesium Sulfate for Improved Preterm Neonatal Outcomes: A Review of Guidelines. Obstet Gynecol Surv 2020;75(5):298-307.
13. Katageri G, Vishwanath G, Mallapur A, Teli B, Suhas BS. Maternal Congenital Diaphragmatic Hernia First Manifesting in Pregnancy: A Case Report. J Obstet Gynaecol India 2021;71(1):82-84.
14. Kwiatt M, Tarbox A, Seamon MJ, Swaroop M, Cipolla J, Allen C, Hallenbeck S, Davido HT, Lindsey DE, Doraiswamy VA, Galwankar S, Tulman D, Latchana N, Papadimos TJ, Cook CH, Stawicki SP. Thoracostomy tubes: A comprehensive review of complications and related topics. Int J Crit Illn Inj Sci 2014;4(2):143-155.