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Chicken pox virus

Parents' perception and understanding of Non-steroidal anti-inflammatory use in children with Chicken Pox infection and its associated risks

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This is the second issue this year that is rich with papers from the Region including Saudi Arabia, Yemen, Qatar, Turkey , Lebanon , Jordan, Iraq and the United Kingdom. It cover wide area of concern to primary care.

Algamdi K et al; assessed the awareness level and addressed various factors that could encourage or discourage patients to utilize PHC in Al-Madinah. More than 80% of the respondents were aware of the existence of a PHCC in their district. Nonetheless, 30.7% of them never utilized PHC services. The authors concluded that regular assessment of patient satisfaction and patterns of utilization is important to promote the quality of PHC services. Also, to maximize PHC utilization, collaborative efforts from PHC staff, the government, and the Al-Madinah community are needed.

Assiri E.H et al; carried a A cross–sectional study in that included a sample of 402 elderly participants aged above 65 years who attended primary health care (PHC) centers. To assess the prevalence and determinants of falls among people aged 65 years or more. Multivariate logistic regression analysis revealed that working elderly persons were less likely to have falls compared to retired persons. Patients with cardiac disease were at significant risk. The authors concluded that falls constitute a common health problem affecting more than half of elderly people attending PHC centers in Abha City, despite the fact that it can be easily prevented.

A number of papers dealt with metabolic issues. Anwarulhaq M & Hussain M.S assessed the postpartum follow up of GDM patients. They did an initial audit at a local health practice in Scotland, UK. Based on the initial findings, several changes were proposed, for appropriate follow-up of GDM patients postnatally. Once the necessary changes were implemented, it led to successful identification and management of all GDM patients in primary care after discharge from hospital. In a second study Hussain M.S did a prospective study was carried out in 10 patients with type 2 diabetes mellitus (T2DM), registered at a local primary health care practice in South Lanarkshire, Scotland, to see if motivational interviewing (MI) and improving health literacy can help in building insight into self-management of chronic conditions like T2DM. The author concluded that Doctors need good communication skills to be able to share the complex medical information in a clear manageable way, which should be tailored according to individual patient needs and skills. Whereas Solaiman A.S et al; carried a descriptive cross-sectional study to assess prevalence and identify patterns of CAM utilization among patients with T2DM. the authors concluded that nearly 3 out of each four diabetic patients use at least one type of CAM, especially females with a recent diagnosis. Herbs are the most frequently used CAM at initial diagnosis of DM.

Saeed Tayeb M.M.S et al, conducted a retrospective chart review to identify common allergic diseases associated with CMP sensitization. Data from 83 patients in Jeddah were included in the study. SIgE food allergy tests for 83 patients were evaluated. Gender distribution was 51 females (61.5%) and 32 males (38.5%). The authors concluded that Alpha lactalbumin and casein, followed by milk are the most common sensitizers and also cause the most severe allergic reactions. Atopic dermatitis and allergic rhinosinusitis, followed by asthma are the most common clinical allergic diseases associated with CMP sensitization. Cashew, peanut, wheat and egg were the most common food sensitizers associated with CMP sensitization. It should be noted that the most severe food sensitizer of all associated with CMP sensitization is cashew.

In two papers the issues of health of school teachers was eluded to. Al-Hazmi, A.A et al, did a cross-sectional study to assess prevalence of migraine, its patterns and associated factors among male secondary school teachers. The authors concluded that prevalence of migraine headache among male secondary school teachers is high,

mainly felt by as throbbing, at the occipital region. Whereas Alharbi T.A et al did cross-sectional study design, 400 male secondary school teachers to explore prevalence and risk factors of musculoskeletal pain among male secondary school teachers. The authors concluded that prevalence of musculoskeletal pain among secondary school male teachers is high, mainly affecting the neck, shoulder, low back and the lower limbs.

A number of papers looked at the issue of obesity. Al-Sadiq W.A et al, carried a cross sectional study to assess prevalence of obesity among PHC physicians and to explore their attitudes and practices regarding obesity management. The authors concluded that prevalence of overweight and obesity among PHC physicians in is quite high, especially among male physicians. Whereas Almalki A.Q et al; attempt to estimate the prevalence and correlates of obesity among psychiatric patients in Abha city. Normal weight was recorded among 37.2% of the sample and 27.6% of the patients had overweight while 35.2% were obese. The authors concluded that obesity is significantly associated with depression and other psychiatric diseases, while negatively associated with anxiety and obsessive convulsive disorder (OCD).

Alshaikh A.A did a cross-sectional study design was followed to include 101 Primary Health Care physicians in to determine knowledge, attitude and practice of PHC physicians regarding common psychiatric disorders Most PHC physicians (86.1%) have unsatisfactory knowledge about psychiatric disorders. The authors concluded that knowledge of PHC physicians about psychiatric disorders is unsatisfactory, with several knowledge gaps. Their attitude toward management of psychiatric patients is mainly positive. Although all PHC physicians diagnose psychiatric diseases, they mostly refer their patients to a specialist.

Mohammed A. Alqahtani , et al, did a descriptive cross-sectional survey to estimate prevalence, types and correlates of physical and verbal assault among medical staff working in emergency departments in Abha City. The authors concluded that the study documented the existence of workplace violence among emergency medical staff in Abha. Different types of physical and psychological violence for all categories were recorded.

Hussain et al, conducted a qualitative cross-sectional survey by undertaking semi-structured interviews with open-ended questionnaire with 20 randomly selected parents whose children were diagnosed with chicken pox infection over 3 months period, within the primary health care setting. The Main objective was to find out if parents were aware of the associated risks of NSAIDs use. None of the parents were aware of the associated risks of skin infection and necrotising fasciitis with NSAID use. Hence, there is need to develop parental educational programs to improve their understanding in the management of fever during chicken pox illness.

Noori F.M et al did a case control study include 100 patient, (47) normotensive compared with (53) hypertensive pregnant lady. The study aimed to find the relation between thyroid function and gestational hypertension. Most of those with blood group (-O) had hypertension 3(75%), followed by those with blood group (-A) 2(66.7). the authors concluded. Gestational hypertension was significantly associated with increased levels of TSH, and decreased FT3 levels, and non- significantly with increased S.FT4.

Abedalrahman, S.K et al did a Retrospective case control study, with a randomly selected 147 breast cancer cases compared with 161 non breast cancer cases. The study aimed to study the effect of reproductive factors as breast cancer risk factor. The authors concluded that
Age at 1st full term pregnancy was important factor affecting breast cancer risk, parity have a dual effect in in breast cancer risk.

Abduawahid, M.K.H et al ; did a cross sectional survey conducted in period from 1st September-30th October 2017. They followed a modified form of the WHO hand hygiene knowledge questionnaire for Healthcare workers that included 35 items was sent to 160 health care workers. This study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices, which may play a very important role in increasing hand hygiene compliance.

Helvaci, M.R ET AL tried to understand the significance of high density lipoproteins (HDL) in the metabolic syndrome. The authors concluded that Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis in the metabolic syndrome. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD were all deteriorated parallel to the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Whereas the mean HDL values did't show any significant change parallel to the above parameters in none of the groups.

Alfayez N.D et al, report a case was a spontaneous uterine rupture at 13 weeks of gestation in a 28-year-old female. The initial impression was a rupture ectopic pregnancy with hemoperitoneum. An emergency laparotomy revealed a rupture uterus and the presence of large amount of blood in the abdominal cavity. Clinical signs of uterine rupture in early pregnancy are non-specific and should be distinguished from acute abdominal emergencies.

Mohsen A.A.H did a retrospective descriptive study of patients suffered from knee osteoarthritis and treated by the use of intra-articular injection of hyaluronic acid. The

Parents' perception and understanding of Non-steroidal anti-inflammatory use in children with Chicken Pox infection and its associated risks

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Abstract

Background: Chicken pox is a common childhood infection. Children initially present with fever followed by a vesicular rash after 2 to 3 days. Nonsteroidal anti-inflammatory medications (NSAIDs) like Nurofen or Ibuprofen are commonly available over the counter antipyretic medications and are used initially in the management of fever by parents. The objective of this study and literature review is to gauge the knowledge and understanding of parents about using NSAIDs during chicken pox infection and the associated health risks.

Methods: The study aimed to conduct a qualitative cross-sectional survey by undertaking semi-structured interviews with open-ended questionnaire with 20 randomly selected parents whose children were diagnosed with chicken pox infection over a 3 month period, within the primary health care setting. The main objective was to find out if parents were aware of the associated risks of NSAIDs use.

Literature Review: A short literature review was conducted to gain further evidence about the use of NSAIDs medication in children diagnosed with chicken pox infection detailing the associated health risks and complications.

Results: Out of the total 20 parents interviewed; none were aware of NSAID associated risks during a chicken pox illness. 40% of parents (n=8) used both paracetamol as well as ibuprofen as the initial antipyretic medication whilst 60% of parents (n=12) used paracetamol alone.

Conclusion: There was a clear lack of understanding of the parents about the choice of antipyretic medication in the management of fever in chicken pox infection. None of the parents were aware of the associated risks of skin infection and necrotising fasciitis with NSAID use. Hence, there is need to develop parental educational programs to improve their understanding in the management of fever during chicken pox illness.

Key words: parent perception, chicken pox, NSAIDs

Introduction

According to the Centre of Disease Control and Prevention (CDC – 2019), chicken pox is a contagious disease. It is a viral disease caused by varicella-zoster virus (VZV). It leads to the development of itchy and blister-like rash. The rash generally appears over the chest, back of the body and face and then spreads throughout the body. The average incubation period of chicken pox post exposure from the virus is 2 to 3 weeks. Children, adolescents, pregnant women and young adults and people who are immune-compromised are vulnerable to getting infected with this painful viral infection. The best-way to prevent chicken pox is vaccination with chicken pox vaccine (1).

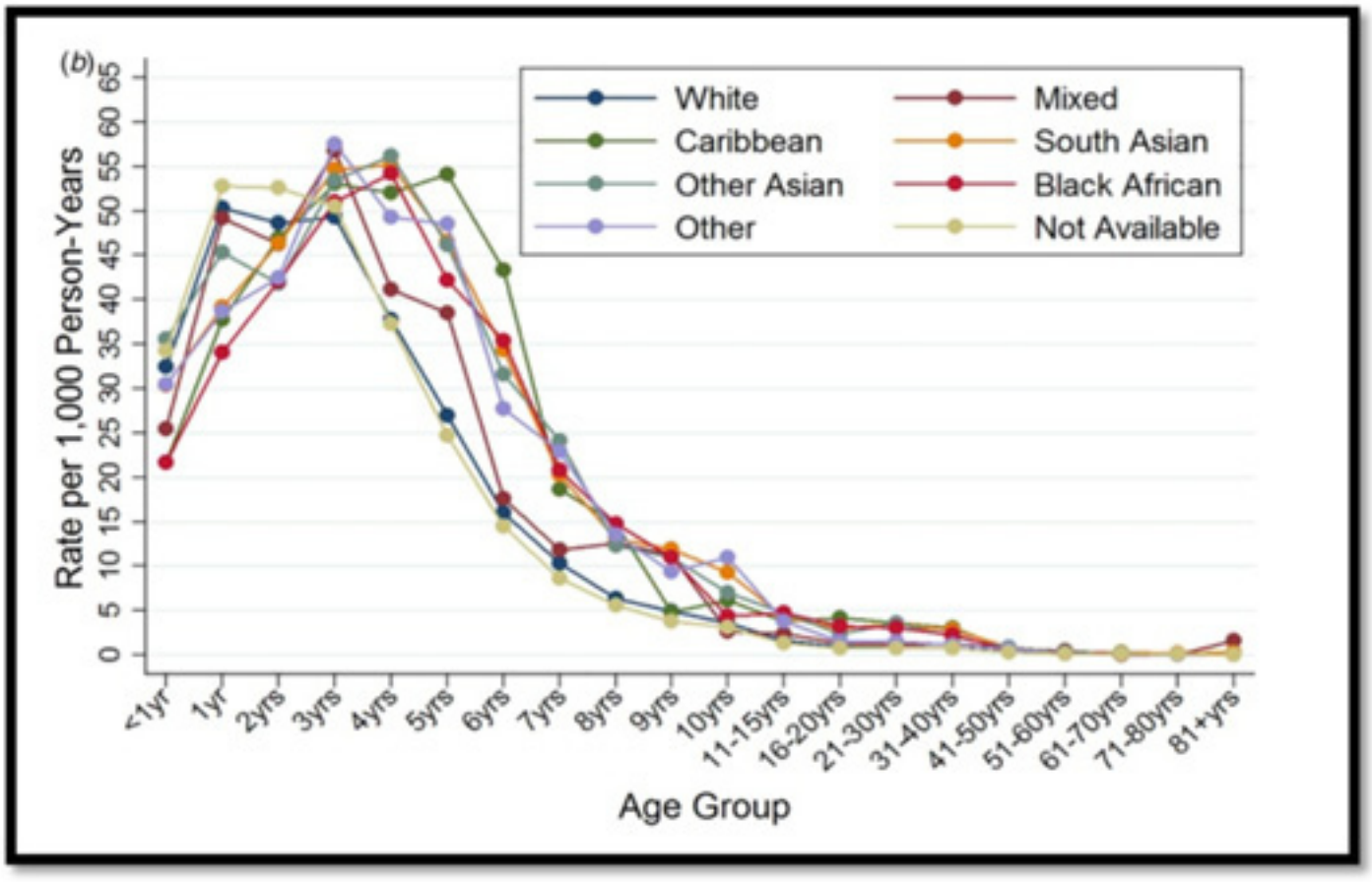
In the United Kingdom (UK), chicken pox is common during childhood. Approximately three-quarters of the parents report the history of chicken pox in their children who are below the age of 5 years (2). According to Walker et al. (2017), the age specific consultation rate of chicken pox among the various ethnic groups in UK highlights that the highest reported cases of chicken pox are below 6 years of age (Figure 1) (3). CDC reported that this highly contagious disease affects 80% of the population by age in the USA, Japan, UK and the main victims are below 10 years. In India and in South East Asia the conditions are different; the main victims include people between 20 to 30 years (1).

Boyd et al. (2017) reported although the mortality rate of chicken pox is low among children, the rate of incidence of chicken pox is high along with high morbidity in the USA and UK. UK encounters 25 deaths per year and the USA encounters 150 deaths per year (4).

Literature review and Evidence

The common practice among parents for the effective management of pain and fever arising due to chicken pox, is the administration of antipyretics such as Paracetamol and Ibuprofen. These analgesics are given during the early days of the disease as these two medications are two of the most common over the counter (OTC) medications available in the majority of countries (5). Neurofen and Ibuprofen belong to the same family of medicine collectively known as non-steroidal anti-inflammatory drugs (NSAIDs). A case-controlled study designed by Mikaeloff et al. (2008) on the population of UK primary healthcare service users for a period of 2 months, highlighted that use of NSAIDs in children during an active VZV infection leads to the development of cellulitis infection caused by Staphylococcus along with an increased risk of Necrotising Fasciitis (NF). However, the use of paracetamol did not show any significant health risk to the children in comparison to NSAIDs(6).

Figure 1: Taken from Walker et al (2017) - Consultation rate of Varicella in UK among various ethnic groups from 2006 to 2012 (3)



The study conducted by Mikaeloff et al. (2008) was supported by two other epidemiological studies;a cohort study conducted by Stone et al. (2018) (7) and a case control study conducted by Zerr et al. (1999) (8). All these studies showed the same trend. However, the study conducted by Mikaeloff et al. (2008) (6) is limited due to possible misclassification of patients as many patients might have taken over the counter NSAIDs without their GP's knowledge. Moreover, there was under reporting of complications possibly if patients ending up in hospital emergency instead of at general practice and were thus coded differently. Therefore, any results found by this study could possibly be considered as a lower bound estimate of the effect.

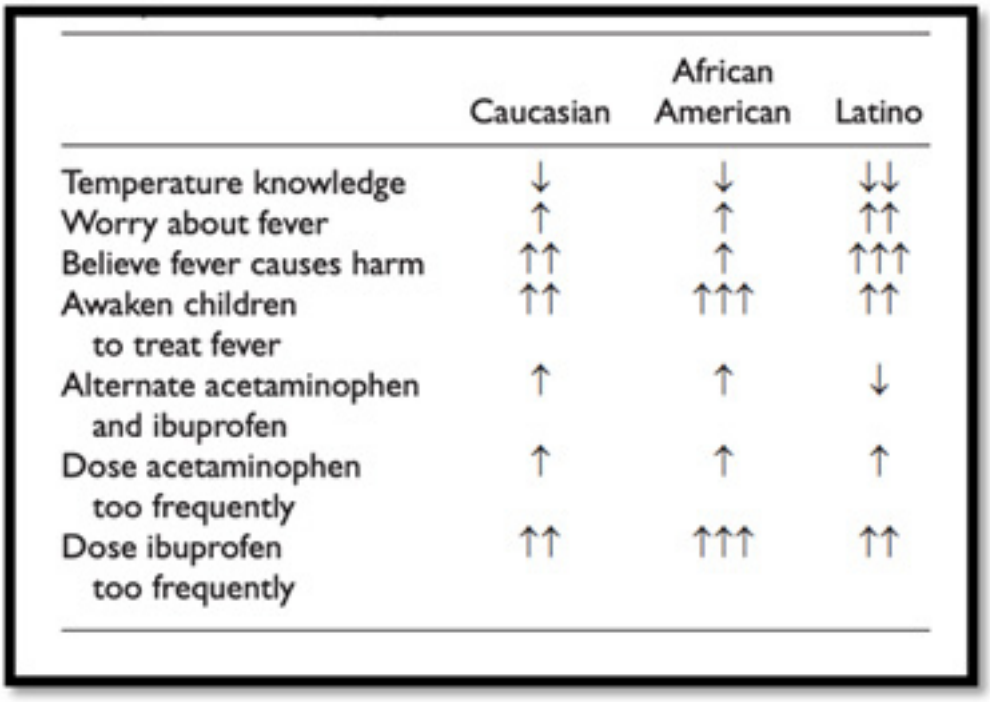
A case report was published in British Journal of Medicine (BMJ) in May 2018 describing a 4-year-old girl who presented to the emergency department after three days into her chicken pox illness with a rapidly progressive Necrotising Fasciitis (NF) requiring antibiotics and surgical debridement followed by a skin graft and a prolonged hospital stay. She had received two doses of Ibuprofen in the community prior to her presentation. This case report also emphasised caution about not using NSAIDs at all or using them cautiously in primary varicella infection as they have been associated with development of Necrotising Fasciitis (NF) (9).

So, what does all this mean for the parents? If a child has chicken pox and is given Ibuprofen or another NSAID, there is a risk of developing certain complications. Thus Mikaeloff et al. (2008) (6) stated that it would be better to treat them only when their fever is making them uncomfortable or upset by administering paracetamol. However, there is a gap in parent perception and understanding about the management of fever and pain symptoms of chicken pox. A cross-sectional survey conducted by Cohee et al. (2010) over 487 parents who had their children enrolled at two different urban based paediatric clinics in Baltimore, Maryland highlighted the need for improving the understanding and education of parents about perception and management of fever. It showed that African American parents mainly have difficulty with appropriate dosing of antipyretics while Caucasian and Latino parents experience difficulties in discriminating between normal temperature and fever temperature, thus showing "fever phobia". Interestingly, regardless of the ethnicity, most parents treat temperatures in the normal range with medicines and also dose antipyretics more frequently (Figure 2)(10).

However, the cross-sectional survey by Cohee et al. (2010) demonstrated a few limitations including the confusion created between temperature calculation method between Celsius and Fahrenheit by parents, likely creating misinterpretation and poor understanding of normal temperature range, creating "fever phobia" as mentioned. Also, the Latino group was least to use age appropriate method of checking temperatures i.e rectally ≤ 3 years age and orally ≥ 3 years of age. Only half of parents could identify temperature in fever range and treat appropriately. On a positive note, the survey demonstrated the necessity of improving education of families about proper fever management and the correct dosing of antipyretics (10).

Walsh et al. (2007) conducted a qualitative semi-structured interview with fifteen metropolitan parents in Queensland Australia. The aim of the study was to identify the influences on parents' fever management, beliefs and experiences. The results were very interesting and showed antipyretics were the first line of treatment by many parents irrespective of the temperature. Some preferred specific antipyretics like Ibuprofen as first choice and some showed overdosing as well when using in combination with other antipyretics. Parents' management of fever and practices were

Figure 2: Taken from Cohee et al (2010) - Ethnical differences in parental perceptions and management of fever (10)



	Caucasian	African American	Latino
Temperature knowledge	↓	↓	↓↓
Worry about fever	↑	↑	↑↑
Believe fever causes harm	↑↑	↑	↑↑↑
Awaken children to treat fever	↑↑	↑↑↑	↑↑
Alternate acetaminophen and ibuprofen	↑	↑	↓
Dose acetaminophen too frequently	↑	↑	↑
Dose ibuprofen too frequently	↑↑	↑↑↑	↑↑

greatly influenced by their beliefs, knowledge, source of information, and number of children in the family. Although this study achieved its target of finding the objectives and important influences were identified, the limitations were, it was not generalised, the parents who participated were well educated and were from metropolitan areas. So, a more generalised study with bigger sample size is required to confirm these findings (11).

Materials and methods

1 Study Design:
A cross-sectional study was carried out in a primary health care setting in Doha, Qatar. Data collection was done over a period of 12 weeks from June 2019 to September 2019. The idea was to assess the level of perception of parents of use of antipyretics especially neurofen and Ibuprofen (NSAIDs) in chickenpox infection and if the parents were aware of associated risks of use of NSAIDs during a chickenpox infection.

2 Study Population:
A total number of 20 parents were randomly selected who presented with their children, having a confirmed diagnosis of chicken pox infection, either made in primary care or in an emergency department. All children were between the age range of 5 to 15 years. This included parents who presented for the first time with a child having chicken pox and also those who have had other children with chicken pox. According to Faber and Fonseca (2014), 20 is a poor sample size. A large sample size helps to gain generalisability of the data and helps to detect clinically relevant differences. Using a small sample size increases the chance of assuming true as a false premise (12). Thus, selection of a small sample size of 20 can be considered as one of the limitations of this study, however, small sample size was selected taking into consideration the timespan and local population for which the study was conducted.

3 Study Instrument:
Data collection was done by conducting semi-structured interviews with open-ended questionnaires to judge the level of understanding and perception of parents. The questions in general focused on the most commonly used OTC antipyretic medicine by parents in order to manage the symptoms of fever, if they preferred NSAIDS or Paracetamol in fever management, if they used NSAIDs during chicken pox and if they were aware of any associated risks of using NSAIDs in chicken pox.

Semi-structured interviews enabled the researchers to encourage conversations with the interviewee and thereby giving participants the flexibility to elaborate on the given information and why they thought that information was relevant to the research (13). Also, semi-structured interviews help the researchers to enjoy freedom to navigate during the conducting of the interviews and thus allowing the participants to lead the interview towards the direction of their own interests and respective personal constructs (14).

4 Ethical Considerations:
Researchers obtained ethical approval from those in charge of respective health centers as per local policy.

Results

The study involved total 20 parents, out of whom 14 presented for the first time with a child having chicken pox. The remaining 6 parents had other children diagnosed with chicken pox before (Figure 3). Out of the total of 20, 8 parents had a single child and 12 were had multiple children at home. All children who attended with chicken pox during the study were between age range of 5 to 15 years with the mean age of 8.7 years. Interestingly, none (0%) of the 20 parents were aware of any potential risks of NSAIDs use during chicken pox illness, including those 6 parents who had prior experience of managing other children at home with chicken pox. Out of the 20 parents, 8 parents (40%) used both Paracetamol and Ibuprofen for the initial management of fever, while the remaining 12 (60%) used only paracetamol as an antipyretic, but none (0%) were aware of the need to avoid NSAIDs in chicken pox infection and its associated risks.

Figure 3: Graph showing comparison of parents with first experience with chicken pox vs parents with previous experience of chicken pox with other child

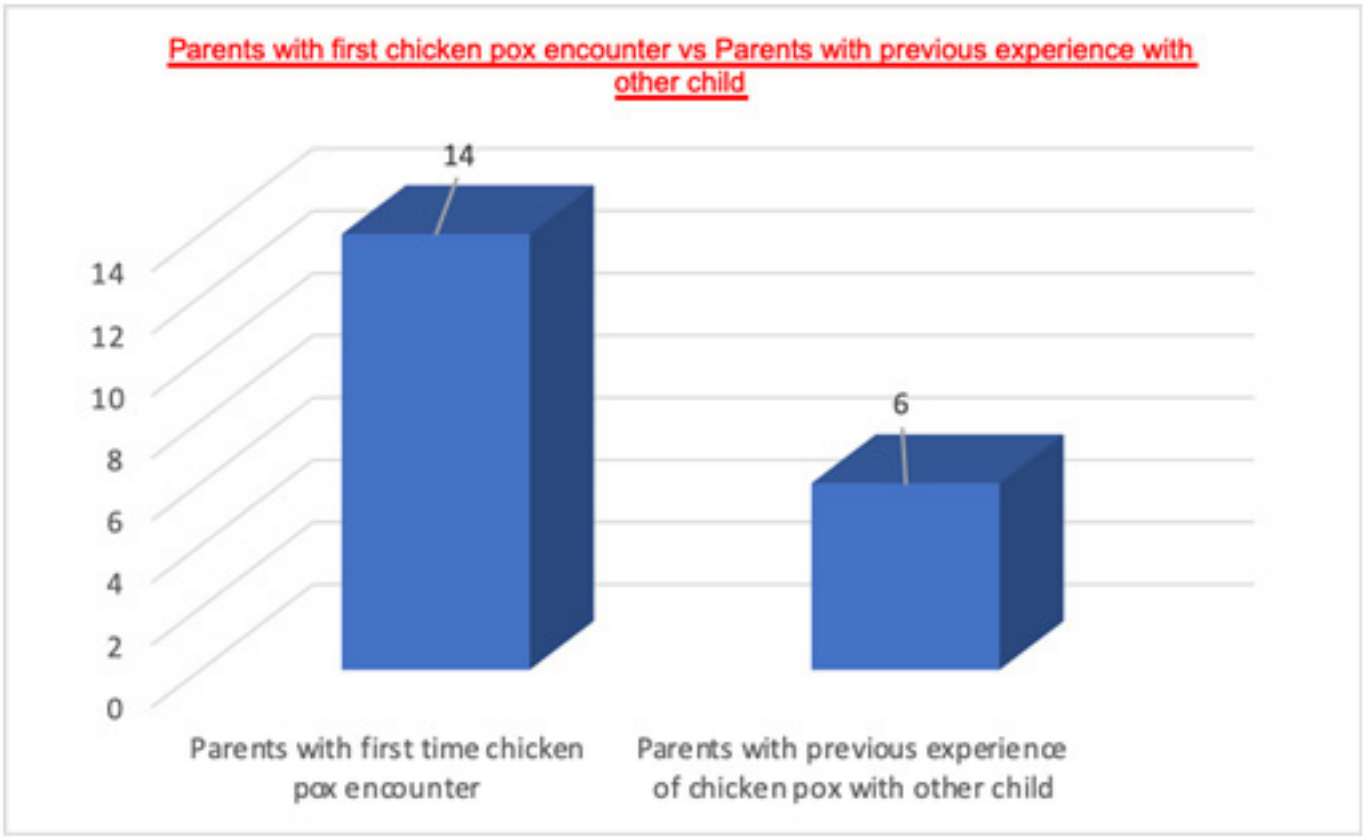
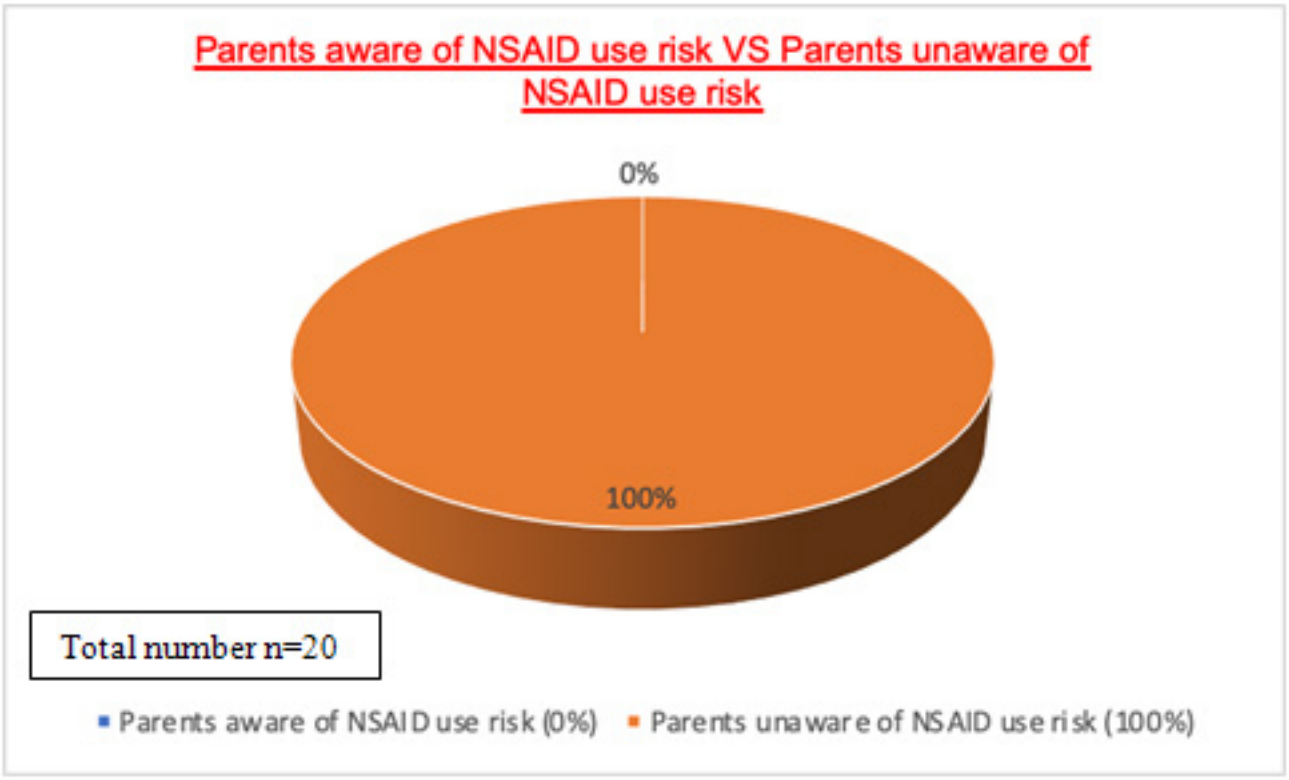


Figure 4: Graph showing comparison of parents aware of NSAID use risk during chicken pox illness VS parents unaware of NSAID use risk



Conclusion

In light of the detailed relevant literature review, it is quite evident that use of Neurofen or any other NSAIDs in children with chicken pox infection increases the risk of skin infections including Necrotising Fasciitis and secondary bacterial infections. Also, the conducted study elaborates poor understanding of parents about use of NSAIDs during chicken pox illness. Thus, overall it can be said that the clear understanding of the parental perception about the management of fever in chicken pox with medication and other interventions is lacking. Parents in general should be made more aware to use Paracetamol as the initial choice of antipyretic medication for any febrile illness as in the initial 2-3 days it is not evident that febrile illness is due to chicken pox or any other cause. Also, once the clinical diagnosis of chicken pox is confirmed, NSAIDs should be completely avoided. There should be more health education about use of OTC antipyretics and their consequences. The health education can be provided either by direct face to face doctor patient encounters, through pharmacies when parents buy OTC medications or through patient information leaflets.

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References

1- Chickenpox | For Healthcare Professionals | Varicella | CDC [WWW Document], 2019. URL https://www.cdc.gov/chickenpox/hcp/index.html (accessed 3.2.19).
2- Amirthalingam, G. and Ramsay, M., 2016. Should the UK introduce a universal childhood varicella vaccination program?
3- Walker, J.L., Andrews, N.J., Mathur, R., Smeeth, L. and Thomas, S.L., 2017. Trends in the burden of varicella in UK general practice. Epidemiology & Infection, 145(13), pp.2678-2682.
4- Boyd, G., Heaton, P.A., Wilkinson, R. and Paul, S.P., 2017. Nursing management of childhood chickenpox infection. Emergency nurse: the journal of the RCN Accident and Emergency Nursing Association, 25(8), pp.32-41.
5- Durand, L., Sachs, P., Lemaitre, C., Lorrot, M., Bassehila, J., Bourdon, O. and Prot-Labarthe, S., 2015. NSAIDs in paediatrics: caution with varicella!. International journal of clinical pharmacy, 37(6), pp.975-977.
6- Mikaeloff, Y., Kezouh, A. and Suissa, S., 2008. Nonsteroidal anti-inflammatory drug use and the risk of severe skin and soft tissue complications in patients with varicella or zoster disease. British journal of clinical pharmacology, 65(2), pp.203-209.
7- Stone, K., Tackley, E and Weir, S., 2018. BET 2: NSAIs and chickenpox. Emerg Med J 35, 66–68.
8- Zerr DM, Alexander ER, Duchin JS, Koutsky LA, Rubens CE. A case-control study of necrotizing fasciitis during primary varicella. Pediatrics. 1999 Apr 1;103(4):783-90.
9- Darmasseelane, K., Banks, T. and Rjabova, T., 2018. Necrotising fasciitis as a complication of primary varicella infection in an immunocompetent child. BMJ case reports, 2018, pp.bcr-2018.
10- Cohee, L.M., Crocetti, M.T., Serwint, J.R., Sabath, B. and Kapoor, S., 2010. Ethnic differences in parental perceptions and management of childhood fever. Clinical pediatrics, 49(3), pp.221-227.
11- Walsh A, Edwards H, Fraser J. Influences on parents' fever management: beliefs, experiences and information sources. Journal of clinical nursing. 2007 Dec;16(12):2331-40.
12- Faber, J. and Fonseca, L.M., 2014. How sample size influences research outcomes. Dental press journal of orthodontics, 19(4), pp.27-29.
13- Hung-Wen, L., 2007. Factors that influence expatriate failure: An interview study. International Journal of Management, 24(3), p.403.
14- Firmin, M.W. and Gilson, K.M., 2007. Driven and No Regrets: A Qualitative Analysis of Students Earning Baccalaureate Degrees in Three Years. Educational Research Quarterly, 31(2), pp.30-43.

Prevalence and patterns of complementary and alternative medicine practices among type 2 diabetics

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Abstract

Background: Diabetes mellitus (DM) is a growing global health concern. The conventional therapy options for type 2 diabetes mellitus (T2DM) include life style management and medical nutrition therapy, oral glucose lowering drugs, and injections of insulin. Complementary and alternative medicine (CAM) is neither widely taught in medical schools nor widely practiced in hospitals. Nevertheless, there is worldwide increase in the use of CAM.

Aim: To assess prevalence and identify patterns of CAM utilization among patients with T2DM in Abha City, Saudi Arabia.

Methodology: A descriptive cross-sectional study included a sample of 300 T2DM patients who are registered at the Diabetes Center in Abha City, Saudi Arabia, who were directly interviewed using a pre-structured questionnaire.

Results: Participants' age ranged from 24 to 80 years (Mean±SD: 53.1±14.9 years). CAM utilization was recorded among 78% of the patients. Herbs were the most recorded item used by the patients (53.4%) followed by dietary supplements (52.1%), honey (33.3%), special food (29.1%), and Roqia (Quran) (15.4%).

Conclusions & recommendations: Nearly 3 out of each four diabetic patients use at least one type of CAM, especially females with a recent diagnosis. Herbs are the most frequently used CAM at initial diagnosis of DM.

Key words: Complementary and alternative medicine, Type 2 diabetes, Diabetes control.

Background

Diabetes mellitus (DM) is a growing global health concern. The highest prevalence of DM occurs in the Middle East and North Africa due to rapid economic development, urbanization and changes in lifestyle patterns in the region. It is the most challenging health problem facing the Kingdom of Saudi Arabia (1) .

The conventional therapy options for type 2 diabetes mellitus (T2DM) include life style management, exercise, weight control and medical nutrition therapy, oral glucose lowering drugs, and injections of insulin (2). Pharmacological treatment for T2DM has its own drawbacks, ranging from development of resistance and adverse effects to lack of responsiveness in a large segment of the patient population (3).

Complementary and alternative medicine (CAM) is neither widely taught in medical schools nor widely practiced in hospitals. Nevertheless, there is worldwide increase in the use of CAM. Generally, most people who use CAM do so in addition to, rather than in place of conventional medical treatment, although some do not receive any concurrent conventional medical care (2).

For centuries, people have been using traditional means for treating ailments, and continued to use them alongside modern medicine. Despite all the marvelous advancements in modern medicine, CAM has always been practiced. It refers to health practices, approaches, knowledge and beliefs incorporating plant-, animal- and mineral-based medicines, spiritual therapies, manual techniques and exercises, applied singly or in combination, to treat, diagnose and prevent illnesses or maintain well-being (4).

The National Center for Complementary and Integrative Health in the USA defined Complementary and Alternative Medicine (CAM) as a group of diverse medical and healthcare systems, practices and products that are not generally considered to be part of conventional medicine. These definitions are often blurred, and the list of what is considered to be CAM changes as therapies that are proven to be safe and effective are adopted into conventional medicine (5). More than 80% of the developing world's population still depends on the complementary and alternative systems of medicine, while about half of the population in industrialized countries use CAM. It has always been an 'invisible mainstream' within the health care delivery system (6).

The World Health Organization noted that there has been an unprecedented increasing interest in these systems of therapeutics on a global level (7). In the USA, surveys have generally found that individuals who are more likely to use TM/CAM are females, who live in the western states and have a higher socioeconomic status than do nonusers (8). Egede et al. found that among individuals with diabetes, older age and higher educational attainment were independently associated with CAM use (9).

In the Kingdom of Saudi Arabia (KSA), Al-Habeeb noted that clients of TM/CAM are mostly older females, who are particularly weak, misinformed, uneducated and of poor backgrounds suffering both from the 'evil eye' and 'magic', who also present with an array of somatic symptoms, interpersonal conflicts, and alleged misfortunes (10).

Study rationale

Diabetes mellitus is a growing disease worldwide and it is the most challenging health problem facing the KSA (1). CAM was found to be commonly used by diabetics alongside their conventional medications. Nevertheless, there are no studies about prevalence and types of CAM used for management of DM in KSA. Therefore, it is quite important to explore this field (11-13).

Methodology

A descriptive cross-sectional study was conducted in the City of Abha, which is the capital of Aseer Region in KSA, targeting all T2DM patients who are registered at the Diabetes Center in Abha City. A total sample of 300 patients who attended the diabetes center during the period from October to December 2018 were included. Direct interview of patients was conducted using a pre-structured questionnaire, which was developed by the researchers after intensive review of relevant literature. Validation of the questionnaire was done by two consultants of Family Medicine and one consultant of Diabetology. The study tool covered personal characteristics of diabetic patients including age, sex, nationality, occupation, marital status, and educational level. Moreover, CAM use, causes of use, used type within the last year, outcome, and personal satisfaction were included.

After data were collected, revised, and coded, the Statistical Package for Social Sciences (IBM SPSS version 20) was used for data entry and statistical analysis. Statistical analysis was done using two-tailed tests. Frequency and percent were calculated to describe each category for different variables. Chi square test, Monte Carlo exact test or Fisher's Exact test were used to explore the association between patients' characteristics and their CAM utilization. Exact tests were used if there were small frequencies, where chi square was invalid. P-values less than 0.05 were considered statistically significant.

Results

A total sample of 300 type 2 diabetic patients with ages that ranged from 24 to 80 years and a mean age of 53.1±14.9 years were included in the study. Male patients were nearly half of the sample (49.7%) and 88.3% were from an urban region. Illiteracy was recorded among 16% of the patients while 45% were university graduated. About 40% of the sampled patients had dyslipidemia as a chronic health problem and 35% were hypertensive.

CAM utilization was recorded among 78% of the patients (Figure 1). On relating CAM utilization with patients' characteristics (Table 1), it was clear that 85.5% of patients

old and 74% of patients above 60 years old with recorded statistical significance (P=0.032). As for gender, 84.8% of the females used CAM compared to 71.1% of male patients (P=0.004). Patients from rural areas recorded an insignificantly higher utilization rate than urban residence (80% vs. 77.7%). Also illiterate diabetics recorded insignificantly higher utilization of CAM than highly educated patients (81.3% and 80.7%, respectively).

With regard to distribution of CAM utilization according to diabetes data (Table 2), it was clear that recently diagnosed patients (less than 1 year) showed a significantly higher utilization rate than those who had diabetes for 10 years or more (84% vs. 76.9%) (P=0.021). Also 80% of the patients on oral hypoglycemic pills used at least one type of CAM compared to 66.1% of those on insulin therapy (P=0.039). All patients who had renal and neurological complications used CAM compared to 84% of those with ophthalmic complications with statistical significance (P=0.048). As for patients' satisfaction regarding provided medical service, 90.9% of those who were dissatisfied used CAM compared to 71.7% of those who were highly satisfied (P=0.012).

Table 3 shows the details of CAM utilization. Herbs were the most used by the patients (53.4%) followed by dietary supplements (52.1%), honey (33.3%), special food (29.1%), and Roqia (Quran) (15.4%). As for reasons for using CAM, trust in CAM providers was the most recorded reason (39.9%) followed with lack of drug effect (31.8%), and dissatisfied with physician advice (13.3%). About 60% of the patients started receiving CAM with initial diagnosis while 18.8% used it for complications. As for duration of utilization, 30% of the patients used CAM for more than 3 years and 25.7% used it for less than one year. About two thirds (62.4%) of the patients used CAM without consultation of their physicians and this was due to their opinion of 'no need to tell doctors' among 58.6% of the patients.

As for patients' attitude toward CAM utilization and its effect (Table 4), 54.3% of participant patients believed in CAM effectiveness. "To reduce diabetes complications" and "to help in glycemic control" were the most frequently recorded reasons for patients' positive attitude toward CAM (42.9% and 41.7%, respectively). More than one third of patients (35%) felt much improvement, 41.9% of felt somewhat better, 21.7% expressed no benefit, while 1.7% recorded being worse after using CAM. About 71% of diabetics who used CAM were satisfied with its use and 80.8% recorded its low cost.

Finally, on asking about patients' sources of information regarding CAM (Figure 2), the family ranked first (48.3%), followed by friends (33.7%), mass media (25.3%), while medical staff (i.e., physicians and pharmacists) were mentioned by 14% of patients.

Figure 1: CAM utilization among type 2 diabetic patients, Abha, Saudi Arabia

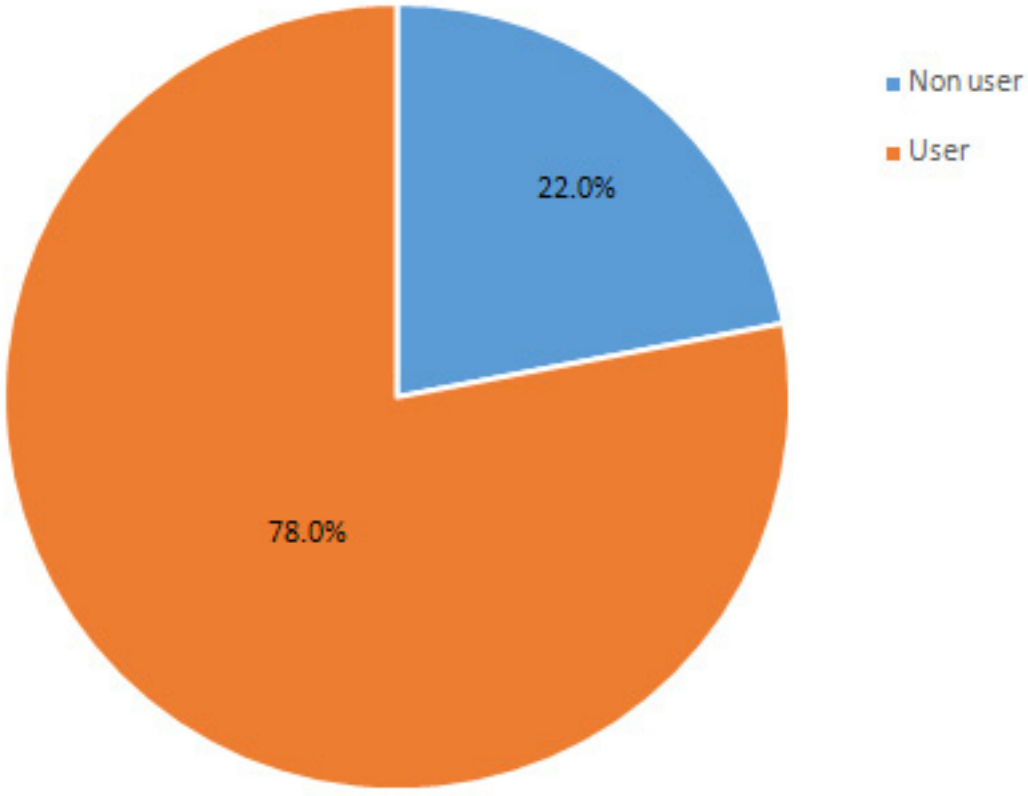

Table 1: Distribution of CAM use by patients' bio-demographic data among type 2 diabetic patients, Abha, Saudi Arabia

Bio-Demographic data		No. (%)	CAM utilization				P
			No		Yes		
			No	%	No	%	
Age in years	< 40 years	55 (18.3)	8	14.5	47	85.5	.032*
	40-	86 (28.7)	13	15.1	73	84.9	
	50-	55 (18.3)	18	32.7	37	67.3	
	60+	104 (34.7)	27	26.0	77	74.0	
Gender	Male	149 (49.7)	43	28.9	106	71.1	.004*
	Female	151 (50.3)	23	15.2	128	84.8	
Residence	Urban	265 (88.3)	59	22.3	206	77.7	.761
	Rural	35 (11.7)	7	20.0	28	80.0	
Nationality	Saudi	274 (91.6)	61	22.3	213	77.7	.794
	Non-Saudi	25 (8.4)	5	20.0	20	80.0	
Marital status	Single	32 (10.7)	4	12.5	28	87.5	.255
	Married	214 (71.3)	47	22.0	167	78.0	
	Divorced / widow	54 (18.0)	15	27.8	39	72.2	
Education	Illiterate	48 (16.0)	9	18.8	39	81.3	.201
	Primary	39 (13.0)	13	33.3	26	66.7	
	Intermediate	32 (10.7)	10	31.3	22	68.8	
	Secondary	46 (15.3)	8	17.4	38	82.6	
	University / more	135 (45.0)	26	19.3	109	80.7	
Chronic diseases	HTN	105 (35.0)	21	20.0	84	80.0	.521
	Dyslipidemia	121 (40.3)	23	19.0	98	81.0	
	Bronchial asthma	24 (8.0)	2	8.3	22	91.7	
	Cardiovascular	22 (7.3)	2	9.1	20	90.9	

* P < 0.05 (significant)

Table 2: Distribution of CAM use by patients' diabetes data among type 2 diabetic patients, Abha, Saudi Arabia

Diabetes data		No (%)	CAM utilization				P
			No		Yes		
			No		No		
Diabetes duration	< 1 year	75 (25.0)	12	16.0	63	84.0	.021*
	1-4	66 (22.0)	9	13.6	57	86.4	
	5-10	94 (31.3)	30	31.9	64	68.1	
	> 10 years	65 (21.7)	15	23.1	50	76.9	
Medication type	Oral pills	190 (63.3)	38	20.0	152	80.0	.039*
	Insulin	59 (19.7)	20	33.9	39	66.1	
	Both	51 (17.0)	8	15.7	43	84.3	
Diabetes complication	Cardiac	32 (10.7)	4	12.5	28	87.5	.048*
	Neurological	14 (4.7)	0	0.0	14	100.0	
	Ophthalmic	63 (21.0)	10	15.9	53	84.1	
	Renal	29 (9.7)	0	0.0	29	100.0	
	Diabetic foot	18 (6.0)	2	11.1	16	88.9	
Last HbA1c	< 7%	79 (26.3)	16	20.3	63	79.7	.076
	7% - 8%	123 (41.0)	20	16.3	103	83.7	
	8% - 11%	74 (24.7)	22	29.7	52	70.3	
	> 11%	24 (8.0)	8	33.3	16	66.7	
Satisfaction with provided health service	Completely satisfied	166 (55.3)	47	28.3	119	71.7	.012*
	Satisfied	123 (41.0)	18	14.6	105	85.4	
	Dissatisfied	11 (3.7)	1	9.1	10	90.9	

* P < 0.05 (significant)

Figure 2: Diabetic patients' source of data regarding CAM, Abha, Saudi Arabia

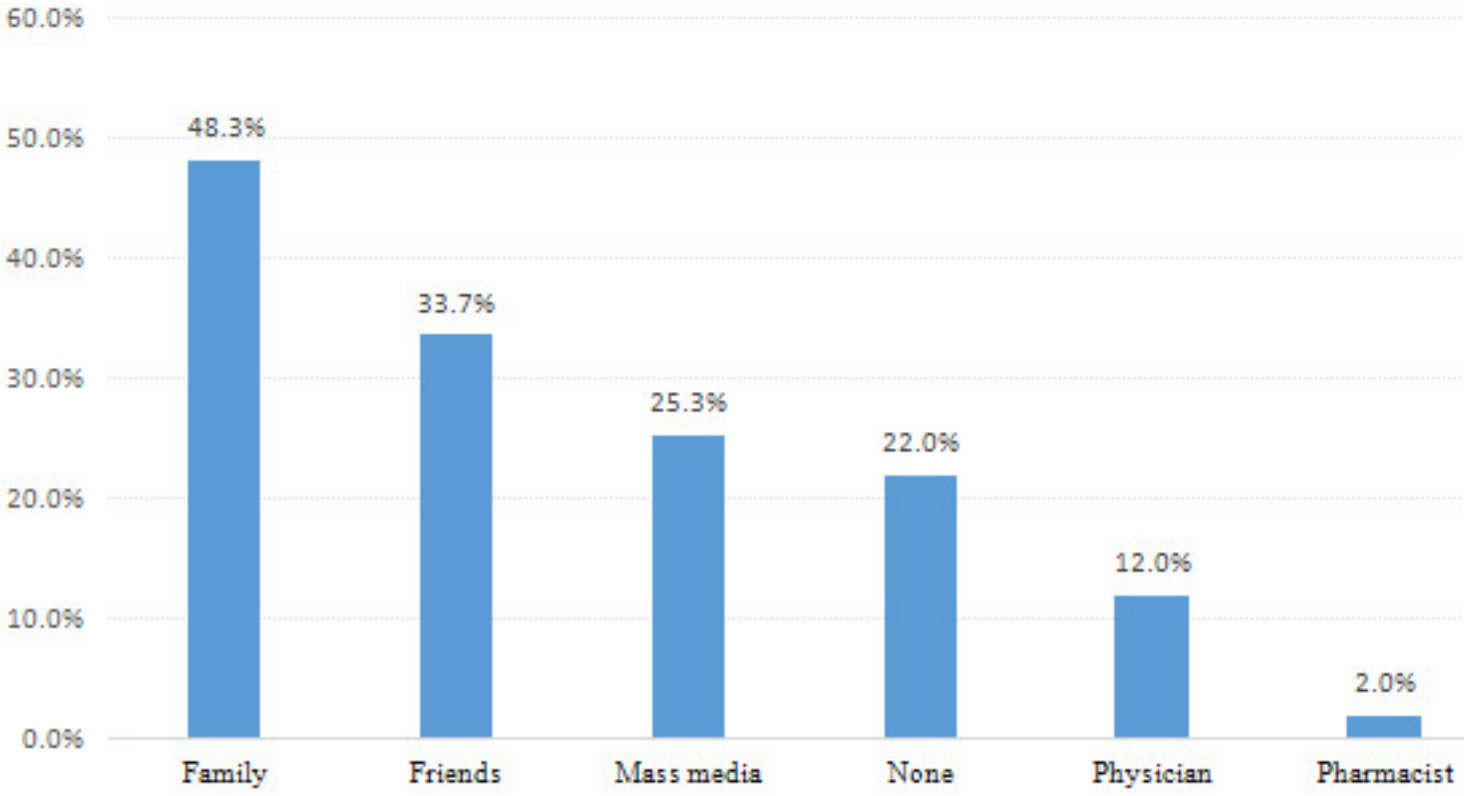

Table 3: CAM utilization data by among type 2 diabetic patients, Abha, Saudi Arabia

CAM utilization data		No (234)	%
Types of CAM used	Herbs	125	53.4%
	Dietary supplements	122	52.1%
	Burning	8	3.4%
	Roqia	36	15.4%
	Honey	78	33.3%
	Message	15	6.4%
	Chinese needles	9	3.8%
	Hijama	19	8.1%
	Special food	68	29.1%
Reason for using CAM	Dissatisfied with physician advice	31	13.3%
	Lack of drugs effect	74	31.8%
	Trust CAM provider	93	39.9%
	Others	35	15.0%
Start using CAM	With DM diagnosis	136	58.1%
	With DM symptoms	54	23.1%
	With complications	44	18.8%
Duration of using CAM	< 1 year	59	25.7%
	1-2	49	21.3%
	2-3	53	23.0%
	> 3 years	69	30.0%
Doctor counseling	Yes	88	37.6%
	No	146	62.4%
If no, why? (n=146)	Not advised by physicians	26	17.9%
	Negative attitude of physician toward CAM	34	23.4%
	No need	85	58.6%

Table 4: Type 2 diabetic patients' attitude toward CAM utilization, Abha, Saudi Arabia

Attitude item		No	%
Believe in CAM benefit for DM	Yes	163	54.3%
	No	137	45.7%
If yes, why? (n=163)	Help in glycemic control	68	41.7%
	Help in weight reduction	48	29.4%
	Reduce DM complications	70	42.9%
	Help in DM cure	20	12.3%
Improvement after using CAM (n=234)	Much better	82	35.0%
	Somewhat better	98	41.9%
	No benefit	50	21.4%
	Worse	4	1.7%
Cost of CAM	High	45	19.2%
	Low	189	80.8%
Satisfaction with CAM	Satisfied	166	70.9%
	Dissatisfied	68	29.1%

Discussion

Apart from the high improvement in management of diabetes, clinical outcomes are still unsatisfactory for some patients, who often turn to non-traditional alternatives. Complementary and alternative medicine (CAM) are health-related methods out of the traditional medicine cycle, with "complementary" meaning added to, and "alternative" meaning used in place of conventional medicine (14). Worldwide, there is a growing number of people with diabetes who seek care for musculoskeletal complaints and overall lifestyle management from natural and/or complementary medicine practitioners (15-17).

The present study found that more than three quarters of diabetic patients used at least one type of complementary or alternative therapy. Herbs and dietary supplements were the most used approaches.

According to the United States 2012 National Health Interview Survey (NHIS), 17.7% of American adults used a dietary supplement added to vitamins and minerals (18). A few studies mapped the use of CAM by diabetics. In a Canadian study of 502 people with diabetes, 44% had over-the-counter supplements with 31% taking alternative medications (19). A United States national survey reported 57% of those with diabetes used CAM in the last year (20).

In Pakistan, Bukhsh et al. (21) recorded that among type 2 diabetic patients, CAM comprised herbs (15.6%), home remedies (9.4%) and homeopathic medicine (6.35%). Strong opinion and pressure by the community and family members, compounded by desires to achieve complete cure, were among the key motivators reported for CAM use in approximately one third of the respondents. These are nearly the same findings of the current study as 48% of the patients who had CAM were due to family advice and 33% were after friends' pressure. Also among the motivations for utilization of CAM among the studied patients was the trust of CAM providers which accommodates with the cultural background of the Arabic region as flak medicine was initiated first and for a long time building a bridge of confidence among the general population. Also CAM providers in the Arabic region usually have a religious background (Holy Quran people, Masjed care givers) which in turn blends their opinion with a solid religious attitude.

As for consulting physicians before using CAM, two thirds of the patients refused physicians' consultation before having the supplements as half of the patients have the attitude of no need to tell doctors due to doctors' negative attitude toward CAM. However, more than 70% of CAM users were satisfied with their behavior and this may be due to low cost or psychological improvement recorded by three quarters of patients.

As for the achieved benefits after utilization of CAM, about 76% of patients recorded having benefits from using CAM due to their belief in its role in lowering blood glucose level and weight reduction. The effect of CAM utilization in glycemic control in the current study is unclear as many patients used CAM after being diagnosed as diabetics. The patients used CAM in combination with medications so the recorded improvement cannot be totally attributed to CAM utilization.

Several studies reported the effect of CAM utilization among diabetics. In a study conducted by Arjuna et al. (22), the incidence of hypoglycemia in CAM users was 21% and 16.6% in non-users. The difference was not statistically significant. Another study by Sadiq et al. (23) found that 32.7% of diabetic patients thought that CAM is safe, effective (20.9%) and less costly (19.1%). Only 16.4% patients disclosed regarding their CAM usage to the attending physician, while 83.6% did not.

CAM utilization was significantly associated with the female gender, young newly diagnosed cases, presence of comorbidities or complications of diabetes. Adequate identification of patients' perspectives toward CAM can help health care professionals achieve a more patient-centered approach, optimize good pharmaceutical care planning and ensure safe practice (23).

Study limitations

Observed improvement among diabetic patients cannot be totally attributed to using CAM. Moreover, a placebo effect can be considered with CAM utilization. So, controlled prospective studies are needed to be able to adjust for confounders and to test the true association between CAM utilization and any observed clinical improvement among type 2 diabetic patients.

In conclusion, nearly three out of each four diabetic patients use at least one type of CAM, especially females with recent diagnosis. Herbs are the most frequently used CAM at initial diagnosis of DM. Satisfaction toward CAM utilization is high, mainly due to trusting CAM providers. More focused studies are needed to test the true association between CAM utilization and the recorded improvement by patients after controlling any confounders and removing temporality bias. Also medical staff should play a more important role in explaining the medical and scientific approach of the role of CAM in diabetic patients based on research and trials in this field.

References

1. Alotaibi A, Perry L, Gholizadeh L, Al-Ganmi A. Incidence and prevalence rates of diabetes mellitus in Saudi Arabia: An overview. Journal of Epidemiology and Global Health 2017(7):211–218.
2. Pandey A, Tripathi P, Pandey R, Srivatava R, Goswami S. Alternative therapies useful in the management of diabetes: A systematic review. J Pharm Bioallied Sci. 2011; 3(4): 504–512.
3. Zia T, Hasnain SN, Hasan SK. Evaluation of the oral hypoglycemic effect of Trigonella foenum-graecum in normal mice. J Ethanopharmacol 2001; 75:191–5.

4. Shaikh BT, Hatcher J. Complementary and Alternative Medicine in Pakistan: Prospects and Limitations. eCAM 2005;2(2)139–142.
5. National Center for Complementary and Integrative Health. Complementary, alternative, or integrative health: what's in a name? (2015-03) [2015-12-03]. https://nccih.nih.gov/ health/integrative-health.
6. Penson RT, Castro CM, Seiden MV, Chabner BA, Lynch TJ. Complementary, alternative, integrative, or unconventional medicine? Oncologist 2001; 6:463–73.
7. World Health Organization. The ICD-10 Classification of Mental and Behavioral Disorder 1992; Geneva: WHO.
8. Nahin RL, Dahlhamer JM, Taylor BL, Barnes PM, Stussman BJ, Simile CM, Blackman MR, Chesney MA, Jackson M, Miller H, McFann KK. Health behaviors and risk factors in those who use complementary and alternative medicine. BMC Public Health 2007, 7:217.
9. Egede LE, Ye X, Zheng D, Silverstein MD. The prevalence and pattern of complementary and alternative medicine use in individuals with diabetes. Diabetes Care, 2002; 25(2):324-9.
10. Al-Habeeb TA. A pilot study of faith healers' views on evil eye, jinn possession, and magic in the Kingdom of Saudi Arabia. SSFCM Journal, 2003; 10(3):31-38.
11. Birdee GS, Yeh G. Complementary and Alternative Medicine Therapies for Diabetes: A Clinical Review. Clinical Diabetes 2010; 28(4): 147-155.
12. Gardiner P, Graham RE, Legedza AT, Eisenberg DM, Phillips RS. Factors associated with dietary supplement use among prescription medication users. Arch Intern Med 2006; 166:1968–1974.
13. Kennedy DA, Seely D. Clinically based evidence of drug-herb interactions: a systematic review. Expert Opin Drug Saf 2010; 9:79–124.
14. National Center for Complementary and Integrative Health. Complementary, alternative, or integrative health: What's in a name? National Institute of Health (NIH), U.S. Department of Health and Human Services, Bethesda; 2016
15. Nigil Haroon, N., Anton, A., John, J. et al. Effect of vitamin D supplementation on glycemic control in patients with type 2 diabetes: A systematic review of interventional studies. J Diabetes Metab Disord. 2015; 14: 3.
16. Forouhi, N.G., Menon, R.K., Sharp, S.J. et al. Effects of vitamin D2 or D3 supplementation on glycaemic control and cardiometabolic risk among people at risk of type 2 diabetes: Results of a randomized double-blind placebo-controlled trial. Diabetes Obes Metab. 2016; 18: 392–400.
17. Ghavamzadeh, S., Mobasseri, M., and Mahdavi, R. The effect of vitamin D supplementation on adiposity, blood glycated hemoglobin, serum leptin and tumor necrosis factor-alpha in type 2 diabetic patients. Int J Prev Med. 2014; 5: 1091–1098.
18. Clarke, T.C., Black, L.I., Stussman, B.J. et al. Trends in the use of complementary health approaches among adults: United States, 2002–2012. Natl Health Stat Report. 2015; 1–16.
19. Ryan, E.A., Pick, M.E., and Marceau, C. Use of alternative medicines in diabetes mellitus. Diabet Med. 2001; 18: 242–245.
20. Yeh, G.Y., Eisenberg, D.M., Davis, R.B. et al. Use of complementary and alternative medicine among persons with diabetes mellitus: Results of a national survey. Am J Public Health. 2002; 92: 1648–1652.
21. Bukhsh A, Gan SH, Goh BH, Khan TM. Complementary and alternative medicine practices among type 2 diabetes patients in Pakistan: A qualitative insight. European Journal of Integrative Medicine. 2018 Oct 1; 23:43-9.
22. Medagama AB, Bandara R, Abeysekera RA, Imbulpitiya B, Pushpakumari T. Use of complementary and alternative medicines (CAMs) among type 2 diabetes patients in Sri Lanka: a cross sectional survey. BMC complementary and alternative medicine. 2014 Dec; 14(1):374.
23. Sadiq S, Kaur S, Khajuria V, Gupta S, Sharma A. Complementary and alternative medicine use in medical OPD patients of rheumatoid arthritis in a tertiary care hospital. Natl J Physiol Pharm Pharmacol. 2016; 6(4):305-9.

Reproductive risk factors of breast cancer

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Abstract

Background: Reproductive risk factors are important factors that have an effect on breast cancer risk, and incidence. This study aimed to study the effect of reproductive factors such as breast cancer risk factor.

Methods: Retrospective case control study, with a randomly selected 147 breast cancer cases compared with 161 non-breast cancer cases.

Results: Age at 1st delivery ≥30 years was significantly associated with increased risk of breast cancer OR 2.7. Nulliparity parity, had ≥ 3 full term pregnancies had no-significant association with increased risk of breast cancer1.28, and 1.97 respectively. Among those aged ≤ 45years having ≥3 children significantly had 2.7(1.02-7.3) risk than those who had 1-2 children, while among those aged > 45 years multiparty showed a non significantly protective effect with OR, 0.8(0.3-2.3). Age stratification show that age at first delivery ≥30 years had significant increased risk among those aged ≤ or > 45 years; OR 4.1, and 1.2, respectively. The Odds ratio for lactation for >12 month was 1.03(0.5-2.1), among those aged ≤ 45 years, with higher protective effect among those aged > 45 years, 0.6 (0.3-1.3).

Conclusion: Age at 1st full term pregnancy was an important factor affecting breast cancer risk. Parity has a dual effect in breast cancer risk.

Key words: Breast cancer. Risk factors, parity, age at 1st delivery, breast feeding

Introduction

Breast cancer is the chief and most commonly diagnosed cancer among women globally and the major reason of deaths related to cancer in the developing world[1].

The effect of reproductive factors strongly supports a hormonal role in the etiology of breast cancer [2].

Not breast feeding is another risk factor that is responsible for 5% of breast cancer cases in the UK [3] with lower risk among BRCA1 mutation carriers, while, it is not associated with BRCA2 carriers [4,5].

Full term pregnancy before age 20 years decreases breast cancer risk about 50%, than nulliparous or after 35 years [6] .

Alpha-fetoprotein, a protein produced by the fetus during pregnancy, helps regulate fetal growth. It can also help suppress breast cancer cells. Over the age of 30, alpha-fetoprotein works differently, and may actually help promote rather than inhibit breast cancer development. [7].

The risk of breast cancer declines with the number of children borne. Women who have given birth to five or more children have half the breast cancer risk of women who have not given birth [8].

The results of findings from analysis propose that the number of parities and the longer duration of breastfeeding were inversely associated with the risk of breast cancer [9].

Few detailed studies have been carried out on reproductive risk factors of breast cancer. The aim of this study was to estimate the effect of reproductive risk factors on breast cancer in Iraq.

Patients and methods

A retrospective case control study was done on patients of breast cancer registered in the women's health center, in Al-Elwyia maternity teaching hospital, during the period from 1st Jan- 30th October 2018. All 147 selected cases of breast cancer were included after documented histopathological examination and compared with 161 women registered in the women's health center, in Al-Elwyia Maternity Teaching Hospital, and proved not to have breast cancer by radiological, histopathological and cytological investigations.

Data was obtained through standardized questionnaire and follow up medical records to obtain the information about the demographic, characteristics, and different risk factors e.g. reproductive, hormonal and genetic risk factors of breast cancer. All breast cancer cases were included and a random sample of women without breast cancer attending the women's health center were included. The diagnosis of cases and controls done by consultant medical staff, using a Triple Assessment Technique (i.e. physical breast examination, ultrasonography, with or without mammography and fine needle aspiration cytology) according to the patient state.

The risk factors of age at menarche, age at menopause, age at 1st pregnancy and family history, were noted and categorized according to Centers for Disease Control and prevention CDC.[10]

The Statistical Package for Social Sciences (SPSS, version 18) was used for data entry and analysis. Pearson Chi- square ($\chi 2$) test was used to compare proportions of different factors among different groups of the study sample. Odds ratio, and adjusted OR was calculated using binary logistic regression using Enter method and were used to find the associations of risk factors. P value of ≤ 0.05 was regarded as statistically significant.

Results

The reproductive risk factors data show that : the Odds ratio was significantly associated with breast cancer regarding age at 1st delivery ≥30 years (2.7), while the number of full term pregnancies was non- significant as compared with the nulliparous with women who had 1-2 full term pregnancies (1.28), and (1.97) and for those had ≥ 3 full term pregnancies, as shown in Table 1.

Table 2 shows the age stratification of parity and breast cancer: the nulliparous were non-significantly associated with breast cancer with OR 0.7 (0.3-1.7), 1.6 (0.5-4.5) among those aged ≤ 45 years, and > 45 years, respectively.

Comparing the number of children, shows that among those aged ≤ 45years having ≥3 children significantly has 2.7(1.02-7.3) risk than those who had 1-2 children while among those aged > 45 years there is non- significant multiparity showing no significantly protective effect with OR, 0.8(0.3-2.3).

The Odds Ratio was significantly associated with breast cancer regarding age at 1st delivery ≥30 years, 4.1among those aged ≤ 45 years, with lower risk among those aged > 45 years, (1.2) as shown in Table 3.

The Odds Ratio was non-significantly associated with breast cancer regarding lactation for >12 month 1.03(0.5-2.1), among those aged ≤ 45 years, with higher protective effect among those aged > 45 years, 0.6(0.3-1.3), as shown in Table 4.

Table 1: The Reproductive risk factors among breast cancer cases and women without breast cancer

Reproductive factors		Cases	Controls	Total	OR	P value
Parity	Nulliparous	25	34	59	0.765(0.43-1.4)	> 0.05
		17.00%	21.10%	19.20%		
	Parous	122	127	249		
		83.00%	78.90%	80.80%		
No. of children	Nulliparous	25	34	59	1.28(0.62-2.62)	>0.05
		17.00%	21.10%	19.20%		
	1_2	23	40	63	1	
		15.60%	24.80%	20.50%		
	≥3	99	87	186	1.97(1.1-3.6)	0.022
		67.30%	54.00%	60.40%		
Lactation	<12 months	68	68	136	1.2 (0.75-1.84)	>0.05
		46.30%	42.20%	44.20%		
	≥12 months	79	93	172	1	
		53.70%	57.80%	55.80%		
Age at 1st delivery	<30	99	117	216	1	<0.05
		67.30%	72.70%	70.10%		
	≥30 years	23	10	33	2.7(1.2-5.98)	
		15.60%	6.20%	10.70%		

Table 2: The association between breast cancer and parity

	Controls No.%	Cases No.%	OR	P
Age ≤ 45 years				
Multiparous	88(73.3%)	32(26.70%)		
Nulliparous	29(80.60%)	7(19.40%)	0.7(0.3-1.7)	0.38
No. of births				
Nulliparous	29(80.6%)	7(19.4%)	1.4(0.4-4.5)	0.6
1-2 children	34(85%)	6(15%)	1	
≥3 children	54(67.50%)	26(32.5%)	2.7(1.02-7.3)	0.04
Age according to code 45 >45				
Multiparous	39(30.20%)	90(69.80%)		
Nulliparous	5(21.70%)	18(78.30%)	1.6(0.5-4.5)	0.4
No. of births				
Nulliparous	5(21.7%)	18(78.3%)	1.3(0.3-4.9)	0.7
1-2 children	6(26.1%)	17(73.9%)	1	
≥3 children	33(31.1%)	23(79.30%)	0.8(0.3-2.3)	0.6

Table 3: The association between breast cancer and age at 1st delivery

	Control	Cases	OR(CI)	P
Age at diagnosis ≤ 45 years				
Age of 1st delivery				
<30 years	112(77.20%)	33(22.80%)	1	
≥30 years	5(45.50%)	6(54.50%)	4.1(1.2-14.2)	0.02
Age at diagnosis >45				
Age at 1st delivery				
<30 years	38(29.50%)	91(70.50%)	1	
≥30 years	6(26.10%)	17(73.90%)	1.2(0.4-3.2)	0.7

Table 4. The association between breast cancer and duration of Breast feeding

	Control	Cases	OR(CI)	P value
Age at diagnosis ≤ 45 years				
Lactation				
≤12 months	52(75.40%)	17(24.60%)	1.03(0.5-2.1)	0.9
>12 months	65(74.7%)	22(25.3%)		
Age at diagnosis > 45 years				
Lactation				
≤12 months	16(23.90%)	51(76.1%)	0.6(0.3-1.3)	0.2
>12 months	28(32.9%)	57(67.1%)		

Discussion

The non-significant difference in parity among cases and controls reported in previous literature in Iraq [11,12] may be related to the fact that most of the Iraqi females get married at an early age and had mean family size of 5.5-6 persons.

Nulliparous was non-significant having 1.6 OR than parous among women aged > 45 years. This also reported in Iraq OR 2.1 [13] .

Women who had 3 or more children have OR of 1.97 compared to those who had 1-2 children. This goes along with what was found by Essiben F etal (1.43) for those had 3-5 children and 1.73 for > 5 children [14].

Previous studies done by, Lambe et al. [15], Liu et al. [16], Julie R et al [17] and Albrektsen G et al [18] demonstrated the presence of a transient increase in risk of breast cancer associated with each full-term birth, followed by a reduction in risk many years later.

Full-term pregnancy has several effects that could influence the risk of breast cancer [15,19].

The terminal differentiation of lobular mammary cells occurs at completion of a full-term pregnancy, leaving them less susceptible to malignant transformation. Women with 1st full term pregnancy at young age had less duration between menarche and pregnancy, thus reduced risk of breast cancer [20] .

The increased parity of more than 3 children is associated with decreased risk of breast cancer after age of 45 years. This may be explained by that found previously, that the increased risk with parity reaches its highest level at approximately 5 years after the birth and disappears approximately 15 years later [16] .

The transient increase in risk after birth was strongest after a late first birth, or subsequent pregnancies after age 30 years. [21]

The mother's age at births, as well as birth spacing, influenced the magnitude and timing of the transient increase in risk shortly after a delivery [18] . Most o Iraqi women in the cities tend to complete their families before age of 40 years, with little spacing, therefore this effect may be strong in early life and reduced after 45 years, especially if females married early.

All the above support the finding that late age (≥30 years) at 1st pregnancy had 2.7 fold of increased risk than those aged less than 30 years. Age stratification shows stability of increased risk of breast cancer with increasing age at 1st birth, this effect was more obvious in those aged≤ 45 years. This goes along with that found in previous studies in Iraq 3.4 [13] .

The promoting effect of pregnancy oestrogen was more prominent and the proportion of oestrogen and progesterone receptor positive breast tumours has been found to increase with age [22] with the highest proportion of oestrogen and progestron receptors at age 35–39 years [23].

Some studies found heterogeneity in reproductive risk factors for the distinct subtypes of breast tumors, as triple negative breast cancer had fewer consistent associations with reproductive factors and the only protective factor most consistently associated with TNBC was longer duration of breastfeeding [24] or the genetic hormonal pathways effect where it was reported that the number of deliveries at early age had a dose-response protective effect on breast cancer except for the women carrying C allele in rs2229712 who did not benefit from this protective effect [25] .

The changes in childbearing pattern during recent decades, with fewer children and higher age at births [26] will probably affect cancer incidence in the future.

From the findings of this study it is important to study the changes in reproductive behavior in relation to breast cancer risk, and the genetic subtypes of breast cancer.

References

1- Globocan 2012. International Agency for Research on Cancer, Lyon, IARC Press, 2013.
2- McPherson K, Steel C M, Dixon JM. Breast cancer epidemiology, risk factors, and genetics. BMJ .2000;321:624-628]
3- World Cancer Research Fund / American Institute for Cancer Research. Continuous Update Project Findings & Reports. Accessed June 2017.
4- Pan H, He Z, Ling L, et al. Reproductive factors and breast cancer risk among BRCA1 or BRCA2 mutation carriers: Results from ten studies. Cancer Epidemiol. 2014 Feb; 38(1):1-8.
5- Friebel TM, Domchek SM, Rebbeck TR. Modifiers of cancer risk in BRCA1 and BRCA2 mutation carriers: systematic review and meta-analysis. J Natl Cancer Inst 2014; 106(6):dju091.
6- National Cancer Institute: PDQ® Breast Cancer Prevention [Internet]. Bethesda, MD: National Cancer Institute.[October 19, 2018]. Available from: https://www.cancer.gov/types/breast/patient/breast-prevention-pdq]
7- Russo, I. Fox Chase Cancer Center. Innovations Report. Genetic changes in breast tissue caused by pregnancy hormone helps prevent breast cancer. Published: 04/20/2005.
8- Lambe M, Hsieh CC, Chan HW, et al. Parity, age at first and last birth, and risk of breast cancer: a population-based study in Sweden. Breast Cancer Research and Treatment 1996; 38(3):305–311.
[PubMed Abstract]
9- Babalou A. The Association of Parity and Breastfeeding with Breast Cancer: A Review. Health Sci J. 2017, 11: 1
10- Visvanathan K, Chlebowski RT, Hurley P, et al. American Society of Clinical Oncology clinical prac¬tice guideline update on the use of pharmacologic interventions including tamoxifen, raloxifene, and aromatase inhibition for breast cancer risk reduction. J Clin Oncol. 2009;27: 3235-58.
11- Lafta RK, Saeed EQ, Isa S A. Risk Factors of Breast Cancer among Women (A Sample from Baghdad). Iraqi J. Comm. Med. 2013; 26(1):1-6.
12- Bahir BH, Al-Naqeeb AA., Niazy SM. Risk Factors for Breast Cancer in a Sample of Women. Iraqi J. Comm. Med.2012; 25: 4-8.
13- Altaha M. A. and Al-ani. Reproductive factors and risk of breast cancer. Al anbar Medical journal 2013; 11 (1):17-26.
14- Essiben F, Foumane P, Meka ENU, Soh PS, Sama,JD Osogo E, Mboudou1 ET. Risk Factors for Breast Cancer: A Case-Control Study of 315 Women Followed in the Gynecology and Oncology Departments of Two University Teaching Hospitals in Yaounde, Cameroon. Open Journal of Obstetrics and Gynecology 2016; 6(12): 676-88.
15- Lambe M, Hsieh CC, Trichopoulos D, Ekbom A, Pavia M, Adami HO. Transient increase in breast cancer risk after giving birth. N Engl J Med 1994; 331:5–9.
16- Liu Q, Wuu J, Lambe M, Hsieh SF, Ekbom A, Hsieh CC. Transient increase in breast cancer risk after giving birth: postpartum period with the highest risk. Cancer Causes Control 2002; 13:299–305.
17- Julie R. Palmer, Lauren A. Wise, Nicholas J. Horton, Lucile L. Adams-Campbell, Lynn Rosenberg. Dual Effect of Parity on Breast Cancer Risk in African-American Women. Journal of the National Cancer Institute, Vol. 95, No. 6, March 19, 2003:478-83.
18- G Albrektsen,1, I Heuch , S Hansen and G Kva˚le. Breast cancer risk by age at birth, time since birth and time intervals between births: exploring interaction effects. British Journal of Cancer (2005) 92, 167 – 75.
Pathak DR, Speizer FE, Willett WC, Rosner B, Lipnick RJ. Parity and breast cancer risk: possible side effect on age at diagnosis. Int J Cancer 1986; 37:21–5.
20- Russo J, Tay LK, Russo IH. Differentiation of the mammary gland and susceptibility to carcinogenesis. Breast Cancer Res Treat 1982; 2:5–73.
21- Pathak DR (2002) Dual effect of first full term pregnancy on breast cancer risk: empirical evidence and postulated underlying biology. Cancer Causes Control 13: 295–8.
22- Colditz GA, Rosner BA, Chen WY, Holmes MD, Hankinson SE (2004) Risk factors for breast cancer according to estrogen and progesteron receptor status. J Natl Cancer Inst 96: 218–28.
23-Walker RA, Lees E, Webb MB, Dearing SJ (1996) Breast carcinomas occurring in young women (o35 years) are different. Br J Cancer 74: 1796– 1800.
24- Kristin N. Anderson Richard B. Schwab, Maria Elena Martinez. Reproductive risk factors and breast cancer subtypes: a review of the literature. Breast Cancer Research and Treatment 2014; 144(1): 1–10.
25- Dierssen-Sotos T, Palazuelos-Calderón C, Jiménez-Moleón JJ , Aragonés N , Jone M. Altzibar, Castaño-Vinyals G , et al . Reproductive risk factors in breast cancer and genetic hormonal pathways: a gene-environment interaction in the MCC-Spain project. BMC Cancer201818:280]
26- Lee SH, Akuete K, Fulton J, Chelmow D, Chung MA, Cady B (2003) An increased risk of breast cancer after delayed first parity. Am J Surg 186: 409– 412.

Risk Factors for Obesity among Psychiatric Patients

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Abstract

Background: The relationship between obesity and common mental health disorders is complex. Because of the high prevalence of both depression and obesity and the fact that they both carry an increased risk for cardiovascular disease, a potential association between depression and obesity has been presumed and repeatedly been examined.

Aim: To estimate the prevalence and correlates of obesity among psychiatric patients in Abha city, Saudi Arabia.

Methodology: A descriptive cross-sectional approach was followed to include 250 patients attending the Psychiatry Hospital in Abha City, Saudi Arabia. Collected data included patients' demographic data, medical history, and received medications. Patients' body mass index (BMI) was assessed. Psychiatric history was extracted from patients' medical files for diagnosis and profile.

Results: Participant patients' age ranged from 18 to 75 years, with a mean age of 40.9±15.9 years. Normal weight was recorded among 37.2% of the sample and 27.6% of the patients had overweight while 35.2% were obese. Depression was the most frequently recorded psychiatric disease (40.4%) followed by anxiety (22.8%). There were significant associations between obesity and both depression and anxiety.

Conclusions and recommendations: Obesity is significantly associated with depression and other psychiatric diseases, while negatively associated with anxiety and obsessive convulsive disorder (OCD).

Key words: Obesity, body mass index, psychological disorders, prevalence.

Introduction

The growing prevalence of overweight and obesity in developed countries constitutes a noteworthy public health problem. World Health Organization (WHO) global estimates in 2014 reported that almost 40% of adults are overweight (body mass index [BMI] ≥25 kg/m2) with nearly a third of them obese (BMI ≥30 kg/m2) (1). Previous studies among general populations suggest that overweight or obesity bears a significant association with suffering from non-specific psychiatric morbidity (2) or specific psychiatric disorders, depression (3), anxiety disorders (3), suicidal conduct (5) and personality disorders (6).

Many studies reported significant associations between obesity and mood disorders. (7, 8). As the physical disturbances burden in obesity is well proved, [10], its relation to mental health is relatively less studied. In the last few decades, there was accumulating evidence for the relation between various psychiatric disorders and obesity (11, 12). Despite this, knowledge gaps still exist with regard to the magnitude and the nature of the association between obesity and various psychiatric conditions. Very few epidemiologic studies tested the relationship between obesity and anxiety or substance use disorders. Anxiety disorder recorded moderate positive relation with obesity in the community and clinic samples (13- 15). Alcohol abuse has been associated with lower risk of overweight and obesity (16).

In Saudi Arabia, obesity is one of the most common chronic health problems (17). Many studies have revealed that overweight and obesity have an upward trend (18). High prevalence of overweight (32%) and obesity (37%) among the adult population was recorded (19) whereas a recent study among male college students in Saudi Arabia also reported the prevalence of overweight (21.8%) and obesity (15.7%) (20). Many studies have covered obesity and psychological disorders trend independently in the Saudi community but very few have explored the relation between body mass index and psychological disorders.
The main objective of this study was to explore the association between obesity and common mental disorders in Abha, Saudi Arabia.

Methodology

A descriptive cross-sectional approach was followed to include adult (aged 18 years or more) psychiatric patients attending the Psychiatry Hospital in Abha City, Saudi Arabia.

Patients were included after explaining the purpose of the study and after confirming confidentiality of their data. An informed consent was fulfilled out by the patient themself or their caregiver. Patients with severe mental disorder or aggression and those with severe mental retardation were excluded. Data were extracted including patients' demographic data, medical history and medications received. Height was measured to the nearest 0.5 cm with a standardized stadiometer, while body weight was measured to the nearest 0.1 kg with a calibrated scale. Body Mass Index (BMI) was mathematically calculated [(weight in kg)/(squared height in meter2)]. Psychiatric history was extracted from patients' medical files for diagnosis and profile.

Data analysis
Data were collected, revised, coded and fed into a computer using the statistical software IBM SPSS (version 22). Statistical analysis was done using two-tailed tests and alpha error at 0.05. P-values less than 0.05 were considered as statistically significant. Descriptive analysis based on frequency and percent distribution was done for all patients' demographic and clinical data including obesity and psychiatric disorders. Bivariate relation between patients' BMI and psychiatric disorders was tested using Pearson's chi-square test. Odds ratio with 95% confidence interval was estimated to detect the magnitude and nature of relation between obesity and psychiatric disorders.

Results

Participant patients' age ranged from 18 to 75 years, with a mean age of 40.9±15.9 years. Male gender constituted 50.8%, most of them were married (52.4%), and the education levels were college (20.4%), secondary (26.8%), intermediate (25.2%), primary (16.4%) then illiterate (11.2%). The governmental employees constituted the majority of the sample (34.4%) and 58% were unemployed. Most of the sample (60.4%) recorded sufficient income (Table 1).

With regard to obesity (Figure 1), normal weight was recorded among 37.2% of the sample and 27.6% of the patients were overweight while 35.2% were obese.

Considering psychiatric disorders, depression was the most common (40.4%), followed by anxiety (22.8%), schizophrenia (16.8%), and phobia (10.4%) while Alzheimer and somatic disorders were the least recorded diseases (0.8% for each) (Figure 2).

Table 2 shows the relation between psychiatric disorders and obesity for the sampled patients. It was clear that the relation of obesity with depression showed highly significant association as depressed patients had 2.5 times more likelihood for obesity compared to non-depressed (OR 2.46 [1.44-4.2]. Anxiety was shown to be protective against obesity as anxious patients recorded 64% lower risk (OR=0.36 (0.17-0.73). Also patients with obsessive compulsive disorder (OCD) 78% showed a lower risk for obesity (OR=0.22 (0.05-1.0). As for dementia, and substance abuse schizophrenia showed increased risk of obesity with non-significant association. In total, patients with psychiatric disorder showed a highly significant association ($p<0.001$) with OR 9.18 [2.54-33.2].

Table 1: Sociodemographic Data of Studied patients with psychological disorder in Abha city

Personal data		No	%
Gender	Male	127	50.8
	Female	123	49.2
Mental Status	Single	48	19.2
	Married	131	52.4
	Divorced	48	19.2
	Widow	23	9.2
Education	Illiterate	28	11.2
	Primary	41	16.4
	Intermediate	63	25.2
	Secondary	67	26.8
	University	51	20.4
Occupation Work Place	Governmental	86	34.4
	Private	19	7.6
	Retired/ not working	145	58.0
Income	Sufficient and save	52	20.8
	Sufficient	151	60.4
	Not sufficient	47	18.8
Residence at high attitude	Yes	32	12.8
	No	218	87.2
Age	Mean±SD	40.9±15.9	
	Min - Max	18-75	

Figure 1: Obesity among sampled patients with psychological disorder in Abha City

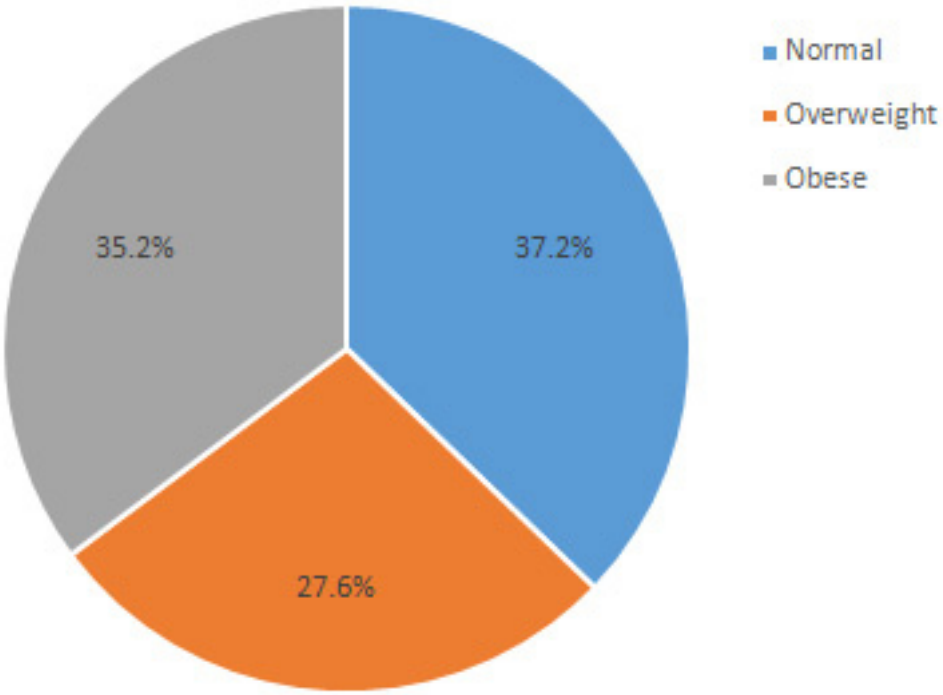

Figure 2: Psychiatric disorders among participants in Abha City

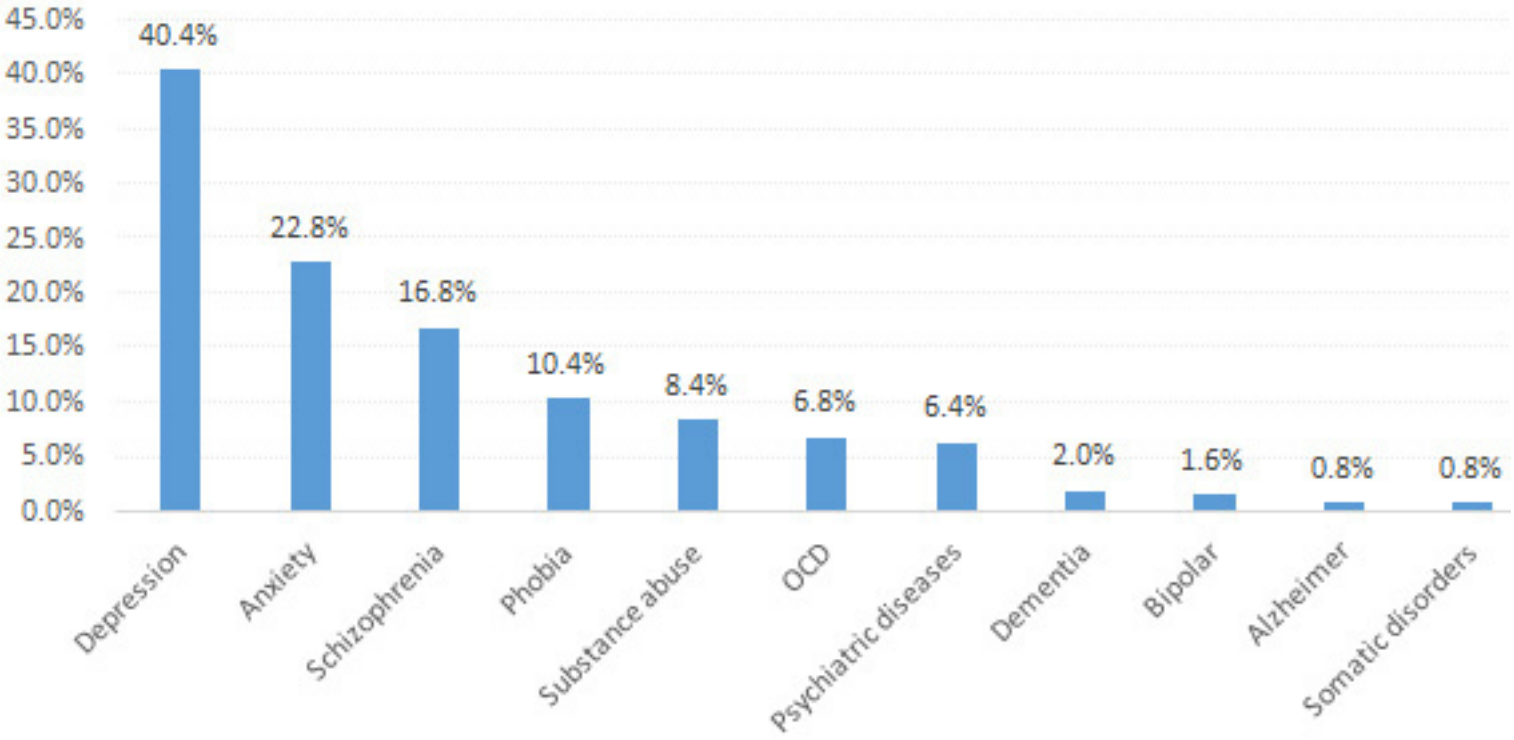

Table 2: Association between obesity and Possible psychiatric diseases among sampled patients in Abha city

Psychiatric disorder		Obese (n=88)		Non-obese (n=162)		P-value	OR (95% CI)
Depression	Yes	48	54.5%	53	32.7%	$\chi^2 = 11.2$	2.46 [1.44-4.2]
	No	40	45.5%	109	67.3%	P =0.001**	
Anxiety	Yes	11	12.5%	46	28.4%	$\chi^2 = 8.18$	0.36 [0.17-0.73]
	No	77	87.5%	115	71.6%	P =0.004**	
Phobia	Yes	7	8.0%	19	11.7%	$\chi^2 = 0.87$	0.65 [0.26-1.6]
	No	81	92.0%	143	88.3%	P =0.35	
Dementia	Yes	0	0.0%	5	3.1%	$\chi^2 = 2.77$	1.56 [0.96-1.71]
	No	88	100.0%	157	96.9%	P =0.11	
Substance abuse	Yes	10	11.4%	11	6.8%	$\chi^2 = 1.55$	1.76 [0.71-4.32]
	No	78	88.6%	151	93.2%	P =0.15	
Schizophrenia	Yes	18	20.5%	24	14.8%	$\chi^2 = 1.29$	1.47 [0.75-2.9]
	No	70	79.5%	138	85.2%	P =0.25	
OCD	Yes	2	2.3%	15	9.3%	$\chi^2 = 4.39$	0.22 [0.05-1.0]
	No	86	97.7%	147	90.7%	P =0.03*	
Psychiatric diseases	Yes	13	14.8%	3	1.9 %	$\chi^2 = 15.89$	9.18 [2.54-33.2]
	No	75	85.2%	159	98.1%	P<0.001***	

OR: Odds ratio 95% CI: Confidence interval OCD: Obsessive compulsive disorder
* P < 0.05
** P < 0.01
*** P < 0.001

Discussion

Psychiatric disorders are serious medical conditions that have high burden on all economic levels and all nations, and influence the affected individual's feeling, moods, thoughts and behavior (21). Among psychiatric illness, anxiety, depression, schizophrenia, bipolar disorder, panic disorder, eating disorder, and addictive behaviors are the most frequent. Worldwide, the prevalence of psychiatric illness ranges from 17% to 30%, affecting one in four people both in developed and developing nations (22).

In Saudi Arabia, a few studies covered that 48% of high school students had mental illness, 18.2% among adult primary care patients, and 59.4% of adolescents complained of at least one of the Depression Anxiety and Stress Scale (DASS) disorders during the period from 1986 to 2006 (23-25). These patients are usually neglected because of their disorder nature which also affects the general behavior of a person, alters the level of perception and impairs the level of functioning (26). They are more prone to metabolic disorders like obesity because of psychotropic medications, unhealthy lifestyles, cigarette smoking and healthcare inequalities (27-29).

The current study targeted patients attending the main psychiatric hospital in Abha city to explore their body mass index and to relate their body mass index to their psychiatric illness.

The study revealed that the most included in the obesity group, were patients with depression and anxiety, while those with somatic disorders were the least frequent group. Overweight and obesity were recorded among two thirds of patients. Obesity was higher among patients with depression (nearly doubled risk) and less recorded among patients with anxiety and OCD. All other psychiatric disorders were insignificantly related to obesity.

These findings were concordant with those of several other studies. Three cross-sectional studies which were done on general adult populations had an average OR of 1.33 for depression in obesity (30-32). This finding was confirmed in a meta-analysis of longitudinal studies in adolescents with roughly similar odds of developing depression in obesity (OR: 1.4) and vice versa (OR: 1.7) (33). Thus, the study provided evidence for a bidirectional link between obesity and depression with depressed adolescents having about 70% higher risk for being obese.

On the other hand, some studies failed to prove this association, where there was poor correlation between BMI and anxiety across both genders (r = 0.024 in males and 0.083 in females), while another cross-sectional study also reported a similar lack of association between BMI and both anxiety and depression (r = 0.15 and 0.1, respectively) (34, 35).

The association between obesity and psychological illness is up till now questionable and needs further assessment using large-scale research projects that control for all possible confounding factors.

In conclusion, this study revealed a significant positive association between obesity and depression but this association was negative for anxiety and OCD illness. Further assessment is recommended using a large scale survey covering all types of population (e.g., healthy, or psychotic) to explore the nature of the relation controlling for all possible confounders.

References

1. World Health Organization. World Health Statistics 2014. Geneva: World Health Organization; 2014. [Last cited on 2019. September 20]. Available from: http://www.apps.who.int/iris/bitstream/10665/112738/1/9789240692671_eng.pdf .
2. Kivimäki M, Batty GD, Singh-Manoux A, Nabi H, Sabia S, Tabak AG, Akbaraly TN, Vahtera J, Marmot MG, Jokela M. Association between common mental disorder and obesity over the adult life course. The British Journal of Psychiatry. 2009 Aug 1; 195(2):149-55.
3. Mather AA, Cox BJ, Enns MW, Sareen J. Associations of obesity with psychiatric disorders and suicidal behaviors in a nationally representative sample. Journal of psychosomatic research. 2009 Apr 1; 66(4):277-85.
4. Gariepy G, Nitka D, Schmitz N. The association between obesity and anxiety disorders in the population: a systematic review and meta-analysis. International journal of obesity. 2010 Mar; 34(3):407.
5. Dong C, Li WD, Li D, Price RA. Extreme obesity is associated with attempted suicides: results from a family study. International journal of obesity. 2006 Feb; 30(2):388.
6. Petry NM, Barry D, Pietrzak RH, Wagner JA. Overweight and obesity are associated with psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Psychosomatic medicine. 2008 Apr 1; 70(3):288-97.
7. Stunkard A, Faith M, Allison K. Depression and obesity. Biol Psychiatry. 2003; 54:330–7.
8. Faith M, Matz P, Jorge M. Obesity-depression associations in the population. J Psychosom Res. 2002; 53:935–42.
9. Kearns K, Dee A, Fitzgerald AP, Doherty E, Perry IJ. Chronic disease burden associated with overweight and obesity in Ireland: the effects of a small BMI reduction at population level. BMC Public Health. 2014 Dec; 14(1):143.
10. Lykouras L, Michopoulos J. Anxiety disorders and obesity. Psychiatriki. 2011 Oct; 22(4):307-13.
11. Lin HY, Huang CK, Tai CM, Lin HY, Kao YH, Tsai CC, Hsuan CF, Lee SL, Chi SC, Yen YC. Psychiatric disorders of patients seeking obesity treatment. BMC psychiatry. 2013 Dec; 13(1):1.
12. Beydoun MA, Wang Y. Pathway's linking socioeonomic status to obesity through depression and lifestyle factors among young US adults. J Affect Disord. 2010; 123:52–63.

13. Jorm A, Korten A, Christensen H, Jacomb P, Ridgers B, Parslow R. Association of obesity with anxiety, depression, and emotional well-being: a community survey. Aust N Z J Public Health. 2003; 27:434–40. [PubMed] [Google Scholar]
14. Cilli M, De Rosa R, Pandolfi C, Vacca K, Cugini P, Ceni ZBS. Quantification of sub-clinical anxiety and depression in essentially obese patients and normal-weight healthy subjects. Eat Weight Disord. 2003; 8:319–20. [PubMed] [Google Scholar]
15. Davis E, Rovi S, Johnson S. Mental health, family function and obesity in African-American Women. J Natl Med Assoc. 2005; 97:478–82.
16. John U, Meyer C, Rumpf H, Hapke U. Relationships of psychiatric disorders with overweight and obesity in an adult general population. Obes Res. 2005; 13:101–9.
17. Al-Nozha MM, Al-Mazrou YY, Al-Maatouq MA, Arafah MR, Khalil MZ, Khan NB, et al. Obesity in Saudi Arabia. Saudi Med J 2005; 26:824-9.
18. Al-Othaimeen AI, Al-Nozha M, Osman AK. Obesity: An emerging problem in Saudi Arabia. Analysis of data from the National Nutrition Survey. East Mediterr Health J 2007; 13:441-8.
19. Al-Saleem SA, Alshahrani AM, Al-Khaldi YM. Obesity among patients attending primary care centers, Aseer Region, Saudi Arabia. Saudi J Obes 2013; 1:67-70.
20. Al-Rethaiaa AS, Fahmy AE, Al-Shwaiyat NM. Obesity and eating habits among college students in Saudi Arabia: A cross sectional study. Nutr J 2010;9:39.
21. Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, Silove D. "The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013" . Int J Epidemiol. 2014Apr; 43(2):476–93.
22. Polanczyk GV, Salum GA, Sugaya LS, Caye A, Rohde LA. "Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents". J Child Psychol Psychiatry. 2015Mar; 56(3):345–65.
23. Al-Khathami AD, Ogbeide DO. "Prevalence of mental illness among Saudi adult primary-care patients in Central Saudi Arabia". Saudi Med J. 2002; 23(6):721–724.
24. Al-Gelban KS. "Depression, anxiety and stress among Saudi adolescent school boys". J R Soc Promot Health. 2007; 127(1):33–37.
25. Al-Sughayr AM, Ferwana MS. "Prevalence of mental disorders among high school students in National Guard Housing, Riyadh, Saudi Arabia". J Fam Community Med. 2012; 19(1):47–51.
26. Worldrightarrow Health Organization. WHO Mental Health Gap Action Programme (mhGAP) Geneva: World Health Organization; 2013.
27. Hammoudeh S, Ghuloum S, Mahfoud Z, Yehya A, Abdulhakam A, Al-Mujalli et al.. "The prevalence of metabolic syndrome in patients receiving antipsychotics in Qatar: a cross sectional comparative study". BMC Psychiatry 2018; 27; 18(1):81.
28. Ringen PA, Faerden A, Antonsen B, Falk RS, Mamen A, Rognli EBet al.. "Cardiometabolic risk factors, physical activity and psychiatric status in patients in long-term psychiatric inpatient departments". Nord J Psychiatry 2018; 9:1–7.
29. Ng B, Camacho A, Parra K, de la Espriella R, Rico V, Lozano S, Troncoso Met al.. "Differences in BMI between Mexican and Colombian patients receiving antipsychotics: results from the International Study of Latinos on Antipsychotics (ISLA)". Ethn Health 2018; 7:1–8.
30. Simon GE, Von Korff M, Saunders K, Miglioretti DL, Crane PK, Van Belle G, Kessler RC. Association between obesity and psychiatric disorders in the US adult population. Archives of general psychiatry. 2006 Jul 1; 63(7):824-30.
31. Zhong W, Cruickshanks KJ, Schubert CR, Nieto FJ, Huang GH, Klein BE, Klein R. Obesity and depression symptoms in the Beaver Dam Offspring Study population. Depression and anxiety. 2010 Sep 1; 27(9):846-51.
32. Kim JY, Chang HM, Cho JJ, Yoo SH, Kim SY. Relationship between obesity and depression in the Korean working population. Journal of Korean medical science. 2010 Nov 1; 25(11):1560-7.
33. Mannan M, Mamun A, Doi S, Clavarino A. Prospective associations between depression and obesity for adolescent males and females-a systematic review and meta-analysis of longitudinal studies. PLoS One. 2016 Jun 10; 11(6):e0157240.
34. Ejike CE. Association between anxiety and obesity: A study of a young-adult Nigerian population. Journal of neurosciences in rural practice. 2013 Aug; 4(Suppl 1): S13.
35. Guedes EP, Madeira E, Mafort TT, Madeira M, Moreira RO, Mendonça LM, Godoy-Matos AF, Lopes AJ, Farias ML. Body composition and depressive/anxiety symptoms in overweight and obese individuals with metabolic syndrome. Diabetology & metabolic syndrome. 2013 Dec; 5(1):82.

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Public Awareness and Utilization of the Primary Health Care Services in Al-Madinah, Saudi Arabia

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Abstract

Objectives / Background: The presence of PHC alone is not enough to guarantee the utilization of provided services; the level of awareness can affect the use of these services. This study has assessed the awareness level and addressed various factors that could encourage or discourage patients to utilize PHC in Al-Madinah.

Method: A cross-sectional, descriptive, community-based study was conducted from January to March 2018 through a self-administered questionnaire. The questionnaire included questions about sociodemographic characteristics and assessed the awareness and utilization of PHC services in Al-Madinah. Data were collected from 481 randomly sampled individuals.

Results: More than 80% of the respondents were aware of the existence of a PHCC in their district. Nonetheless, 30.7% of them never utilized PHC services. The most known services provided by PHC were immunization (79%), referral to secondary/tertiary hospitals (60%), and follow-up for children's health (54.3%). However, other services fell behind in awareness, such as anti-smoking clinics (11.2%) and community psychiatric clinics (5.8%). The utilization of PHCCs was significantly associated with age, sex, marital status, occupation and general health status. The main reason encouraging respondents to utilize PHCCs was the short distance between the place of residence and the PHCC location (54.1%), while the main reason for not using PHC was dissatisfaction with services (38.3%).

Conclusion: Regular assessment of patient satisfaction and patterns of utilization is important to promote the quality of PHC services. Also, to maximize PHC utilization, collaborative efforts from PHC staff, the government, and the Al-Madinah community are needed.

Key words: Awareness, Utilization, Primary Health Care, services, Al-Madinah.

Introduction

Primary health care (PHC) is the cornerstone of the health care system (1). It delivers health care to all people and provides health promotion, disease cures, and prevention(2). In addition, it is considered to provide access to secondary and tertiary health care(3). In Saudi Arabia, the PHC program was established in 1983 based on the World Health Organization (WHO) concept that states "Health for all" according to the "Alma Ata" declaration (Sep. 1978)(2). Over time, PHC has been given high priority by the Saudi government(4). According to the Ministry of Health (MOH) in Saudi Arabia, there were 2,325 PHC centers (PHCCs) distributed throughout the Kingdom in 2016. About seven percent (162) of these centers are located in the Al-Madinah region(5). This advancement in PHC services has improved the health indicators, but that is not the only factor. Increased community health awareness and better public education has also contributed to this improvement. Thus, public awareness of these services is essential to achieve PHC goals(6). Research based-evidence should be carried out to identify the level of population awareness regarding PHC services. Moreover, the level of awareness can affect the utilization of these services. A few studies have discussed patient satisfaction with PHC services or their utilization in some cities in Saudi Arabia, but none have mentioned public awareness regarding PHC services in Al-Madinah Al-Munawarah (northwest Saudi Arabia) or in other regions of Saudi Arabia. In this cross-sectional study, the researchers aimed to assess the awareness and utilization of PHC services in the city of Al-Madinah.

Methodology

Ethical approval for this study was obtained from the Medical Ethics Committee of Taibah University in Al-Madinah. A descriptive, cross-sectional study was conducted between January 1st, 2018 and March 1st, 2018 on adult citizens who lived in Al-Madinah, Saudi Arabia. In this study, data were collected by a self-administered questionnaire. The questionnaire sought health status information and socio-demographic data consisting of age, gender, marital status, occupation, and educational level. Also, the questionnaire included other questions assessing the awareness and utilization of PHC services in Al-Madinah by assessing the respondents' awareness of PHCCs in their district, the number of visits during the year, the encouraging and discouraging factors for utilizing PHCCs, and the awareness of services provided by PHCCs. The target population was Saudi citizens who were 18 and above and living in Al-Madinah. Excluded were those who were younger than 18, lived outside of Al-Madinah, or were non-Saudi. A sample size of 471 was estimated with a confidence level of 97%. This was calculated using "OpenEpi", a statistical website for sample size calculation. The study population was recruited by a random sampling technique over a two-month period from January to March 2018. Consent was obtained from the participants in the introduction of the questionnaire; further, they were informed that their participation was voluntary, and their inserted information was confidential. The questionnaire data was entered and checked for completeness via Google Drive online forms. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), Version 21. Demographic characteristics, the number of PHCC visits per year, and awareness regarding PHC services were summarized using descriptive statistics. A Chi-square test was used to determine the significance of the association between respondents' demographic characteristics and PHC utilization. A P-Value of <0.05 was considered significant.

Results

Socio-Demographic Characteristics:

A total of 481 adult respondents were surveyed from January to March 2018. Half of the respondents (50.1%) were 18-25 years old. Most of the respondents (418) (86.9%) were female, while the remaining 63 (13.1%) were male. About half of the respondents (247) (51.4%) were married, and the rest (234) (48.6%) were single. Regarding the level of education, 394 (81.9%) respondents had tertiary education, while 86 (17.9%) and 1 (0.2%) had secondary education and primary or no formal education, respectively. Among the study population, 214 (44.5%) respondents were students, 169 (35.1%) were employed, 58 (12.1%) were housewives, 25 (5.2%) were unemployed, 9 (1.9%) were retired, and 6 (1.2%) were freelancers. The majority of the respondents (388) (80.7%) were medically free, while 93 (19.3%) had chronic illnesses. Among the chronically ill subjects, 36.6% had hypertension, 30% had hypothyroidism, and 25.8% had diabetes (Table 1).

Awareness of PHC Services:

Most respondents (83.4%) were aware of the existence of a PHCC in their district. Despite this high awareness, 30.7% of those who were aware of the PHCCs had never

Abbreviations

PHC	Primary health care
PHCC	Primary health care center
WHO	World Health Organization
MOH	Ministry of Health
SPSS	Statistical Package for Social Sciences
CBAHI	Central Board for Accreditation of Healthcare Institutions
JCI	Joint Commission International.

utilized their services. More than 80% of the respondents stated that they have an understanding of PHC services. The most common health services provided by PHCCs of which respondents were aware were immunization services (79%), followed by referral to secondary/tertiary hospitals (60%), child health follow-ups (54.3%), chronic disease follow-ups (50.9%), and antenatal care (49.1%). The study revealed that only 5.8% of the respondents were aware of the services available for psychiatric illness diagnosis and treatment (Table 2).

Utilization of PHC Services and Demographic Profile of Respondents:

Two hundred and seven (43.0%) respondents claimed that they visit PHCCs 1-2 times yearly, 80 (16.6%) claimed 3-9 times yearly, 15 (3.1%) claimed monthly, and 179 (37.2%) claimed that they did not use PHC services. In the present study, married respondents were 14 times more likely to utilize the PHC services monthly than unmarried respondents. It was observed that frequent PHC service utilization was significantly associated with age, sex, marital status, occupation, and general health status. A significantly higher proportion of frequent PHC users was found among respondents who were over 55, male, married, retired, and had chronic illnesses (Table 3).

Reasons for Utilization:

Regarding major reasons for PHC utilization, over half of the respondents (54.1%) chose the proximity of the PHCC to their place of residence, 31.2% chose the accessibility to the governmental secondary and tertiary hospitals via the referral system, and 24.6% chose appointment availability. Other reasons were free services (21.7%), services meet health needs (11.6%), good health service (11.1%), and physician awareness of the patient's medical history (3.6%) (Table 4).

Reasons for non-utilization:

More than one-third (38.3%) of the respondents attributed non-utilization of PHC facilities to poor services, while (31.5%) believed that PHC facilities did not meet their health needs. Other reasons were unsuitable working hours (29.4%), doctors less-qualified than hospital doctors (28%), the belief that a health condition did not require PHC (23.1%), and lack of knowledge regarding the existence of a PHCC in the district (4.2%) (Table 5).

Table 1: Socio-demographic Characteristics of Respondents (n=481)

Variable	Frequency	Percentage
Age		
18 - 25	241	50.1%
26 - 35	84	17.5%
36 - 45	90	18.7%
46 - 55	48	10%
56 - 65	12	2.5%
Above 65	6	1.2%
Sex		
Female	418	86.9%
Male	63	13.1%
Marital Status		
Single	234	48.6%
Married	247	51.4%
Educational Level		
Primary or No Formal Education	1	0.2%
Middle / High School	86	17.9%
Higher Education	394	81.9%
Occupation		
Employed	169	35.1%
Housewife	58	12.1%
Retired	9	1.9%
Freelancer	6	1.2%
Student	214	44.5%
Unemployed	25	5.2%
Health Status		
Chronically Ill	93	19.3%
Medically Free	388	80.7%

Table 2: Respondents Awareness of Some PHC Service Components (n=481)

PHC Services	Aware (%)	Not Aware (%)
Immunization	380 (79%)	101 (21%)
Referral Services	289 (60%)	192 (40%)
Child Health: Follow-up	261 (54.3%)	220 (45.7%)
Chronic Diseases: Follow-up	245 (50.9%)	236 (49.1%)
Antenatal Care	236 (49.1%)	245 (50.9%)
Essential Drugs	230 (47.8%)	251 (52.2%)
Sick Leave	223 (46.4%)	258 (53.6%)
Treatment of Common Diseases	134 (27.9%)	347 (72.1%)
Health Education	126 (26.2%)	335 (73.8%)
Medical Consultation	121 (25.2%)	360 (74.8%)
Emergency Cases	113 (23.5%)	368 (76.5%)
Annual Investigations	111 (23.1%)	370 (76.9%)
Follow-up Fracture Cases	107 (22.2%)	374 (77.8%)
Screening Tests	87 (18.1%)	394 (81.9%)
Anti-Smoking Clinics	54 (11.2%)	427 (88.8%)
Radiological Imaging	28 (5.8%)	453 (94.2%)
Community Psychiatric Clinic	28 (5.8%)	453 (94.2%)

(See next page for Table 3: Socio-demographic Characteristics of Respondents as Related to Utilization of PHC Services (n=481)

Table 4: Reasons for Utilizing PHC Services (Multiple Responses) (n=481)

Reasons	Frequency	Percentage
PHCC is Near to the Place of Residence (Distance)	224	54.1%
Secondary/Tertiary Hospitals Require a Referral from PHC	129	31.2%
Available Appointments	102	24.6%
Services Free of Charge	90	21.7%
Provided Services Meet my Health Needs	48	11.6%
Good Health Services	46	11.1%
Physician Knows my Medical History and Records	15	3.6%

Table 5: Reasons for Non-utilization of PHC Services (Multiple Responses) (n=481)

Reasons	Frequency	Percentage
Dissatisfactory Health Service	38.3%	164
Provided Services Do Not Meet My Health Needs	31.5%	135
Unsuitable Working Hours	29.4%	126
Doctors in Hospitals Are More Qualified Than PHC Doctors	28%	120
My Health Condition Does Not Require PHC	23.1%	99
Lack of Knowledge Regarding PHC Existing in the District	4.2%	18

Table 3: Socio-demographic Characteristics of Respondents as Related to Utilization of PHC Services (n=481)

Socio-demographic Characteristics	Never-Used (%)	Ever-Used (%)	Frequency of PHC Services Utilization n= 302			Total (%)	X2	P-value
			1-2	3-9	Monthly			
Age								
18-25	113 (46.9)	128 (53.1)	104 (43.2)	23 (9.5)	1 (0.4)	241 (100.0)	58.934a	.000
26-35	21 (25.0)	63 (75.0)	44 (52.4)	17 (20.2)	2 (2.4)	84 (100.0)		
36-45	24 (26.7)	66 (73.3)	35 (38.9)	25 (27.8)	6 (6.7)	90 (100.0)		
46-55	18 (37.5)	30 (62.5)	14 (29.2)	13 (27.1)	3 (6.3)	48 (100.0)		
56-65	2 (16.7)	10 (83.3)	7 (58.3)	1 (8.3)	2 (16.7)	12 (100.0)		
Above 65	1 (16.7)	5 (83.3)	3 (50.0)	1 (16.7)	1 (16.7)	6 (100.0)		
Sex								
Female	157 (37.6)	261 (62.4)	190 (45.5)	60 (14.4)	11 (2.6)	418 (100.0)	16.826a	.001
Male	22 (34.9)	41 (65.1)	17 (27.0)	20 (31.7)	4 (6.3)	63 (100.0)		
Marital status								
Single	118 (50.4)	116 (49.6)	98 (41.9)	17 (7.3)	1 (0.4)	234 (100.0)	56.142a	.000
Married	61 (24.7)	186 (75.3)	109 (44.1)	63 (25.5)	14 (5.7)	247 (100.0)		
Educational Level								
No formal Education/Primary	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)	10.361a	.110
Secondary	29 (33.7)	57 (66.3)	33 (38.4)	19 (22.1)	5 (5.8)	86 (100.0)		
Tertiary	150 (38.1)	244 (61.9)	174 (44.2)	60 (15.2)	10 (2.5)	394 (100.0)		
Occupation								
Unemployed	7 (28.0)	18 (72)	14 (56.0)	3 (12.0)	1 (4.0)	25 (100.0)	45.368a	.000
Student	98 (45.8)	116 (54.2)	94 (43.9)	21 (9.8)	1 (0.5)	214 (100.0)		
Housewife	17 (29.3)	41 (70.7)	21 (36.2)	17 (29.3)	3 (5.2)	58 (100.0)		
Employed	54 (32.0)	115 (68.0)	73 (43.2)	34 (20.1)	8 (4.7)	169 (100.0)		
Freelancer	1 (16.7)	5 (83.3)	2 (33.3)	3 (50.0)	0 (0.0)	6 (100.0)		
Retired	2 (22.2)	7 (77.8)	3 (33.3)	2 (22.2)	2 (22.2)	9 (100.0)		
Chronic illness								
No	152 (39.2)	472 (60.8)	176 (45.4)	56 (14.4)	4 (1.0)	388 (100.0)	38.474a	.000
Yes	27 (29.0)	66 (71)	31 (33.3)	24 (25.8)	11 (11.8)	93 (100.0)		

Discussion

This study aimed to evaluate the population's awareness regarding services provided by PHCCs in Al-Madinah and the extent of their utilization. In addition, it explored possible factors that could contribute to the utilization of PHC services, along with other factors that discourage patients from seeking medical care from PHC services. The Saudi government is obliged to provide free healthcare services to all Saudi citizens through the Ministry of Health (MOH) according to Article 31 of the Saudi constitution. Therefore, the MOH provides health services at primary, secondary, and tertiary levels(4). The Saudi MOH aims to achieve PHC goals by educating the population regarding prevention and control of health problems, providing maternal and child health care, treating common health problems, providing affordable drugs, and vaccinating children against major communicable diseases(6).

In this study, 83.4% of the respondents were aware of the existence of a PHC center in their district. Similar percentages (82.0%) were revealed in studies done in India(7) and Nigeria (73.0%)(8). Although a considerable percentage of respondents (81.9%) claimed that they have a background regarding PHC services, their responses to each service were dissimilar. In this survey, immunization was the service most known to respondents (79%). This high level of awareness toward immunization is probably linked to the Saudi legislation that made immunization mandatory for issuance of birth certificates and school entry(9). Notably, corresponding results (78.2%) were found in Nigeria, which was credited to their immunization campaigns(10). Awareness of referral services was also high. The referral system in Saudi Arabia raised public awareness and emphasized the utilization of PHC centers. To gain access to secondary or tertiary hospitals, all patients need a PHC physician's assessment and referral letter(11). Other PHC components were unknown to most respondents, especially the community mental health services; only 5.8% of the respondents were aware of these services. This low result is consistent with Christiandolus' research, which reported awareness of 11.9%(8). One of the possible reasons behind such a low level of awareness involves wrong cultural beliefs regarding mental health care(12). Despite the MOH's integration of mental health into primary care in 1990(13), many people still think that mental health disorder management is confined to psychiatry clinics. This study revealed a low level of awareness regarding services such as radiological imaging, treatment of emergency cases, and anti-smoking services. This could be attributed to the unavailability of these services in most PHCCs in Al-Madinah.

In the present study, most of the monthly PHCC visitors were found to be above 55, male, married, retired, and chronically ill. Regarding the association between age and marital status with PHC utilization, approximate results have been demonstrated by other researchers. In Nigeria, Egbewale's study reported that old and married people are more prone to use PHC services(10). A similar determination was found in Brazil(14). Researchers found that never-married people utilize health services less than married people due to their higher survival time(15). Marriage can contribute indirectly in PHC utilization in many ways. Firstly, married people care for and monitor their partners' health(16). Secondly, single individuals enjoy better health status than married individuals(17). Thirdly, married people visit PHCCs for their parenthood roles, which are represented through antenatal care and childhood immunization. In this study, men used PHC services more frequently than women. However, women showed significantly higher rates of visits to their PHCC than men in other parts of the world(18-20). This can be attributed to Saudi cultural norms, like the male guardianship system and the women's driving ban (which was recently lifted). In addition, some studies reported that women did not recognize and treat their illnesses like men did(21). No significant association was seen between the educational level of respondents and the utilization of PHCC ($p>0.05$). Similar results were found in Nigeria(22). This lack of association could be attributed to respondents' similar health care-seeking behavior—regardless of different educational levels. However, a previous study done in Saudi Arabia showed that people with lower educational levels utilize PHCCs that belong to the MOH more than people with high educational levels(3). Another Saudi study revealed that highly educated patients are more prone to use a private outpatient clinic instead of a governmental PHCC(23).

Regarding the factors that influence respondents to visit PHCCs, 54.1% of the respondents stated that the close distance between their residences and the PHCCs is one of the top encouraging reasons; this is consistent with other studies that aimed to show the relationship between distance and use of health services(24-30). Most of these studies concluded an inverse relationship, thus lowering patients' utilization of healthcare services(31). A recent local study done in Riyadh also confirmed the significant impact of distance on patients' utilization. An older study in Ghana stated that most people in developing nations do not seek medical care if the distance exceeds five kilometers(31). A similar study in Papua New Guinea found that 50% of patients do not visit PHCCs if the distance exceeds 3.5 km(24).

The second influencing factor with which respondents concurred was requesting a referral letter (estimated percentage: 31.2%). Credit must be given to the Saudi MOH for establishing a referral system as defined above and continuing its efforts toward developing and enhancing its programs to achieve the best utilization of health facilities(32). Therefore, a separate, updated program named Ehalati was established and approved on April 2nd, 2012. This program is devoted to facilitating referral systems for all patients(33).

The third factor, which 21.7% of respondents found advantageous, was costless service by virtue of Saudi health care law. This is similar to a Ugandan study that identified high cost as a barrier to affording treatment in both emergent and chronic cases(34).

This research explored various reasons for non-utilization of PHC services. Dissatisfaction with health services was the most common reason preventing people from visiting and utilizing PHCC (38.3%). Our results are consistent with the results found by Alzaied et al.(35). This could include a wide spectrum of factors, such as the physical environment of PHCCs, inadequate equipment, prolonged waiting time, and unprofessional attitudes from health care providers(36). Some PHCCs are located in tenanted properties, but others are located in governmental properties, which are usually in better condition than tenanted properties. Tenanted properties are not designed for accommodating health organizations and rarely provide adequate and comfortable surroundings for health care(36,37). However, the MOH has set a goal to obtain accreditation from the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) or the Joint Commission International (JCI) for all PHCCs in Saudi Arabia by 2023(37). The purpose of CBAHI and JCI is to set standards for health care quality and patient safety.

Another factor discouraging Al-Madinah citizens is the belief that PHCCs and provided services do not meet their health needs, although our results showed that most populations lack knowledge about the services already established in PHCCs.

In the present study, 29.4% of respondents reported that the working hours of PHCCs are limited and unsuitable. Previous studies showed a high level of dissatisfaction with the working hours of PHCCs(38,39). In most public PHCCs, the hours are between 8:00 am and 4:00 pm(33). These working hours are unsuitable for most workers and students because they are engaged during the morning/daytime with their work or university commitments. Therefore, they cannot seek medical help from PHCCs(36,38). This can explain the high PHC utilization by retired people in this research. In a Saudi study, people were dissatisfied with the fixed working hours of PHCCs during the day in addition to the unavailability during weekends; they prefer private outpatient clinics instead(23).

Twenty-eight percent of our respondents believe that specialists and consultants working in secondary and tertiary hospitals are better qualified than PHC physicians. Therefore, they prefer to go directly to private hospitals instead of visiting PHCCs, assuming that PHC physicians are incapable of properly evaluating their health conditions and needs. In addition, unprofessional attitudes from health care providers and poor communication play an important role in non-utilization of PHCCs(34).

There are some limitations in this study. First, the study requires a larger sample size to ensure a representative distribution of the population. Second, using an online survey does not provide access to all residents with different financial and educational levels. Third, although the survey was distributed randomly, there were far fewer male respondents than female respondents. The survey would be more precise if males responded equally

Conclusion

This study showed a disparity of awareness levels regarding different PHC services in Al-Madinah, with immunization services being the highest and mental health care being the lowest. The utilization of PHCCs was significantly associated with age, sex, marital status, occupation, and general health status. The major reason for non-utilization was dissatisfactory health services. Therefore, regular patient satisfaction evaluations are recommended to improve the quality of provided PHC services.

The role of PHCCs should not be confined to physical territory. They should expand to their surrounding communities by holding social and health events, such as PHCC world health days

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References

1. Jahan S, Al-Saigul A. Primary Health Care Research in Saudi Arabia. International Journal of Health Sciences 2017; 11(2): 9–15.
2. Al-Sakkak M, Al-Nowaiser N, Al-Khashan H, Al-Abdrabulnabi A, Jaber R. Patient satisfaction with primary health care services in Riyadh. Saudi Med J. 2008; 29(3):432-6.
3. Al-Omar B, Bin Saeed K. Factors influencing patient's utilization of primary health care provider in Saudi Arabia. Journal of Family & Community Medicine 1998;5(2):23-30.
4. Albejaidi F. Healthcare System in Saudi Arabia: An Analysis of Structure, Total Quality Management and Future Challenges. Journal of Alternative Perspective s in the Social Sciences 2010; 2(2):794-818.
5. Statistical Yearbook - Statistical Yearbook. Available at: https://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx [Accessed 27 Aug. 2018].
6. M. Almalki, Fitzgerald G, Clark M. Health care system in Saudi Arabia: an overview. Eastern Mediterranean Health Journal 2011;17(10):784-93.
7. Community Perception and Client Satisfaction About the Primary Health Care Services in A Tribal Setting of Gujarat - India. The Internet Journal of Health. 2009;9(2).
8. Christiandolus, E. Health Consumer's Perception on Increasing Primary Health Care Services Utilization and Quality Enhancement at the Primary Health Centers in Enugu, Enugu State, Nigeria. Journal of Mass Communication and Journalism. 2012);03(01).
9. Al-Ayed I. Knowledge and practices of childhood immunization among primary health care providers in Riyadh City: Part I: Handling and administration of vaccines. J Family Community Med. 2005;9(1):15-21.
10. Egbewale B, Odu O. Perception and Utilization of Primary Health Care Services in a Semi-Urban Community in South-Western Nigeria. Journal of Community Medicine and Primary Health Care. 2012; 24(1-2):11-20

11. Mohammad AlGhamdi O, ALMalki B, EidNahhas A, ALMalki A. Rate of referral from primary health care to secondary health care among governmental hospitals in Taif governorate, KSA. International Journal of Medical Science and Public Health. 2015;4(10):1457.
12. Koenig H, Alzaben F, Sehlo M, Khalifa D, Alahwal M. Current State of Psychiatry in Saudi Arabia. J. Psychiatry in Medicine. 2013;46(3):223-242.
13. Aldabal B, Koura M, Alsowielem L. Magnitude of depression problem among primary care consumers in Saudi Arabia. International Journal of Medical Science and Public Health. 2015;4(2):205.
14. Guibu I, Moraes J, Guerra Junior A, Costa E, Acurcio F, Costa K et al. Main characteristics of patients of primary health care services in Brazil. Revista de Saúde Pública. 2017;51(suppl.2).
15. Joung I, Van Der Meer J, Mackenbach J. Marital Status and Health Care Utilization. International Journal of Epidemiology. 1995;24(3):569-575.
16. Musick K, Bumpass L. Re-Examining the Case for Marriage: Union Formation and Changes in Well-Being. J Marriage Fam. 2012;74(1):1–18.
17. Pandey M. Association between Marital Status and Health: Examining the Role of Age and Gender.
18. Bertakis K, Azari R, Helms L, Callahan E, Robbins J. Gender Differences in the Utilization of Health Care Services. J Fam Pract. 2000;49(2):147-52.
19. Carretero M, Calderón-Larrañaga A, Poblador-Plou B, Prados-Torres A. Primary health care use from the perspective of gender and morbidity burden. BMC Women's Health. 2014;14(1).
20. Cashin C. The gender gap in primary health care resource utilization in Central Asia. Health Policy and Planning. 2002;17(3):264-272.
21. Gender, women and primary health care renewal: a discussion paper. Geneva: World Health Organisation; 2010.
22. Adam V, Awunor N. Perceptions and factors affecting utilization of health services in a rural community in southern Nigeria. Journal of Medicine and Biomedical Research. 2014;13(2):117-124.
23. Al-Ghanim S. Factors Influencing the Utilisation of Public and Private Primary Health Care Services in Riyadh City. Journal of King Abdulaziz University-Economics and Administration. 2005;19(1):3-27.
24. Muller I. The effect of distance from home on attendance at a small rural health centre in Papua New Guinea. International Journal of Epidemiology. 1998;27(5):878-884.
25. Kinman E. Evaluating health service equity at a primary care clinic in Chilimarca, Bolivia. Social Science & Medicine. 1999;49(5):663-678.
26. Stock R. Distance and the utilization of health facilities in rural Nigeria. Social Science & Medicine. 1983;17(9):563-570.
27. Wilson J, Collison A, Richardson D, Kwofie G, Senah K, Tinkorang E. The maternity waiting home concept: the Nsawam, Ghana experience. International Journal of Gynecology & Obstetrics. 1997;59:S165-S172.
28. Bailey W, Phillips D. Spatial patterns of use of health services in the Kingston Metropolitan Area, Jamaica. Social Science & Medicine. 1990;30(1):1–12.
29. Ganatra B., Hirve S. Male bias in healthcare utilisation for under fives in a rural community in western India. Bulletin of World Health Organisation, 1994;72(1)101–104.
30. Oppong J, Hodgson M. Spatial accessibility to health care in Suhum District, Ghana. The Professional Geographer. 1994;46(2):199–209.
31. Buor D. Distance as a predominant factor in the utilisation of health services in the Kumasi metropolis, Ghana. GeoJournal. 2002;56(2):145-157.
32. Khoja T, Al Shehri A, Abdul Aziz A, Aziz K. Patterns of referral from health centres to hospitals in Riyadh region. Eastern Mediterranean Health Journal. 1997;3(2).
33. moh.gov.sa. Available from: https://www.moh.gov.sa/en/Pages/Default.aspx [Accessed Aug. 29th 2018].
34. Bakeera S., Wamala S, Galea S, Peterson S, Pariyo G. Community perceptions and factors influencing utilization of health services in Uganda. International journal for equity in health. 2009; 8(1)25.
35. Alzaied T, Alshammari A. An Evaluation of Primary Healthcare Centers (PHC) Services: The Views of Users. Health Science Journal. 2016;10(2):1.
36. Bakhashwain A. Acceptance and utilisation of primary health care in Jeddah City, Saudi Arabia (Doctoral dissertation, University of Hull).
37. Alfaqeeh GA. Access and utilisation of primary health care services in Riyadh Province, Kingdom of Saudi Arabia.
38. Ali M, Mahmoud, M. A study of patient satisfaction with primary health care services in Saudi Arabia. Journal of community health.1993;18(1):49-54.
39. Alhmadi H, Roland M. Quality of primary health care in Saudi Arabia: a comprehensive review. International Journal for Quality in Health Care. 2005; 17(4):331-346.

Awareness, Knowledge and Attitude of Hand Hygiene Practices among Healthcare workers in Kirkuk Pediatric Hospital

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Abstract

Introduction: The hands have a well demonstrated role in prevention of the transmission of hospital infections, which can be minimized with appropriate hand hygiene. However, compliance with hand washing is frequently sub-optimal. His study set out to evaluate the knowledge and attitudes towards hand washing of health workers in Kirkuk Pediatric Hospital.

Subjects and Methods: A cross sectional survey conducted in the period from 1st September - 30th October 2017. After approval from the research and ethical committees and after obtaining permission the hospital, a modified form of the WHO hand hygiene knowledge questionnaire for Healthcare workers that included 35 items was sent to 160 health care workers. A scoring system was devised and their knowledge and attitude were graded as good (>75%), moderate (50-74%) and poor (<50%).

Results: The majority of the respondents (85.9%) had moderate knowledge on hand hygiene. Statistically significant associations of various groups of HCW were observed with their satisfaction regarding knowledge about hand hygiene (p- value = 0.006). But the overall attitude of the respondents towards hand hygiene was not satisfactory, showing low moderate attitude only (54.73%). Their awareness of hand hygiene in preventing health care-associated infection were more than 90% of Healthcare workers and 91.9% of them can improve their compliance with hand hygiene.

Conclusion: This study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices, which may play a very important role in increasing hand hygiene compliance.

Key words: Healthcare workers hand hygiene practices in Kirkuk pediatric hospital, Awareness, knowledge and attitude of Hand Hygiene in Kirkuk Pediatric Hospital.

Introduction

Healthcare associated infection (HAI) is a "systemic or localized disease due to an adverse response to the invasion of infection agents or their toxin that is acquired after admission to the acute health care institute or facility (1)." Based on the infection type, HAIs can develop between 1-3 days after admission to hospital, 3-10 days after discharge, or within 1-3 months following a surgical procedure(2,3-5). HAIs badly affect treatment complexity, poor patient outcomes and healthcare costs. In the USA greater than 2 million individuals are influenced and greater than 100,000 individuals die yearly from HAIs, and for this reason HAI is a leading cause ofdeath. HAI increases the cost of health care services in the USA(6,7). Hospital-acquired infections still represent a problem to the health care system. HAIs result in substantial morbidity and mortalty(8). A lot hospital infections are due to pathogens transmitted ed from one patient to another by way of health workers (HCWs) who have not practiced washing of hands between patients or who do not adapt to control means like use of hand disinfection, glove use etc(9). Although Semmelweis revealed a century ago that just washing of hands was efficient in reducing the incidence of hospital infections,(10) HCW's compliance with hand washing measures remain low (11). Even the spread of multi-drug resistant pathogens has not compelled HCWs to adopt recommended practices(12). Nosocomial infections cause greater mortality, morbidity, and additional costs.

Through application of appropriate standardized prevention procedures, the risk of transmission of infectious pathogens during provision of health care services, can be kept to the lowest degree. Many well known articles reveal a disappointing compliance levels of healthcare workers (HCWs) to HAI measures (13). To overcome compliance problems it is essential to apply control and prevention strategies like adherence to disinfection guidelines.

Materials and Methods

This is a cross sectional study done in Kirkuk Pediatric Hospital and a qualitative approach was used in the study to assess the knowledge, attitude, and practice of hand hygiene among doctors, nurses and technicians who worked in this hospital during September and October 2017. A convenient sampling technique was used to recruit the participants and used across different disciplines (29, 30). The required sample size was 146 participants. A total of 160 questionnaires were distributed and 149 questionnaires were returned (the samples selected were 22 doctors, 64 nurses, 37 Technicians and 26 other staff) indicating a high response rate of 93.1 %. The other 7% did not answer the questionnaire or did not return it. The primary strategy was the drop-and-collect technique. This technique involves hand delivery and subsequent recovery of self-completion questionnaires (31). This technique had many advantages, including a high response rate and saving time. Additionally, the researcher dealt with the participants face-to-face and directly (32). By adopting this technique, a clearer picture of the study for the participants was ensured.

Knowledge was assessed using WHO's hand hygiene questionnaire for HCW. This included 34 questions with multiple choice and "yes" or "no" questions. Attitude and practice were assessed using another self-structured questionnaire which consists of 15 questions. Respondents were given the option to select on a 1- to 5-point scale between strongly agree and strongly disagree. A score of 0 was given for negative attitudes and poorpractices. 1 point was given for each correct response to positive attitudes and good practices so that a maximum score for attitude was 5 and for practice it is five. Care-related HH practices were used to assess HH compliance: before touching a patient, before performing an aseptic/clean procedure, after body fluid exposure risk, after touching a patient, and after touching patient surroundings. Data was analyzed using SPSS version 23 software.

Results

One hundred and forty nine of the 160 attendees returned the survey; a response rate of 93.1%. Respondents were male to female (47.7% to 52.3% respectively), reflecting a predominance of females. Their mean age was 36.84 years. Most were registered nurses (43.0%), Doctors (14.8%), Technicians (24.8%) and others (17.4%). Higher incidence of compliance with hand hygiene was found in the emergency unit and premature units which were (100% and 95.8% respectively) and lowest in the nutritional unit (28.6%).

Discussion

Poor hand washing behavior is one of the risky health behaviours among adolescents which may lead to various infections and contamination and consequently affect health (33-35).

Hand hygiene is usually associated with hand washing in the medical care field. The health workers can use antimicrobial soap or an alcohol based hand sanitizer to wash hands. In this study, the majority (85.9%) of the HCW routinely used an alcohol-based hand rub for sanitising their hands. Previous results were found by Maheshwari et al (36) among HCW in Bhopal hospital. About 91.9% of HCW correctly opined that hand hygiene, which means unclean hands of HCW, were the principle route of cross-transmission of potentially harmful micro-organisms between patients in a health care facility. The findings of the current study agree with Nair et al's findings (37) among nursing students of Raichur medical college. In the current research, 46.3% of HCW assume that the source of micro-organisms responsible for infections associated with health care were micro-organisms normally present on the patient. That is in agreement with the research where that was perceived as the principle source in articles (36-37). CDC and WHO guidelines advised alcohol-based hand rub as a standard of care compared to soap and water, especially in heavy workload places. It should be easily accessible and less irritating to skin and saves time.

Table 1: Socio-demographic features

Characters	Doctor	%	Nurse	%	Technician	%	Others	%	Total	%
Male	14	19.7	30	42.4	19	26.7	8	11.3	71	100.0
Female	8	10.3	34	43.6	18	23.1	18	23.1	78	100.0
Total	22	14.8	64	43.0	37	24.8	26	17.4	149	100.0

Table 2: Knowledge of hand hygiene in preventing health care-associated infection according to type of profession

	High knowledge	%	Low knowledge	%	Total
Doctor	19	86.4	3	13.6	22
Nurse	60	93.8	4	6.3	64
Technician	34	91.9	3	8.1	37
Others	24	92.3	2	7.6	26
Total	137	91.9	11	8.0	148

Table 3: Awareness of Hand Hygiene in Preventing Health Care-associated Infection

	Improve compliance	%	Not improve compliance	%	Total
Doctor	21	95.5	1	4.5	22
Nurse	58	90.6	6	9.4	64
Technician	33	89.2	4	10.8	37
Others	25	96.2	1	3.8	26
Total	137	91.9	12	8.1	149

Table 4: Awareness of use of Alcohol hand rubs to prevent transmission of germs to the health-care worker

	Awareness of use of ABHR	%	Unawareness of use of ABHR	%	Total
Doctor	17	77.3	5	22.7	22
Nurse	35	54.7	29	45.3	64
Technician	18	48.6	19	51.4	37
Others	7	26.9	19	73.1	26
Total	77	51.7	72	48.3	149

Chi-square = 12.5 p-value = 0.006

Table 5: Factors preventing (HCW) from performing hand hygiene as recommended for comparison between groups using chi-square

	Factors prevent (HCW) from performing hand hygiene				
	Yes	%	No	%	p-value
Lack of time/ too busy	42	28.2	107	71.8	0.0001
Lack of alcohol-based hand rub	62	41.6	87	58.4	0.08
Forgetfulness	54	36.2	95	63.8	0.007
Nobody else does	11	7.4	138	92.6	0.0001
Lack of towels	77	51.7	72	48.3	*
It's not important	10	6.7	139	93.3	0.0001
Use gloves instead	95	63.8	54	36.2	0.03
Short patient contact	28	18.8	121	81.2	0.0001
Total	379		1192		

In cases of dirty hands (soiled with blood or body fluids), soap and water was used in the current study; only 36.2% used hand washing, but (52.3%) of HCW use alcohol rub instead of hand washing. In this research still 49% of HCW thought that alcohol hand rubs cannot prevent transmission of germs to the HCW whereas hand disinfectants containing alcohol are an influential alternative to standard soap and water in other situations (38).

HCW don't use alcohol hand rubs because the majority of them cited absence of resources that prevented hand hygiene performance with (63.8%) citing they use gloves instead of alcohol hand rubs; 51.7% of HCW claimed absence of towels, others (41.6%) insisted on absence of alcohol-based hand rub, another 28.2% mentioned the absence of time, another 18.8% claimed short patient contact; 36.2% of HCW cited forgetfulness, (7.4%) of HCW claimed 'nobody else does', finally (6.7%) cited that it is not important. The previously mentioned obstacles were found in many articles, specifically in resource limited settings (39). All these obstacles may influence the compliance with alcohol-based hand rub and sometimes shifting to hand wash. It should be mentioned that hand washing with soap and water for a short time rather than the proper recommendedtime can be harmful because a lot of research conducted in intensive care units found that HCW failed to wash their hands as per the recommended times, which was responsible for spread of infection due to multi drug resistant organisms (40).

Conclusion

The current study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices, which may play a very important role in increasing hand hygiene compliance and there is a need to improve the clinical daily routines for nurses and doctors in order to reduce cross transmission of infections among patients.

References

1. Centers for Disease Control and Prevention. CDC/ NHSN Surveillance Definitions for Specific Types of Infection. CDC website. 2014.
2. Edmond M, Eickhoff TC. Who is steering the ship? External influences on infection control programs. Clin Infect Dis 2008; 46 (11):1746-50.
3. Collins A. "Preventing health care-associated infections," in: Patient Safety and Quality: An Evidence-Based Handbook for Nurses, Vol. 2 Hughes RG, ed. AHRQ Publication No. 08-0043 ed. Rockville, MD: Agency for Healthcare Research and Quality (US), 2008; 547-75.
4. Custodio H, Jaimovich D, Windle M, et al. Hospital-acquired infections. 2014.
5. Kouchak F, Askarian M. Nosocomial infections: the definition criteria. Iran J Med Sci 2012; 37(2):72-73.
6. Inweregbu K, Dave J, Pittard A. Nosocomial infections. Continuing Education in Anaesthesia, Critical Care and Pain 2005; 5 (1):14-17.
7. Scott II R. The direct medical costs of healthcare-associated infections in U.S. hospitals and the benefits of prevention. CDC website. 2009.
8. Jarvis WR. Selected aspects of the socioeconomic impact of nosocomial infections: Morbidity, mortality, cost and prevention. Infect Control Hosp Epidemiol 1996;17:552-7.
9. Horn WA et al. Microbial flora on the hands of health care personnel: Differences in composition and antibacterial resistance. Infect Control Hosp Epidemiol 1988;9:189-93.
10. Albert RK, Condie F. Hand-washing patterns in medical intensive-care units. N Engl J Med 1981;24:1465-6.
11. Kristensen MS, Wernberg NM, Anker-Moller E. Healthcare workers' risk of contact with body fluids in a hospital: The effect of complying with the universal precautions policy. Infect Control Hosp Epidemiol 1992;13:719-24.
12. Meengs MR, Giles BK, Chisholm CD, Cordell WH, Nelson DR. Handwashing frequency in an emergency department. J Emerg Nurs 1994;20:183-8.
13. World Health Organization. WHO Guidelines on Hand Hygiene in Health Care: First global safety challenge: clean care is safe care. Geneva: WHO 2009
14. Larson E. A cause link between hand washing and risk of infection? Examination of the evidence. Infect Control Hosp Epidemiol, 1988, 9:28-36.
15. CDC Guidelines for hand washing and hospital environmental control. Amer J Infect Control, 1986, 7:231-242.
16. Pittet D et al. Evidence-based model for hand transmission during patient care and the role of improved practices. The Lancet infectious diseases. 2006;6 (10):641-52.
17. Jumaa PA. Hand hygiene: simple and complex. International Journal of Infectious Diseases. 2005 Jan 31;9(1):3-14.
18. Musoke, R., and Revathi, G. Emergence of multidrug resistant Gram negative organisms in a neonatal unit and the therapeutic complications. J. Trop. Pediatr. 2000; 46:86-91.
19. Price PB. The bacteriology of normal skin: a new quantitative test applied to a study of the bacterial flora and the disinfectant action of mechanical cleansing. Journal of Infectious Diseases, 1938, 63:301–318.
20. Weber D.J et al. The Role of the Surface Environment in Healthcare-Associated Infections. Current Opinion in Infectious Diseases 2013, 26, 338-344.
21. Ellingson, K., et al. Strategies to Prevent Healthcare-Associated Infections through Hand Hygiene. Infection Control & Hospital Epidemiology 2014, 35, 937-960. http://dx.doi.org/10.1086/651677
22. World Health Organization. Good Hand Hygiene by Health Workers Protects Patients from Drug Resistant Infections. 2014
23. Pittet D, Dharan S, Touveneau S, et al. Bacterial contamination of the hands of hospital staff during routine patient care. Archives of Internal Medicine, 1999, 159:821–826.
24. Pessoa-Silva CL, Dharan S, Hugonnet S, et al. Dynamics of bacterial hand contamination during routine neonatal care. Infection Control and Hospital Epidemiology, 2004, 25:192–197.

25. Patrick DR, Findon G, Miller TE. Residual moisture determines the level of touch contact-associated bacterial transfer following hand washing. Epidemiology and Infection,1997, 119:319–325.
26. Montes LF, Wilborn WH. Location of bacterial skin flora. British Journal of Dermatology, 1969, 81:23–26.
27. Lark RL, VanderHyde K, DeebGM et al. An outbreak of coagulase-negative staphylococcal surgical-site infections following aortic valve replacement. Infection Control and Hospital Epidemiology,2001, 22:618–623
28. Pittet D, Allegranzi B, Sax H, et al. Evidence-based model for hand transmission during patient care and the role of improved practices. Lancet Infectious Diseases, 2006, 6:641- 652.
29. Polit, D.F. and Beck, C.T. Nursing Research: Principles and Methods. Seventh Edition, Lippincott Williams & Wilkins, Philadelphia. 2004
30. Creswell, J.W. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Second Edition, Sage Publications, Thousand Oaks. 2013
31. Brown, S. Drop and Collect Surveys: A Neglected Research Technique. Marketing Intelligence and Planning 1987;5:19-23.
32. Baker, M. Business and Management Research: How to Complete Your Research Project Successfully. Westburn Publishers Ltd., Helensburgh. 2003
33. Ashoor R Sarhat et al. Risky Health Behaviors and Protective Factors among Secondary School Students In Tikrit. Research Center of childhood and motherhood Year Book 2010, 5: 317.
34. Abid A Salman, Ashoor R Sarhat, Hind K Sabih. Risky Health Behaviors Knowledge Gained in Secondary School in Tikrit City. Tikrit Medical Journal 2011; 17 (1): 48-52.
35. Ashoor R Sarhat, Abid A Salman, Hind K Sabih. Risky Health Behaviors among Teaching Institutes Students in Tikrit. Medical Journal of Tikrit 2012;18 (182): 282-6.
36. Maheshwari V, Kaore NCM, Ramnani VK, Gupta SK, Borle A, Kaushal R. A Study to Assess Knowledge and Attitude Regarding Hand Hygiene amongst Residents and Nursing Staff in a Tertiary Health Care Setting of Bhopal City. Journal of Clinical and Diagnostic Research. 2014;8(8):4-7.
37. Nair SS, Hanumantappa R, Shashidhar Gurushantswamy Hiremath, Mohammed Asaduddin Siraj, and Pooja Raghunath. Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India. ISRN Preventive Medicine 2014,1- 4.
38. Center for Disease Control, "Guideline for hand hygiene in health-care settings. Recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force. Society for healthcare epidemiology of America/ association for professionals in infection control/infectious diseases society of America," morbidity and Mortality Weekly Report Recommendations and Reports.2002;51(16):1-45.
39. Rosenthal VD, Maki DG. The impact of open and closed infusion systems on rates of central venous catheter–associated bacteremia. Am J Infect Control 2004; 32:135-141.
40. Metintas S, Akgun Y, Durmaz G, Kalyoncu C. Prevalence and characteristics of nosocomial infections in a Turkish university hospital. American journal of infection control. 2004 Nov 30; 32(7):409-13.

Epidemiology of falls among elderly people attending primary healthcare centers in Abha City, Saudi Arabia

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Abstract

Objectives: To assess the prevalence and determinants of falls among people aged 65 years or more attending primary health care centers in Abha City, 2018.

Methodology: A cross–sectional study was carried out in Abha City, Saudi Arabia. It included a representative sample of 402 elderly participants aged above 65 years who attended five selected primary health care (PHC) centers. A self-administered structured questionnaire in simple Arabic language was designed by the researchers and was used for data collection. It included socio-demographic variables, and variables related to falls (e.g. disease history, currently received medications, physical functional capacity assessment and falls history during the past 12 months).

Results: Participants' age ranged between 66 and 130 years (Mean± SD= 75.9±10.3 years). History of falling was reported among 58.5%. Multivariate logistic regression analysis revealed that never worked elderly persons were less likely to have falls compared to retired persons (adjusted odds ratio "AOR"=0.61, p=0.032). Patients with cardiac disease were at significant risk (AOR=2.19, p=0.021). Those with vertigo were at almost double risk to have a fall (AOR=2.40, p<0.001). Elderly persons with sensory visual problems were at a significant risk for fall (AOR=1.61, p=0.043). Those who needed a supporting aid to walk were at almost 3-folds risk to have falls (AOR=3.25; p<0.001).

Conclusions: Falls constitute a common health problem affecting more than half of elderly people attending PHC centers in Abha City, despite the fact that they can be easily prevented.

Key words: Falls, Elderly, Risk factors, Saudi Arabia.

Introduction

In 2012, there were around 810 million elderly people alive worldwide; two-thirds of those were living in developing countries. It was postulated that this number will reach two billion by 2050(1). As for Saudi Arabia, in 2012, there were 4.9% (1.4 million) of the Saudi population over the age of 60 years(2) .The same report predicted that this number will reach up to 21.8% (10 million) by 2050(2).

Fall is defined as: “coming in contact with the ground or another surface, suddenly and without expectation”(3). Among older individuals, falls are common. Injuries that result from these falls can be life threatening. Moreover, with a foreseeable increase in the elderly group worldwide, falls and their resultant injuries in the elderly are becoming an important public health concern. This is a significant chunk of the population with health care needs on the increase, especially with outcomes from falls. Hence a need, not only to address risk factors, but also to bring to light interventions that work and improve upon overall quality of life for the elderly(4).

Falls and fall-related injuries among elderly people are major issues for health and social care providers worldwide. This is due to the rapid increases in life expectancy observed during the twentieth century. Fall-induced injuries are increasing more rapidly than can be accounted for by the increase in the elderly population. Fall causes considerable costs as well as physical and social costs(5).

The elderly experience their health differently from during their youth. Those who are more prone to falls usually suffer from more than one impairment in posture and balance, cognition, and overall physical health (6).

The ageing process results in progressive deterioration of the visual, vestibular, somatosensory systems, reduced speed of central processing and reductions in muscle strength. These physiologic changes are often accompanied by a generalized slowing of postural responses and altered movement patterns for older adults compared with young adults(7). Moreover, some factors are normally associated with falls among elderly are due to diseases and drugs side effects, although there are other factors like environmental factors(8).

Falling, or a fear of falling, has considerable implications on an elderly person’s lifestyle, resulting in decreased activity and mobility, and an increase in dependence affecting the person’s quality of life(9). Elderly persons who have fallen once or twice are likely to fall again within a year(10).

Falls and fall-induced injuries in elderly people are a major public health problem in modern societies with aging populations. Injuries, in turn, are the fifth leading cause of death in elderly people, and most of these fatal injuries are related to falls(11).Moreover, fall-induced injuries are increasing more rapidly than can be accounted for by the increase in the elderly population. Fall causes considerable costs as well as physical and social costs(12).

The magnitude of falls among the elderly in Malaysia was 4.07%,(13) 11.1% in China,(14) 8% in Japan,(15) and 19.3% in Hong Kong,(16) while in Riyadh, 49.9% of elderly Saudis had experienced one or more falls during a 12-month period(2).

Falls are the major reason for hospital admission or a residential care setting, even when no serious injury has occurred. Falls are the most serious and frequent home accident among elderly people(5). Falls can cause various serious outcomes in elderly persons, especially those in health care facilities. Examples of these outcomes include fall-related fractures of the lower extremities which will eventually lead to dependency. Having such an outcome will lead to prolonged hospitalizations and increase in healthcare costs, affecting the economy as a whole(17).

Falls among the elderly may also result in a post-fall syndrome that includes dependence, loss of autonomy, confusion, immobilization and depression. Moreover, falls among the elderly represent a major economic and social problem. This decreases their quality of life both at home and in institutional care settings, which will lead to a further restriction in daily activities(18).

The World Health Organization (WHO) reported that falls are the second leading cause of accidental or unintentional injury deaths worldwide. Each year an estimated 646,000 individuals die from falls globally of which over 80% are in low- and middle-income countries. Adults older than 65 years of age suffer the greatest number of fatal falls. Each year, 37.3 million falls occur that are severe enough to require medical attention(19).

Kannus et al. reported that the number of fall-induced deaths among the elderly shows a clear increase. Therefore, detailed epidemiological studies, in addition to investigations of possible behavioral, environmental, and biological predisposing factors and dynamics, are needed to better understand this phenomenon. There is a clear increase of falls in both women and men. For this reason, falls-prevention and interventions should be urgently implemented to control the problem(11).

The high risk of falls among elderly people can stem from the increased use of medications because of the many health problems acquired in the aged population which leads to drug-drug interactions. Another reason for the increase in falls is cognitive decline in this population and a greater use of psychotropic medications(20). Therefore, the elderly need to be educated and motivated on fall prevention strategies to help reduce the incidence of falls(17).

Since there have been reports of an increased risk of falls in people aged 65 and older, it is necessary to put fall-prevention interventions in place, so as to try to reduce the incidents(20). Moreover, the WHO noted that fall prevention strategies should emphasize education of elderly, training of caregivers and health care providers, creating safer environments, prioritizing fall-related research and establishing effective policies to reduce risk(19).

This study aimed to explore magnitude and epidemiology of falling among elderly people attending PHC centers in Abha City.

Methods

This research followed a cross-sectional design. It was conducted in Abha City, Saudi Arabia. Five PHC centers were randomly selected to conduct the present study. All elderly (aged >65 years) attendants to the study PHC centers constituted the study population.

The inclusion criteria for the present study were being an elderly (aged >65 years) and being registered at a PHC center in Abha City. The exclusion criteria were being younger than 65 years or being a guest, i.e., not registered at the study PHC center.

Based on thorough review of literature, the researchers constructed a structured, self-administered questionnaire in a simple Arabic language. The questionnaire comprised the following two parts:

I. Socio-demographic characteristics: Age, gender, residence, nationality, educational status, occupation, marital status, and cohabitation status.

II. Variables about factors related to falls:

- Disease history: Presence of chronic diseases (e.g., diabetes, hypertension, osteoarthritis, cardiac or neurological disorders), gait or imbalance disorders, sensory (visual or auditory) problems.
- Currently received medications.
- Physical functional capacity assessment (23).
- History of falls during the past 12 months.

A pilot study was conducted on 15 subjects to test the wording, clarity and reliability of the questions. The results of this pilot study helped in re-phrasing, adding or omitting some questions. The collected data within the pilot study were not included into the main study. By way of feedback, the questionnaire was clear and understandable.

The researchers fulfilled all the required official approval. Interviews were applied by trained interviewers. During visits to the study PHC centers, elderly participants were briefed regarding objectives of the research. They were requested to fill out the study questionnaire in the presence of the interviewers. Participants were assured that there would be no negative consequences if they decided to participate or not to participate in this study. They were also assured about the anonymity and full confidentiality of their responses. Their verbal consent to participate was then requested.

Collected data were verified by hand then coded before computerized data entry. The Statistical Package for Social Sciences (IBM-SPSS version 25.0) was used for data entry and analysis. Descriptive statistics (e.g. number, percentage, range, mean, standard deviation) and inferential statistics (e.g., $X2$) were applied. Multivariate logistic regression analysis was performed for significant variables of bivariate analysis to control for confounding effect. Adjusted odds ratio (AOR) and their 95% confidence interval (CI) were computed and p-values <0.05 were considered as statistically significant.

This study was carried out at the full expense of the researchers, with no conflict of interest.

Results

Four hundred and two elderly patients participated in the study. Their age ranged between 65 and 97 years with a mean±standard deviation (SD) of 75.9±10.3 years. The other personal characteristics are summarized in Table 1. Slightly more than half of them (51.2%) were males. The majority were Saudis (96%). Almost two-thirds of the participants (66.9%) were illiterate and married (65.2%) and 58.3% of the participants had never worked . Regarding living status, 56% of the elderly people lived with their spouse and children whereas only 8.7% lived alone.

Table 2 shows that the majority of participants reported a history of at least one chronic disease (80.6%). The commonest disease was diabetes mellitus (50.7%), followed by hypertension (49.3%), osteoarthritis (23.1%) and cardiac diseases (16.4%). Half of the participants had imbalance disorder, whereas vertigo was observed among 47% of them. Sensory auditory problems were reported among 35.3% of participants, whereas sensory visual problems were observed among 54%. History of drug intake was mentioned by most of the participants (79.4%). The commonest taken were anti-hypertensives (49.5%) and anti-diabetics (47.8%), followed by psychiatric drugs (16.4%) and diuretics (11.2%).

Table 3 shows that home activities and shopping were performed by 67.9% and 60% of participants, respectively. Need a companion and supporting aid to walk were stated by 44.8% and 61.2%, respectively. Daily climbing stairs was mentioned by 60.4%, whereas history of using grab-bars at home was mentioned by 52.2%.

Table 4 shows that history of falling was reported by 58.5%. Among these , it was once, among 71.5% or more than once among 28.5%. Regarding place of falling, indoors was reported by 65.5%, outdoors by 28.5% or both indoors and outdoors by 6%. Concerning time of falling, morning was stated by 67.7%, at night, by 24.7%, or both at morning and night by 7.7% of participants.

Table 5 shows that the highest falling incidents were observed among persons aged between 76 and 85 years (68.1%), whereas the lowest were observed among those aged between 66 and 75 years. This difference was statistically significant, p=0.017. There was a statistically significant association between educational level of the participants and their history of falls as 63.4% of illiterate persons compared to 40.7% and 46.2% of those of intermediate school and university graduation, respectively had a history of falls, p=0.014. Retired persons had more history of falls compared to those who had never worked (63.2% versus 50.9%). This difference was statistically

significant, p=0.015. Concerning the marital status, the highest falls incidents were reported among widowed persons (69%), whereas the lowest were reported among divorced persons (46.2%), p=0.043. Gender, nationality and living status of the participants were not significantly associated with history of falls.

Table 6 shows that cardiac patients had more history of falls compared to non-cardiac persons (75.8% versus 55.1%), p=0.002. Stroke patients had significantly more incidents of falls compared to non-stroke persons (87.5% versus 56.6%), p=0.002. Participants with imbalance disorders had more incidents of falls compared to those without these disorders (70.6% versus 46.3%), p<0.001. Also, participants with vertigo had more fall incidents compared to those without vertigo (74.1% versus 44.6%), p<0.001. Patients with sensory visual problems had more fall incidents compared with those without such problems (65.4% versus 50.3%), p=0.007. Patients with diabetes, hypertension, osteoarthritis, epilepsy, and sensory auditory problem were not significantly associated with more incidents of falls.

Table 7 shows that participants on daily medications had more history of falls compared to those without daily medication history (61.4% versus 47%), p=0.017. Patients on medications for analgesics, anti-coagulants, thyroid drugs, drugs for asthma, Alzheimer, etc., were significantly associated with more history of falls compared to those without such medications (78.6% versus 57%), p=0.025. History of daily intake of anti-diabetic, anti-hypertensive, anti-arrhythmic, psychiatric or diuretic medications was not significantly associated with history of falls.

Table 8 shows that participants who reported history of going shopping by themselves had significantly less history of falls compared to their counterparts (53.1% versus 66.5%), p=0.008. Elderly persons who need a companion or a supporting aid to walk had more incidents of falls compared to others, p<0.001. Elderly persons who used grab-bars at home reported more incidents of falls compared to those who did not use them (63.8% versus 52.6%), p=0.023. Doing home activities and daily climbing stairs were not significantly associated with history of falls.

Table 9 shows the multivariate logistic regression analysis of study variables. It revealed that, after controlling for confounding, neverworked elderly persons had less history of fall compared to retired persons (Adjusted odds ratio “AOR”=0.61; 95% confidence interval “CI”=0.38-0.96, p=0.032). Patients with cardiac disease were significantly associated with more falls compared to those without cardiac diseases (AOR=2.19; 95% CI=1.13-4.25, p=0.021). As opposed to patients without vertigo, those with vertigo were twice more associated with falls (AOR=2.40; 95% CI=1.51-3.81, p<0.001). Considering elderly persons without sensory visual problems as a reference category, those with sensory visual problems had significantly more falls (AOR=1.61; 95% CI=1.01-2.54, p=0.043). Elderly persons who need a supporting aid to walk had almost 3-folds more falls compared to those without the need of help to walk (AOR=3.25; 95% CI=2.04-5.17, p<0.001). Age, educational level, marital status, chronic diseases, stroke, imbalance disorder, medications, go shopping, need a companion to walk with and using grab-bars at home were not significantly associated with more falls.

Table 1: Socio-demographic characteristics of elderly participants, primary healthcare centers, Abha City

Characteristics	Frequency	Percentage
Age (years)		
• <75	231	57.4
• 76-85	113	28.1
• 86-95	36	9.0
• >95	22	5.5
Range	66-97	
Mean±SD	75.9±10.3	
Gender		
• Male	206	51.2
• Female	196	48.8
Nationality (n=399)		
• Saudi	283	96.0
• Non-Saudi	16	4.0
Educational level (n=401)		
• Illiterate	268	66.9
• Primary school	74	18.5
• Intermediate school	27	6.7
• Secondary school	19	4.7
• University	13	3.2
Job status (n=396)		
• Retired	165	41.7
• Never worked	231	58.3
Marital status		
• Married	262	65.2
• Not married	11	2.7
• Widowed	116	28.9
• Divorced	13	3.2
With whom are you living?		
• Spouse only	43	10.7
• Spouse and children	225	56.0
• Alone	35	8.7
• Children/relatives	99	24.6

Table 2: Participants' medical history, Abha City

Medical history	Frequency	Percentage
Chronic diseases	324	80.6
• Diabetes mellitus	204	50.7
• Hypertension	198	49.3
• Osteoarthritis	93	23.1
• Cardiac diseases	66	16.4
• Stroke	24	6.0
• Epilepsy	4	1.0
Imbalance disorder	201	50.0
Vertigo	189	47.0
Sensory auditory problems	142	35.3
Visual problems	217	54.0
Daily medication intake:	319	79.4
• Anti-hypertensives	199	49.5
• Anti-diabetes	192	47.8
• Psychiatric drugs	66	16.4
• Diuretics	45	11.2
• Anti-arrhythmia	17	4.2
• Others	28	7.0

Table 3: Physical functional capacity of elderly participants, primary healthcare centers, Abha City

Physical functional capacity	Frequency	Percentage
Doing home activities	273	67.9
Shopping	241	60.0
Need a companion to walk	180	44.8
Need a supporting aid to walk	246	61.2
Daily climbing stairs	243	60.4
Using grab-bars at home	210	52.2

Table 4: History of previous falling of elderly participants within the last 12 months, Abha City

History of falling	Frequency	Percentage
Falling within the last 12 months	235	58.5
Frequency:		
• Once	168	71.5
• More than once	67	28.5
Place of falling:		
• Indoor	154	65.5
• Outdoor	67	28.5
• Both indoor and outdoor	14	6.0
Time of falling:		
• Morning	159	67.7
• Night	58	24.7
• Both	18	7.7

Table 5: Association between participants' socio-demographic characteristics and history of falls during the last 12 months

Sociodemographic Characteristics	Fall		χ^2 (p-value)
	No (167) No. (%)	Yes (n=235) No. (%)	
Age (years)			
• <75 (n=231)	111 (48.1)	120 (51.9)	
• 76-85 (n=113)	36 (31.9)	77 (68.1)	
• 86-95 (n=36)	12 (33.3)	24 (66.7)	5.66
• >95 (n=22)	8 (36.4)	14 (63.6)	(0.017*)
Gender			
• Male (n=206)	92 (44.7)	114 (55.3)	1.69
• Female (n=196)	75 (38.3)	121 (61.7)	(0.193)**
Nationality (n=399)			
• Saudi (n=383)	157 (41.0)	226 (59.0)	0.51
• Non-Saudi (n=16)	8 (50.0)	8 (50.0)	(0.473)**
Educational level (n=401)			
• Illiterate (n=268)	98 (36.6)	170 (63.4)	
• Primary school (n=74)	36 (48.6)	38 (51.4)	
• Intermediate school (n=27)	16 (59.3)	11 (40.7)	
• Secondary school (n=19)	9 (47.4)	10 (52.6)	6.05
• University (n=13)	7 (53.8)	6 (46.2)	(0.014)*
Job status (n=396)			
• Retired (n=231)	85 (36.8)	146 (63.2)	5.98
• Not working (n=165)	81 (49.1)	84 (50.9)	(0.015)**
Marital status			
• Married (n=262)	120 (45.8)	142 (54.2)	
• single (n=11)	4 (36.4)	7 (63.6)	
• Widowed (n=116)	36 (31.0)	80 (69.0)	8.16
• Divorced (n=13)	7 (53.8)	6 (46.2)	(0.043)*
With whom are you living?			
• Spouse only (n=43)	18 (41.9)	25 (58.1)	
• Spouse and children (n=225)	100 (44.4)	125 (55.6)	
• Alone (n=35)	10 (28.6)	25 (71.4)	3.40
• Children/relatives (n=99)	39 (39.4)	60 (60.6)	(0.335)*

*Chi-square for trend **Pearson's Chi-square

Table 6: Association between participants' medical history and their history of falls during the last 12 months

Medical history	Fall		χ^2 (p-value)
	No (167) No. (%)	Yes (n=235) No. (%)	
Chronic diseases			
• No (n=78)	43 (55.1)	35 (44.9)	7.36
• Yes (n=324)	124 (38.3)	200 (61.7)	(0.007)*
Diabetes mellitus			
• No (n=198)	87 (43.9)	111 (56.1)	0.92
• Yes (n=204)	80 (39.2)	124 (60.8)	(0.337)*
Hypertension			
• No (n=204)	90 (44.1)	114 (55.9)	1.13
• Yes (n=198)	77 (38.9)	121 (61.1)	(0.288)*
Osteoarthritis			
• No (n=309)	126 (40.8)	183 (59.2)	0.32
• Yes (n=93)	41 (44.1)	52 (55.9)	(0.570)*
Cardiac diseases			
• No (n=336)	151 (44.9)	185 (55.1)	9.73
• Yes (n=66)	16 (24.2)	50 (75.8)	(0.002)*
Stroke			
• No (n=378)	164 (43.4)	214 (56.6)	
• Yes (n=24)	3 (12.5)	21 (87.5)	0.002**
Epilepsy			
• No (n=398)	166 (41.7)	232 (58.3)	
• Yes (n=4)	1 (25.0)	3 (75.0)	0.448**
Imbalance disorders			
• No (n=201)	108 (53.7)	93 (46.3)	24.59
• Yes (n=201)	59 (29.4)	142 (70.6)	(<0.001)
Vertigo			
• No (n=213)	118 (55.4)	95 (44.6)	35.82
• Yes (n=189)	49 (25.9)	140 (74.1)	(<0.001)
Sensory auditory problems			
• No (n=260)	117 (45.0)	143 (55.0)	3.62
• Yes (n=142)	50 (35.2)	92 (64.8)	(0.057)*
Sensory visual problems			
• No (n=185)	92 (49.7)	93 (50.3)	7.36
• Yes (n=217)	75 (34.6)	142 (65.4)	(0.007)*

*Pearson's Chi-square **Fisher Exact Test

Table 7: Association between participants' medication history and their history of falls during the last 12 months

Medications Intake	Fall		χ^2 (p-value)
	No (167) No. (%)	Yes (n=235) No. (%)	
Medications			
• No (n=83)	44 (53.0)	39 (47.0)	5.67
• Yes (n=319)	123 (38.6)	196 (61.4)	(0.017)*
Anti-hypertensive drugs			
• No (n=203)	90 (44.3)	113 (55.7)	1.32
• Yes (n=199)	77 (38.7)	122 (61.3)	(0.251)
Anti-diabetics			
• No (n=210)	92 (43.8)	118 (56.2)	0.93
• Yes (n=192)	75 (39.1)	117 (60.9)	(0.335)*
Diuretics			
• No (n=357)	150 (42.0)	207 (58.0)	0.30
• Yes (n=45)	17 (37.8)	28 (62.2)	(0.587)*
Psychiatric drugs			
• No (n=336)	142 (42.3)	194 (57.7)	0.44
• Yes (n=66)	25 (37.9)	41 (62.1)	(0.509)*
Anti-arrhythmic drugs			
• No (n=385)	163 (42.3)	222 (57.7)	
• Yes (n=17)	4 (23.5)	13 (76.5)	0.097**
Others°			
• No (n=374)	161 (43.0)	213 (57.0)	5.01
• Yes (n=28)	6 (21.4)	22 (78.6)	(0.025)*

*Pearson chi-square **Fisher exact test

°Others: Analgesics, anti-coagulants, thyroid drugs, drugs for asthma, Alzheimer, etc.

Table 8: Association between participants' physical functioning capacity and their history of falls within the last 12 months

Physical functional capacity	Fall		χ^2 (p-value)*
	No (167) No. (%)	Yes (n=235) No. (%)	
Doing home activities			
• No (n=129)	46 (35.7)	83 (64.3)	2.71
• Yes (n=273)	121 (44.3)	152 (55.7)	(0.100)
Go shopping			
• No (n=161)	54 (33.5)	107 (66.5)	7.08
• Yes (n=241)	113 (46.9)	128 (53.1)	(0.008)
Need a companion to walk			
• No (n=222)	119 (53.6)	103 (46.4)	29.70
• Yes (n=180)	48 (26.7)	132 (73.3)	(<0.001)
Need a supporting aid to walk			
• No (n=155)	98 (63.2)	57 (36.8)	48.42
• Yes (n=246)	69 (28.0)	177 (72.0)	(<0.001)
Daily climbing stairs			
• No (n=159)	64 (40.3)	95 (59.7)	0.18
• Yes (n=243)	103 (42.4)	140 (57.6)	(0.671)
Using grab-bars at home			
• No (n=192)	91 (47.4)	101 (52.6)	5.19
• Yes (n=210)	76 (36.2)	134 (63.8)	(0.023)

*Pearson chi-square

Table 9: Predictors of fall among the elderly participants, primary healthcare centers, Abha city: Results of multivariate logistic regression analysis

	B	SE	AOR	95%CI	p-value
Job status (n=396)					
Retired (n=231)[a]			1.0	---	
Not working (n=165)	-0.502	0.234	0.61	0.38-0.96	0.032
Cardiac diseases					
No (n=336) [a]			1.0	---	
Yes (n=66)	0.783	0.339	2.19	1.13-4.25	0.021
Vertigo					
No (n=213) [a]			1.0	---	
Yes (n=189)	0.875	0.236	2.40	1.51-3.81	<0.001
Sensory visual problems					
No (n=185) [a]					
Yes (n=217)			1.0	---	
	0.473	0.234	1.61	1.01-2.54	0.043
Need a supporting aid to walk					
No (n=155) [a]			1.0	---	
Yes (n=246)	1.179	0.237	3.25	2.04-5.17	<0.001

a: Reference category B: Slope SE: Standard error
AOR: Adjusted odds ratio CI: Confidence interval

Variables of age, educational level, marital status, chronic diseases, stroke, imbalance disorder, medications, going shopping, need a companion to walk and using grab-bars at home were removed from the final logistic regression model (i.e., not significant)

Discussion

In the current study, falling was reported among more than half of the elderly people attending primary healthcare centers (58.5%). It occurred more than once among 28.5% of them. A similar figure has been reported in Riyadh, Saudi Arabia by Alshammari, et al. (57.7%)(24). However, the figures reported in this study and in another Saudi study carried out in Riyadh are higher than those reported in other Gulf countries, such as in Qatar (34%), being once among 47% of them and twice or more among 53% of them(25). Additionally, these figures are almost double those reported in other areas of the world such as Brazil,(26) United States, (27) India (28) and Japan (29) . In an earlier study conducted in the Eastern Mediterranean Region, the rate of falls among elderly ranged between 30% and 40% annually (30).

The high occurrence of falls reported among the Saudi elderly population could be a reflection of the lack of physical activity and their sedentary life which represents a serious health risk, particularly among elderly people(31).

Regarding place of falling, indoor falls were reported by most elderly (71.5%) whereas outdoor falls were reported by about one third. This finding is in agreement with that of Dhargave et al., who reported that 87.5% of falls occurred at home and 12.5% occurred outside(32).

Concerning time of falling, most incidents (75.4%) occurred during the morning, whereas 32.4% occurred at night. The same has been documented by Dhargave et al., who reported that 72.5% of falls occurred in the morning(32). This may be explained by the fact that most daily activities of the elderly people occur in the morning.

The highest rate of falling was observed among persons aged 76-85 years. However age was not a predictor for falls after controlling for confounders by multivariate logistic regression analysis. In Riyadh, falls progressively increased with advancing age(24). Also, in the Eastern Mediterranean Region, the incidence of falls was observed to increase steadily from middle-age onward, peaking in persons older than 80 years(30).

In the present study, falls did not differ according to gender. Similarly, several other studies, carried out in India(33) and the USA(34) reported no difference between elderly men and women regarding occurrence of falls. However, a Saudi study carried out in Riyadh revealed that falls were more significantly reported among elderly women(24). Also, several other studies found that females were more prone to falls compared to males (10, 32, 35-38).

In bivariate analysis, history of falls was more reported among illiterate, retired and widowed elderly people. However, after controlling for confounders by multivariate logistic regression analysis, only working status remained significant as retired people had more history of falls compared to non-working. This could be explained by the fact that the activity of retired people might be higher than that of non-working people, which may increase their susceptibility to falls.

In both bivariate and multivariate analysis in the current study, patients with visual sensory problems had more history of falls. The same has been observed by others(33, 39).

The present study showed that elderly people with a history of at least one chronic disease had more history of falls. Among studied individual chronic diseases, people with cardiac problems, stroke, imbalance disorder, vertigo, sensory visual problems had more history of falls. However, after controlling for confounders by multivariate logistic regression analysis, only those with cardiac diseases, vertigo and sensory visual problems had significantly more falls. In other studies carried out in Saudi Arabia(26) and Canada (40), the risk of falling was significantly higher in individuals with chronic conditions compared to those without. In a study carried out in India, elderly patients with chronic diseases, such as diabetes mellitus, hypertension, asthma, cardiovascular diseases, rheumatoid arthritis and cataract/refractive errors were at higher risk for falls(28). In another Indian study carried out in geriatric homes, poor vision, history of chronic diseases, use of walking aids, vertigo, and imbalance were significant risk factors for falls among elderly people(32). In a study carried out in Korea, visual and gait problems were responsible for most of falls among elderly(41). In Brazil, elderly patients with gait problems were more significantly like to have falls(26). In a meta-analysis that included 74 studies, the risk factors for falls were: previous history of falls, gait problems, using walking aids, vertigo, and Parkinson's disease(42).

Bivariate analysis in the present study revealed that elderly persons on medications had more falls compared to those without medications, particularly those on analgesics, anti-coagulants, thyroid drugs, drugs for asthma, Alzheimer. However, these effects disappeared after controlling for confounders in a multivariate logistic regression analysis. In a similar study carried out in India among residents of geriatric homes, use of multiple medications was significantly associated with falls(32). Also, in a recent study carried out in Riyadh, multiple drug use was a significant risk factor for falls(24). Mizukami et al. confirmed the association between polypharmacy and risk of falls among elderly individuals in Japan(29). Antiepileptic drugs use proved to be a risk factor for falls in a meta-analysis study(42). Using antidepressant medications was associated with increased risk of falls according to studies carried out by others(10, 33) .

The association between use of drugs and history of falls that was shown in bivariate analysis in the current study and was confirmed in other studies, could be attributed to the fact that elderly people may be more sensitive to drug effects and less efficient at metabolizing medications, leading to adverse events, which in turn lead to falls(43). In addition, using multiple drugs for chronic health problems can lead to dizziness, blackouts, and consequently

falls(44). Thus, falls may occur as a direct consequence of the patient's underlying impaired health status or it may be due to the side effects of some medications or the intake of multiple medications, or a combination of both of these factors.

Most falls are associated with the reduced functional capacity. The present study revealed that elderly persons who reported a history of going shopping had less history of falls compared to their counterparts, whereas those who needed a companion or a supporting aid to walk or used grab-bars at home had more history of falls compared to others. However, as a result of the cross-sectional design of the study, we could not establish if falls happened as a result of these behaviors or falls led to these behaviors. After controlling for confounders, only the need for a supporting aid to walk was shown to be a significant risk factor for falls. The finding of an association between reduced physical capacity and falls has been reported in several other studies(10, 34, 45-46).

Strengths and limitations of the study

The present study highlighted the existence of falls as a major problem among elderly patients attending PHC centers in Abha City and explored some important preventable risk factors. However the study has two important limitations. This study included only those who attended PHC centers, which could affect the generalizability of findings. Also, its cross-sectional design is another important limitation as it proves association, rather than causation, between the independent variables and falls.

Conclusion

Falls are a common health problem affecting most elderly people attending PHC centers in Abha City. Falls mostly occur indoors during the daytime. Falls among elderly people are associated with several characteristics, such as job status, medical factors, such as vertigo, sensory visual problems and cardiac diseases and behavioral factors, such as using a supporting aid to walk. Therefore, there is a need to raise awareness of the public through mass media messages regarding the high occurrence of falls among elderly people. Elderly people must receive more attention and special care than the rest of the community through organizing and implementing of an effective preventive program for falls. PHC physicians should screen all elderly people for the risk of falls as their prediction is an easy task.

References

1. UNFPA and HelpAge. Ageing in the twenty-first century: a celebration and a challenge. 2012 https://www.unfpa.org/public/home/ publications/ pid/11584
2. Almegbel FY, Alotaibi IM, Alhusain FA, et al. Period prevalence, risk factors and consequent injuries of falling among the Saudi elderly living in Riyadh, Saudi Arabia: a cross-sectional study. BMJ Open 2018;8:e019063.
3.Flimban MA, Abduljabar DF, Dhafar KO, Deiab BA, Gazzaz ZJ, Bansuan AU. Analysis of patient falls among hospitalised patients in Makkah region. JPMA 2016; 66: 994-998.
4.Asombang F, Tafor D. Prevention of falls in the elderly. Degree Thesis. Degree Program in Nursing 2015, Arcada.
5.Chen JJ. Functional Capacity Evaluation & Disability. Iowa Orthop J. 2007; 27: 121–127.
6. Berry CJ, Kessels RPC, Wester AJ, Shanks DR. A single-system model predicts recognition memory and repetition priming in amnesia. The Journal of Neuroscience, August 13, 2014 • 34(33):10963–10974 •
7.Tucker MG, Kavanagh JJ, Morrison S, Barrett RS. Differences in rapid initiation and termination of voluntary postural sway associated with ageing and falls-risk. J Mot Behav. 2010;42(5):277-87.
8.KallinK, Jensen J, Olsson LL, Nyberg L, Gustafson Y. Why the elderly fall in residential care facilities, and suggested remedies. J Fam Pract. 2004;53(1):41-52.
9. Salkeld G, Cameron I, RG Cumming ea. Quality of life related to fear of falling and hip fracture in older women: A time trade off Study. BMJ 2000;46:320: 241
10.Todd C, Skelton D. What are the main risk factors for falls among older people and what are the most effective interventions to prevent these falls? Health Evidence Network Report Copenhagen WHO Regional Office for Europe; 2005. Available from: http://www.euro.who.int/document/E82552.pdf. [Last accessed on 2019 Jun 03].
11.Kannus P, Parkkari J, Niemi S, Palvanen M. Fall-Induced Deaths Among Elderly People. Am J Public Health. 2005; 95(3): 422–424.
12.Kannus P, Khan KM. Prevention of falls and subsequent injuries in elderly people: a long way to go in both research and practice. CMAJ. 2001; 165(5): 587–588.
13.Yeong UY, Tan SY, Yap JF, Choo WY. Prevalence of falls among community-dwelling elderly and its associated factors: A cross-sectional study in Perak, Malaysia. Malays Fam Physician 2016; 11(1): 7–14.
14.Fang X, Shi J, Song X. et al. Frailty in relation to the risk of falls, fractures, and mortality in older Chinese adults: Results from the Beijing longitudinal study of aging. J Nutr Health Aging 2012; 16(10):903–7.
15.Kitayuguchi J, Kamada M, Okada S. et al. Association between musculoskeletal pain and trips or falls in rural Japanese community-dwelling older adults: A cross-sectional study. Geriatr Gerontol Int. 2014;15(1):54–64.
16.Chu L, Chi I, Chiu A. et al. Incidence and predictors of falls in the Chinese elderly. Ann Acad Med Singapore. 2005;34(1):60–72.
17.Kato M, Izumi K, Shirai S, Kondo K, Kanda M, Watanabe I, et al. Development of a fall prevention program for elderly Japanese people. Journal of nursing and Health sciences 2008; 10:281-290.
18.Clemson L, Cumming RG, Kendig H, Swann M, Heard R, Taylor K. The effectiveness of a community-based program for reducing the incidence of falls in the elderly: a randomized trial. J Am Geriatr Soc. 2004;52(9):1487-94.
19.WHO. World Health Organization. Falls. Key facts. 16 January 2018. Website: http://www.who.int/news-room/fact-sheets/detail/falls.
20.Fonad E, Wahlin TB, Winblad B, Emami A, Sandmark H. Falls and fall risk among nursing home residents. J Clin Nurs 2008; 17: 126-134.
21.Aseer Directorate of Health Affairs, 2018 (Personal Communication).

22.Swinscow TDV. Statistics at Square One. Ninth Edition. Revised by MJ Campbell, University of Southampton. Copyright BMJ Publishing Group 1997.
23. Chen JJ. Functional capacity evaluation & disability. Iowa Orthop J. 2007;27:121-7.
24. Alshammari SA, Alhassan AM, Aldawsari MA, Bazuhair FO, Alotaibi FK, Aldakhil AA, et al. Falls among elderly and its relation with their health problems and surrounding environmental factors in Riyadh. J Family Community Med. 2018;25(1):29-34.
25. Almawlawi E, Al Ansari A, Ahmed A. Prevalence and risk factors for falls among the elderly in primary healthcare centers (PHC) in Qatar. Qatar Med J. 2011;2011:7.
26. Brito TA, Coqueirorda S, Fernandes MH, de Jesus CS. Determinants of falls in community-dwelling elderly: Hierarchical analysis. Public Health Nurs. 2014;31:290-7.
27. Bergen G, Stevens MR, Burns ER. Falls and fall injuries among adults aged≥65 years-United States, 2014. MMWR Morb Mortal Wkly Rep. 2016;65:993–8.
28. Mane AB, Sanjana T, Patil PR, Sriniwas T. Prevalence and correlates of fear of falling among elderly population in urban area of Karnataka, India. J Midlife Health. 2014;5:150–5.
29. Mizukami S, Arima K, Abe Y, Kanagae M, Kusano Y, Niino N, et al. Falls are associated with stroke, arthritis and multiple medications among community-dwelling elderly persons in Japan. Tohoku J Exp Med. 2013;231:299–303.
30. Al-Faisal W. Geneva, Switzerland: World Health Organisation; Falls Prevention for Older Persons: Eastern Mediterranean Regional Review. 2006.
31. Al-Nozha MM, Al-Hazzaa HM, Arafah MR, Al-Khadra A, Al-Mazrou YY, Al-Maatouq MA, et al. Prevalence of physical activity and inactivity among Saudis aged 30-70 years. A population-based cross-sectional study. Saudi Med J. 2007;28:559–68.
32. Dhargave P, Sendhilkumar R. Prevalence of risk factors for falls among elderly people living in long-term care homes. Journal of Clinical Gerontology & Geriatrics 2016; 7:99-103
33. Patil SS, Suryanarayana SP, Dinesh R, Shivraj NS, Murthy NS. Risk factors for falls among elderly: A community-based study. Int J Health Allied Sci 2015;4:135-40.
34. Berg WP, Alessio HM, Mills EM, Tong C. Circumstances and consequences of falls in independent community welling older adults. Age Ageing 1997;26:261-8.
35. Gale CR, Cooper C, Sayer AA. Prevalence and risk factors for falls in older men and women: The English Longitudinal Study of Ageing. Age and Ageing 2016; 45: 789–794
36. Gillespie LD, Gillespie WJ, Robertson MC. Interventions for preventing falls in elderly people. Cochrane Database Syst Rev 2003;4:CD000340. Available from: http: www.ncbi.nlm.nih.gov/pubmed/. [Last accessed on 2019 Oct 25].
37. Chang VC, Do MT. Risk factors for falls among seniors: implications of gender. Am J Epidemiol 2015; 181: 521–31.
38. Gine-Garriga M, Roque-Figuls M, Coll-Planas L, Sitja-Rabert M, Salva A. Physical exercises interventions for improving performance-based measures of physical function in community-dwelling, frail older adults: a systematic review and meta-analysis. Arch Phys Med Rehabil 2014;95:753-69.
39. Suraj K, Awasthi GV. Relationship between fear of falling, balance impairment and functional mobility in community dwelling elderly. Ind J Phys Med Rehabil 2008; 9:48-52.
40. Sibley KM, Voth J, Munce SE, Straus SE, Jaglal SB. Chronic disease and falls in community-dwelling Canadians over 65 years old: A population-based study exploring associations with number and pattern of chronic conditions. BMC Geriatr. 2014;14:22.
41. Lim YM, Sung MH. Home environmental and health-related factors among home fallers and recurrent fallers in community dwelling older Korean women. Int J Nurs Pract. 2012;18:481-8.
42. Deandrea S, Lucenteforte E, Bravi F, Foschi R, La Vecchia C, Negri E. Risk factors for falls in community-dwelling older people: a systematic review and meta-analysis. Epidemiology 2010; 21:658-68.
43. Laurence ZR. Clinical risk assessment, interventions and services of falls in older people: Epidemiology, risk factors and strategies for prevention. Age Ageing 2006; Available from: http://www.ageing.oxfordjournals.org. [Last accessed on 2019 Mar 18].
44. Government of India. Old Age Solutions Portal on Technology Solutions for Elderly Falls and Accidents do not "Just Happen". Available from: http://www.science and society.dst.org.
45. Krishnaswamy B, Jnanasambandam U. Falls in Older People: National and Regional Review India. Available from: http://www.who.int/ageing/projects/SEARO.pdf.
46. Carlos A, Reyes OS, Kyriakos S. Falls among elderly persons in Latin America and the Caribbean and among elderly Mexican-Americans. Pan Am J Public Health 2005;17:5-6.

The Allergic Diseases Commonly Associated with Cow Milk Protein Sensitization: A Retrospective Study (Jeddah – Saudi Arabia)

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Abstract

Background: Cow milk allergy (CMA) is the clinical presentation of cow milk protein (CMP) sensitization. CMA is a prevalent morbidity worldwide especially in children.

Objective: To identify common allergic diseases associated with CMP sensitization.

Methods: This was a retrospective chart review conducted. Data from 83 patients were included in the study. Patients included in this study were those diagnosed with CMA at the allergy clinics of Laluna, a private medical center in Jeddah, Saudi Arabia. All in vitro tests of 83 CMA cases were performed retrospectively in 2018 utilizing a RIDA® system panel, which contains 30 common food sensitizers unique to Saudi Arabia. CMPs and other food sensitizations were determined based on the clinical allergic disease diagnoses taken from a local database in Laluna clinic.

Results: SIgE food allergy tests for 83 patients were evaluated. Gender distribution was 51 females (61.5%) and 32 males (38.5%). The most common CMP sensitizations, order were alpha lactalbumin, 59 (71%); casein, 48 (58%); milk, 38 (46%); beta lactoglobulin, 29 (35%); and assorted cheeses mix 13 (16%). Allergic diseases associated with CMP sensitization were atopic dermatitis, 40 (48%); allergic rhinosinusitis, 36 (43%); asthma, 26 (31%); allergic conjunctivitis, 12 (14%); urticaria and angioedema, 10 (12%). As for the most common associated food sensitizers, in the category of nuts, cashews and peanuts caused the most severe reaction. In the category of grains, wheat was also implicated in severe reactions, and egg in the protein category.

The severity of CMP sensitizations are as follows, in descending order: alpha lactalbumin (94.3); casein (58.54); milk (51.19); beta lactoglobulin (29.11) and assorted cheeses mix.

Conclusion: Alpha lactalbumin and casein, followed by milk are the most common sensitizers and also cause the most severe allergic reactions. Atopic dermatitis and allergic rhinosinusitis, followed by asthma are the most common clinical allergic diseases associated with CMP sensitization. Cashew, peanut, wheat and egg were the most common food sensitizers associated with CMP sensitization. It should be noted that the most severe food sensitizer of all associated with CMP sensitization is cashew.

Key words: allergic diseases,
Cow Milk Protein Sensitization

Introduction

Cow's milk (CM) is primarily composed of water (88%). The other components are carbohydrates (5%), fat (3%), proteins (3%), and trace minerals and vitamins. Proteins represent a small percentage of CM, but they are the chief allergenic component, and are implicated in triggering allergic reactions. Casein is the main cow milk protein (CMP) and represents 80% of all proteins. It is composed of similar proteins which can be divided by pH. Whey is the second most common CMP, and consists primarily of alpha-lactalbumin and beta-lactoglobulin, which can only be separated by heat. These are the main CMPs responsible for inducing clinical allergies caused by intake of cow's milk. Other trace protein enzymes have little to no role in the causation of allergic disease.

The prevalence of cow's milk allergy (CMA) is increasing worldwide, particularly in infants' first year of life. In developed countries, 3% of the population struggles with CMA. Many cases of CMA can improve over time with the complete avoidance of cow milk.

The specific immunoglobulin E (sIgEs) to CMPs are considered a significant prognostic tool for evaluation of improvement, so they should be measured regularly. It was found that the earlier the increase in sIgEs relative to CMPs occurs, the more likely the CMA disease will persist and the allergy morbidities will continue (1).

Adverse reactions to CMPs can be divided into immune and non-immune responses. Immediate reactions are type 1 hypersensitivity reactions, dependent on sIgE responses against CMPs, and identified as CMAs. Delayed reactions are non-immune, immunoglobulin G (IgG) mediated, and are called CM intolerance (CMI).

Both forms of reactions primarily manifest in infancy. Symptoms typically involve skin, gut and lungs. Diagnosis of sIgE immune reactions is made by history, followed by allergy testing to detect sIgEs against CMPs. In vivo skin prick test (SPT) and in vitro sIgE blood tests (RAST) are used to determine that. However, definitive diagnosis is made by complete elimination of CM and, the CM oral challenge (2).

Parental presence (or other primary caretaker) during the consultation is crucial for providing relevant history for accurate diagnosis. During CM elimination, the patient is monitored for symptomatic improvement. Improvement of symptoms is highly suggestive, and definitive diagnosis is then made by CM oral challenge and carefully observing for recurrence of the symptoms (3).

Feeding formulas used for the prevention of CMAs are different from those used for CMA treatment. CMA prevention should be prioritized in high risk infants with a positive family history of allergies in one or both of their parents. Mothers' milk is the first line of prevention followed by partially hydrolyzed formulas (pHFs). Treatment of established CMA cases begins by eliminating CM and other dairy products as dietary mainstays, and replacing them with alternatives, such as extensively hydrolyzed formulas (eHFs). However, in severe cases of CMA, amino acid formulas (AFs) may be used (4).

Methods

This study was a retrospective chart review conducted throughout the year 2018. Data from 83 patients were included in the study. Patients included in this study were those diagnosed with CMAs at the allergy clinics of Laluna, a private medical center in Jeddah, Saudi Arabia. Data collected included the in vitro sIgE results of common food allergy triggers. Additionally, the diagnoses of allergic diseases for each sIgE result were also extracted. Data were recorded in Microsoft Excel spreadsheets.

The food sIgEs list panel utilized in this study was the RIDA® system, composed of 30 single and separate allergens. These food allergens were chosen carefully to represent those most common in Saudi Arabia. Allergens in this panel are separate from each other, and not mixed, like in the (Unicap® system). Severity of sensitization for each allergen was scored from 1 to 6. A score of zero was considered a negative sensitization. Roughly, mild sensitization is scored 1 and 2, moderate is 3 and 4, while severe is 5 and 6. Food allergen families in the (RIDA® system) are CMPs, nuts, fruits, vegetables, egg, seafood, grains, meat and plants (like cacao and mustard).

CMPs included in the (RIDA® system) panel are milk, casein, lactalbumin, lactoglobulin and cheese mix. The RIDA® system is considered to be a practical and inexpensive way to diagnose CMAs. However it may sometimes give false positive or negative results. Therefore, clinical correlation is needed. It is worth noting that the most accurate sIgE system is (Unicap®) which has a reputation for being exact and precise. Accordingly, this system carries a greater financial burden for patients, especially those with no health insurance.

Results

SIgE food allergy tests for 83 patients were evaluated. Of these, 52 were adults (62.6%). There were also 31 pediatric patients (37.4%). Gender distribution was 51 females (61.5%), and 32 males (38.5%). Patients ranged in age from 1 month to 75 years (mean 27 years and median 30 years).

Allergic diseases associated with positive sensitization to CMPs are demonstrated in Table 1. By ranking, they are atopic dermatitis, 40 (48%); allergic rhinosinusitis, 36 (43%); asthma, 26 (31%); allergic conjunctivitis, 12 (14%); and urticaria and angioedema, 10 (12%). (Table 1).

Frequency of CMP sensitization differed from one type of protein to another. By ranking, the frequency of positive sensitization to CMPs are alpha lactalbumin, 59 (71%); Casein, 48 (58%); milk, 38 (46%); beta lactoglobulin, 29 (35%); and cheese mix, 13 (16%) (Table 2).

The sum of severity classes of CMP sensitization varied from one protein to another. The order of the sum of CMP severity classes appear in the following succession: alpha lactalbumin, (94.3); casein, (58.54); milk, (51.19); beta lactoglobulin, (29.11), and cheese mix, (17.8) (Table-3).

Results of positive sensitization to other allergenic foods associated with CMP sensitization were recorded opposite in (Table 4). Cashew, egg, wheat and peanut were the most commonly occurring sensitizations (Table 4).

Severity classes of food sensitizations other than CMPs differed from one to another. Cashew, egg white, wheat and egg yolk were the most severe sensitizers (Table 5).

Table 1: Clinical allergic diseases associated with CMP sensitization

	No. of positive results	Percentage/83 cases
Atopic dermatitis	40	48
Allergic rhinosinusitis	36	43
Asthma	26	31
Allergic conjunctivitis	12	14
Urticaria, Angioedema	10	12

Table 2: Frequency of positive sensitization to each CMP

	No. of positive sensitizations	Percentage/83 cases
Alpha lactalbumin	59	71
Casein	48	58
Milk	38	46
Beta lactoglobulin	29	35
Cheese mix	13	16

Table 3: The sum of severity classes to CMPs

	Sum of severity classes / 83 cases
Alpha lactalbumin	94.3
Casein	58.54
Milk	51.19
Beta lactoglobulin	29.11
Cheese mix	17.8

Table 4: Other food sensitizations associated with CMP sensitization

	Number of positive sensitizations /83 cases	%
Cashew nut	40	48
Egg white	37	44.5
Egg yolk	29	35
Wheat flour	29	35
Peanut	23	28
Carrot	23	28
Honey	21	25
Shrimp	18	22
Sesame seed	17	20
Orange	16	19
Kiwi	16	19
Banana	16	19
Pecan nut	15	18
Strawberry	14	17
Codfish	13	16
Mango	12	14
Soy bean	12	14
Walnut	12	14
Cocoa	12	14
Date	11	13
Onion	10	12
Mussel	9	11
Tomato	8	10

Table 5: Other severity classes of food sensitizations associated with CMP sensitization

	Sum of severity classes / total 83 cases
Cashew nut	97
Egg white	62.88
Wheat flour	51.61
Egg yolk	44.44
Honey	36.5
Peanut	31.45
Shrimp	29.2
Carrot	28
Pecan nut	24.5
Sesame seed	22
Codfish	19.6
Cocoa	18
Kiwi	17
Orange	14.9
Walnut	14.5
Banana	11.43
Mango	10.55
Date	10.5
Strawberry	10.38
Soy bean	8
Onion	7
Mussel	7
Tomato	5.5

Summary of Results

- AD and ARS were the most common allergic diseases associated with CMP sensitization, followed by asthma. Conversely, AC, urticaria and angioedema were rarely associated. This means that any patient complaining of AD, ARS or asthma should have allergy testing to exclude CMP sensitization.
- Alpha lactalbumin and casein were the most common causes of CMP sensitization, whereas milk and beta lactoglobulin CMPs were less so. Cheese was the least common cause of CMP sensitization.
- The most severe CMP classes were alpha lactalbumin, followed by casein and milk, whereas both beta lactoglobulin and cheese CMPs were the least severe.
- Other food sensitizations associated with CMP sensitization were cashew, egg (white, yolk), wheat, peanut, carrot and honey. The least commonly associated foods in this spectrum were shrimp, sesame, orange, kiwi, banana, pecan, strawberry, codfish, mango, soybean, walnut, cocoa, date, onion, mussel and tomato.
- The most severe food sensitization class was cashew, followed by egg white, wheat and egg yolk. However, the least severe food sensitizers were honey, peanut, shrimp, and carrot.

Discussion

The morbidity of AD is higher in children consuming CMPs than in those who do not. CMPs can be found not just in milk but in other dairy products such as yoghurt, cheese and butter. However, the most common sources of CMPs for children are chocolate, Nutella® hazelnut spread, Kinder® chocolate candy and ice cream. Total IgE and eosinophil counts are higher in children with AD who consume CM or other dairy products on a regular basis than in children who do not (5).

An unusual and surprising finding in this study was that ARS is the second most common allergic disease associated with CMP sensitization, after AD. This is unusual because it differs from previously reported findings. This raises the possibility of geographical variations between Saudi Arabia and, for example, the United Kingdom. New cases of ARS should be referred for sIgE measurements in vitro or in vivo, especially for children (6).

British Society of Allergy and Clinical Immunology (BSACI) guidelines show that the most common systems affected by CMA are the skin and gastrointestinal tract, while the respiratory system is less commonly affected. The cardiovascular system is rarely affected (7).

Asthma and wheezy chest in children are diseases that can be triggered by CMPs. Additionally, CMPs can induce poor control in asthmatic children. Identification of sIgEs to CMPs in children with poor asthmatic control is indicated. Moreover, allergy testing should be done at each clinic visit. Evidence has shown that serial in vitro CMP sIgE measurements for each visit are a viable way to track asthma improvement (8).

Worldwide, alpha lactalbumin and casein are the most common CMPs capable of inducing elevations of sIgE levels. Alpha lactalbumin is most prevalent in Southeast Asia, while casein prevails in the West. Beta lactoglobulin CMPs have almost the same prevalence as casein. sIgE levels are higher in children with atopic dermatitis, indicating that children with eczema should undergo in vivo or in vitro sIgE allergy testing for CMPs (9).

The cashew nut is a main cause of anaphylaxis, especially in children. A recent pediatric food challenge study on cashew sensitized children showed that most of them react to the lowest dose of cashew. A third of the children sampled reacted with anaphylaxis. Gastrointestinal and skin symptoms predominate. Parents of children with cashew allergies should remain alert, because the onset of a reaction can be sudden and serious (10).

The risk of introducing artificial milk early tends to be underestimated. This practice increases the possibility of CMAs in those who are at risk of developing future clinical allergies. For that reason, new mothers should prioritize breast feeding and avoid supplementary CM formulas. Similarly, hospital nurseries and new parents should avoid giving newborns artificial milk formulas (11).

In children, CMAs can present with gastrointestinal symptoms such as diarrhea and hematochezia which are unresponsive to treatment. In infants less than six months of age with gastrointestinal symptoms unresponsive to treatment, workup should include allergy testing. Pediatricians, family physicians, general practitioners and nurses should be very knowledgeable about this presentation of CMAs and act accordingly. (12).

Ruling out CMAs in infants as early as possible is crucial in avoiding future morbidities. Medical professionals should have an established protocol for any suspected cases of CMA that includes a detailed history from parents or primary caretakers, and in vitro or in vivo sIgE tests for CMPs. Very few cases require the CM oral challenge. While such a protocol will not rule out all CMA cases, it can adequately identify most of them. The cost of allergy testing, should not be allowed to become an obstacle because the lifelong morbidities of CMA diseases are more expensive (13).

Investigations for CMA diagnoses used in allergy clinics are in vitro (sIgE) levels or in vivo (SPT). SPT is more sensitive and specific. Nonetheless, results may sometimes be unreliable which is why it is advisable to use them as confirmatory tests for each other when one of them comes back negative. The most reliable methods for CMA diagnosis, considered the gold standard, are an oral open CMP challenge, and a detailed history from patients (14).

Although more research is needed, early evidence indicates that a milk patch test (MPT) may have a valid role in CMA diagnosis. A MPT can diagnose type IV hypersensitivity, but not an immediate type I hypersensitivity. However, some studies have found that MPT can diagnose early CMA before other tests can detect it (SPT, sIgEs and histamine release test). Nonetheless, the best way to diagnose CMA is still CM elimination for 1 month followed by observation after gradual CM re-introduction (15).

Infant breastfeeding (BF) is considered a treatment for CMA. For best results, feeding should be limited to BF only without any artificial formulas. Research has shown that BF alone induces a state of hyposensitization which raises the levels of protective cytokines like interleukin 10 (IL-10) and decreases the level of total IgE. Adding pharmacologic drugs and immunologic sublingual immunotherapy to BF creates an effective triad of CMA treatment (16).

Another treatment for CMA is immunotherapy. Immunotherapy employs subcutaneous injections, which have the side effect of sudden anaphylaxis. Sublingual shots have less severe reactions because they are initiated with a very low dose, and can be built up slowly and gradually. Results of immunotherapy to CMA are impressive, with a good level of improvement. However much the improvement, though, CMA patients should always carry auto injector adrenalin pens with them (17).

It is common for parents of children with CMAs to frequently ask when CM can be re-introduced. Patients' tolerance to CM must be measured to answer such a question. There is evidence that a continuous, gradual decrease in sIgE levels to CMPs on regular clinic visits can give an impression that the child has developed a good level of tolerance. However, the main test before re-introducing CM is the milk challenge (18).

The question of whether CMA morbidities can appear in infants of exclusively BF mothers is an interesting one. Seemingly, the only way that can happen is through the passage of CMPs into breast milk. Initial research shows that may happen in 0.5% of infants, but it remains a controversial issue. To confirm that, one would have to identify CMPs in breast milk, and perform allergy tests such as in vivo, in vitro and milk challenge tests. The ideal way to prove this theory is to do a CM elimination from mothers, then monitor the infants. Mothers should not take this step as a preventive measure (19).

Conlusion

Atopic dermatitis and allergic rhinosinusitis, followed by asthma are the most common clinical allergic diseases associated with CMP sensitization. Alpha lactalbumin and casein, followed by milk CMPs are the most common sensitizers and the most severe classes. Cashew, egg, wheat and peanut are the most common food sensitizers associated with CMP sensitization. The most severe class food sensitizer associated with CMP sensitization is cashew.

References

1 Høst A. Frequency of cow's milk allergy in childhood. Ann Allergy Asthma Immunol. 2002.
2-Høst A. Cow's milk protein allergy and intolerance in infancy. Some clinical, epidemiological and immunological aspects. Pediatr Allergy Immunol. 1994.
3- Luyt D et al. BSACI guideline for the diagnosis and management of cow's milk allergy. Clin Exp Allergy. 2014.
4 Kansu A, et al. Consensus statement on diagnosis, treatment and follow-up of cow's milk protein allergy among infants and children in Turkey. Turk J Pediatr. 2016.
5 Pourpak Z et al. The role of cow milk allergy in increasing the severity of atopic dermatitis. Immunol Invest. Feb 2004.
6 D. Luyt et al. BSACI guideline for the diagnosis and management of cow's milk allergy. Clinical & Experimental Allergy. 2014.
7 D. Luyt et al. BSACI guideline for the diagnosis and management of cow's milk allergy. Clinical & Experimental Allergy. 2014.
8 Murray MG, et al. Milk-induced wheezing in children with asthma. Allergol Immunopathol (Madr). Sep 2013.
9 Chen FM et al. Analysis of α-lactalbumin-, β-lactoglobulin-, and casein-specific IgE among children with atopic diseases in a tertiary medical center in Northern Taiwan. J Microbiol Immunol Infect. April 2014.
10 van der Valk JP et al. Multicentre Double-Blind Placebo-Controlled Food Challenge Study in Children Sensitised to Cashew Nut. PLoS One. March 2016.
11 Kelly E, et al. Formula supplementation remains a risk for cow's milk allergy in breast-fed infants. Pediatr Allergy Immunol. 2019.
12 Yang QH, et al. [Clinical features of cow's milk protein allergy in infants presenting mainly with gastrointestinal symptoms: an analysis of 280 cases]. Zhongguo Dang Dai Er Ke Za Zhi. 2019.
13 Martorell A, et al. Cow's milk protein allergy. A multi-centre study: clinical and epidemiological aspects. Allergol Immunopathol (Madr). Mar 2006.
14 Mehl A, et al. Skin prick test and specific serum IgE in the diagnostic evaluation of suspected cow's milk and hen's egg allergy in children: does one replace the other? Clin Exp Allergy. 2012.
15 Majamaa H, et al. Cow's milk allergy: diagnostic accuracy of skin prick and patch tests and specific IgE. Allergy. 1999.
16 Manti S, et al. Breastfeeding and IL-10 levels in children affected by cow's milk protein allergy: A restrospective study. Immunobiology. 2017.
17 Babaie D, et al. Cow's Milk Desensitization in Anaphylactic Patients: A New Personalized-dose Method. Iran J Allergy Asthma Immunol. 2017.
18 Shek LP, et al. Determination of food specific IgE levels over time can predict the development of tolerance in cow's milk and hen's egg allergy. J Allergy Clin Immunol. 2004.
19 Denis M, et al. [Cow's milk protein allergy through human milk]. Arch Pediatr. 2012.

Prevalence of migraine headache and its associated factors among male secondary school teachers

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Abstract

Background: Migraine constitutes a public health problem. It is more common among the productive workforce segment of the population.

Objective: To assess prevalence of migraine, its patterns and associated factors among male secondary school teachers.

Methods: This study was conducted in Abha City, Saudi Arabia, following a cross-sectional descriptive design. A total of 200 male secondary school teachers were included. A self-administered questionnaire was adopted and modified from a previous study and was used for data collection.

Results: The prevalence of migraine among male secondary school teachers was 42.5%. The main site for migraine was the occipital region (55.3%). Migraine was mainly pulsating/throbbing among 49.4% of participants. The main medication taken to relieve migraine was paracetamol (52.9%). About half of participants (54.1%) had moderately severe migraine. The main premonitory symptoms were aura (37.6%) and photophobia (34.1%). The main triggers for migraine were exhaustion (55.3%), strong perfumes (34.1%), and weight lifting. Prevalence of migraine was significantly associated with having children (p=0.024), smoking (p=0.018), having a teaching workload >20 hours/week (p=0.013) and sleeping <8 hours/day (p=0.017).

Conclusions: Prevalence of migraine headache among male secondary school teachers in Abha City is high, mainly felt as throbbing, at the occipital region. The main premonitory symptoms are aura and photophobia, while the main migraine triggers are exhaustion, exposure to strong perfumes, and weight lifting. Risk factors for migraine include smoking, having children, high teaching workload and inadequate sleep.

Key words: Migraine, Headache disorders, school teachers, Prevalence, Risk factors.

Introduction

Globally, migraine constitutes a common source of burden for public health and primary care (1). It was ranked as the third most prevalent disorder and seventh-highest specific cause of disability worldwide (2). It negatively affects both quality of life and productivity whether at work or at home. It is more common among the productive workforce segment of the population. If migraine is not appropriately managed, it becomes a progressive and chronic disorder (3).

During the last decades, death toll from infectious diseases has been either declining or stabilizing and there are greater numbers of people who live longer. Therefore, disorders that cause morbidity and disability have become important causes of global health burden (4) . The global years lived with disability for headache disorders have been steadily increasing since 1990. Therefore, primary headache disorders are now the leading causes of sequelae of about one third of the population (5).

The World Health Organization has recognized migraine as an important public health concern and listed it as one of the leading causes of disability worldwide (6). It is described as "a common, chronic neurovascular brain disorder that has cranial autonomic findings, characterized by recurrent, severe attacks of headaches often associated with other symptoms and much disability, as well as personal, familial and societal impact" (7).

According to the Third International Classification of Headache Disorders (ICHD-3 Beta), migraine has been classified into two major subtypes, i.e., migraine without aura (characterized by headache with specific features and associated symptoms) and migraine with aura, which is primarily characterized by the transient focal neurological symptoms that usually precede or sometimes accompany the headache. Episodic migraine is characterized by those with migraine who have 0 to 14 headache days per month, while chronic migraine is characterized by 15 or more headache days per month for 3 or more months (8).

In literature, limited evidence exists about epidemiology and risk factors for migraine (9). The prevalence slightly decreases with age. Moreover, subjects with less than a high-school education had a 3-fold greater risk compared with persons who attained a university-level education (10). Katsarava et al. (11) noted that, since there are no biological markers for migraine, its diagnosis is mainly based on clinical history and the exclusion of other headache disorders.

This study aimed to assess prevalence of migraine, its patterns and associated factors among male secondary school teachers in Abha City, Saudi Arabia, 2018.

Methods

Following a cross-sectional descriptive design, this study was conducted in Abha City, in the southwestern part of Saudi Arabia. The minimum sample size was calculated, using Raosoft Online program for sample size calculation (12) to be 159 teachers, based on 32% prevalence, (13) 95% confidence level, 5% error and 10% for non-respondents. A total of 200 male secondary school teachers were included in the present study.

Inclusion criteria were being a male school teacher who is appointed at a governmental secondary school in Abha City, Saudi Arabia for at least one year, while the exclusion criteria were being a female or a newly appointed teacher.

The field work for this study was conducted during the period from 15 December 2018 till 15 January 2019. The official list of schools was obtained from Aseer Directorate of Education. Following a simple random sample, the researcher selected 10 governmental secondary schools that fulfilled the required study sample size. All teachers within a selected school were invited to participate in the study.

A self-administered questionnaire was adopted and modified from a previous study (13) . It was validated by three family medicine consultants. The study questionnaire consists of two main parts:

- First part: socio-demographic and personal characteristics of participant teachers.
- Second part: consists of two domains:

Domain 1: Diagnostic criteria of episodic migraine headache: Unilateral, pulsating quality and moderate or severe intensity; aggra¬vated by physical activity and associated with nausea and/or vomiting, photophobia and phonophobia (14) .
Domain 2: factors associated with migraine headache: Migraine is preced¬ed by aura, a mostly visual reversible focal neurological symptom that has duration of no longer than one hour (14) .

A pilot study was conducted on 20 teachers to test the study tool and to assess the time needed to fill out the questionnaire. Modifications were made according to results of the pilot study. However, the data collected within the pilot study were not included in the main study.

All necessary official permissions were fulfilled before start of data collection. The Institutional Research Board approval was obtained from the Research Ethical Committee at King Khalid College of Medicine (REC # 2018-06-30). A written informed consent was obtained from each participant. All collected data were kept confidential and were not used except for research purposes.

Collected data were entered into a computer using the Statistical Package for Social Sciences (IBM SPSS, version 23). Descriptive statistics (i.e., frequency, percentage,

mean and standard deviation) were calculated. Chi-square test of significance was applied to compare migraineur with non-migraineur teachers. P-values less than 0.05 were considered as statistically significant.

Results

Personal characteristics of participant teachers are described in Table 1. Age of almost half of participants (49.5%) was 40-50 years. The majority were married (94.5%), while 4% were single and 1.5% were divorced. About two-thirds of participants (61.5%) had 1-4 children, while 12 had no children and 26.5% had 5 children or more. About one quarter of participants (23.5%) were smokers. Most participants (88.5%) had a Bachelor Degree, while 11.5% had postgraduate degrees. About one quarter of participants (25.5%) were obese, 41.5% were overweight and 33% had normal body mass index. Most participants (87%) earned >10000 SR monthly income, while 13% had less than 10000 SR income per month. More than half of participants (57%) had 10-20 years' experience in teaching, 11% had less than 10 years' experience, and 32% had more than 20 years' experience. Regarding the teachers' weekly workload, 84% had 10-20 hours, 10.5% had less than 10 hours and 5.5% had more than 20 hours. The average duration of sleep among 32% of participants was less than 8 hours/day.

Figure 1 shows that 82 participant male secondary school teachers (42.5%) had migraine.

Table 2 shows that the main site for migraine was the occipital region (55.3%) followed by the eyes (25.9%) and the temporal region (18.8%). Migraine pain was mainly pulsating/throbbing among 49.4% of participants, pressure pain among 22.4%, heavy pain among 10.6% or constriction pain among 8.2%, while other types were present among 9.4%. The main medications taken by participants to relieve their migraine were paracetamol (52.9%), anti-inflammatory drugs (29.4%) and triptans (3.5%). Without receiving medication, the duration of migraine was mainly more than 4 hours among 52.9% of participants, while it was mainly less than 2 hours among 62.4% of participants, when receiving medication. During their last month, 64.7% had 1-5 migraine attacks, while 21.2% had more than 5 attacks. About half of participants (54.1%) had moderately severe migraine, while 30.6% had mild migraine and 15.3% had severe migraine.

Table 3 shows that the main premonitory symptoms for migraine were aura (37.6%), photophobia (34.1%), nausea (28.2%), sonophobia (16.5%) and vomiting (9.4%). The main triggers for migraine were exhaustion (55.3%), strong perfumes (34.1%), and weight lifting.

Table 4 shows that prevalence of migraine among male secondary school teachers was significantly associated with number of their children, with the least prevalence among those having no children (p=0.024). Smokers had significantly higher prevalence of migraine than nonsmokers (57.4% and 37.9%, respectively, p=0.018). Teachers who had <10 hours/week teaching workload had the lowest prevalence of migraine (28.6%), while those who had >20 hours/week had the highest prevalence (81.8%). Difference in migraine prevalence among teachers differed significantly according to their teaching workload (p=0.013). Teachers with less than 8 hours' average duration of daily sleep had significantly higher prevalence of migraine than those whose average duration of daily sleep was 8 hours or more (54.7% and 36.8%, respectively, p=0.017). Teachers aged <40 years had the highest prevalence of migraine. However, difference in migraine prevalence among teachers did not differ significantly according to their age groups. Single teachers had the lowest prevalence of migraine, while divorced teachers had the highest prevalence. However, difference in migraine prevalence among teachers did not differ significantly according to their marital status. Teachers who had a postgraduate degree had higher prevalence of migraine than those who had a Bachelor Degree. However, difference in migraine prevalence among teachers did not differ significantly according to their qualification. Teachers with body mass index <25 kg/m2 had the lowest prevalence of migraine, while obese teachers had the highest prevalence. However, difference in migraine prevalence among teachers did not differ significantly according to their body mass index. Teachers who had <10000 SR monthly income had higher prevalence of migraine than those who had >10000 SR monthly income. However, difference in migraine prevalence among teachers did not differ significantly according to their monthly income. Teachers who had <10 years' experience in teaching had the highest prevalence of migraine. However, difference in migraine prevalence among teachers did not differ significantly according to their duration of experience in teaching.

Table 1: Personal characteristics of study sample

Personal characteristics	No.	%
Age groups		
• <40 years	84	42.0
• 40-50 years	99	49.5
• >50 years	17	8.5
Marital status		
• Single	8	4.0
• Married	189	94.5
• Divorced	3	1.5
No. of children		
• 0	24	12.0
• 1-4	123	61.5
• 5+	53	26.5
Smoking status		
• Smoker	47	23.5
• Non-smoker	153	76.5
Qualification		
• Bachelor Degree	177	88.5
• Postgraduate	23	11.5
Body mass index (BMI)		
• <25 kg/m²	66	33.0
• 25-29.9 kg/m²	83	41.5
• ≥30 kg/m²	51	25.5
Monthly income		
• <10000 SR	26	13.0
• ≥10000 SR	174	87.0
Years of experience in teaching		
• <10 years	22	11.0
• 10-20 years	114	57.0
• >20 years	64	32.0
Teaching workload		
• <10 hours/week	21	10.5
• 10-20 hours/week	168	84.0
• >20 hours/week	11	5.5
Average duration of daily sleep		
• < 8 hours	64	32.0
• ≥ 8 hours	136	68.0

Figure 1: Prevalence of migraine among male secondary school teachers

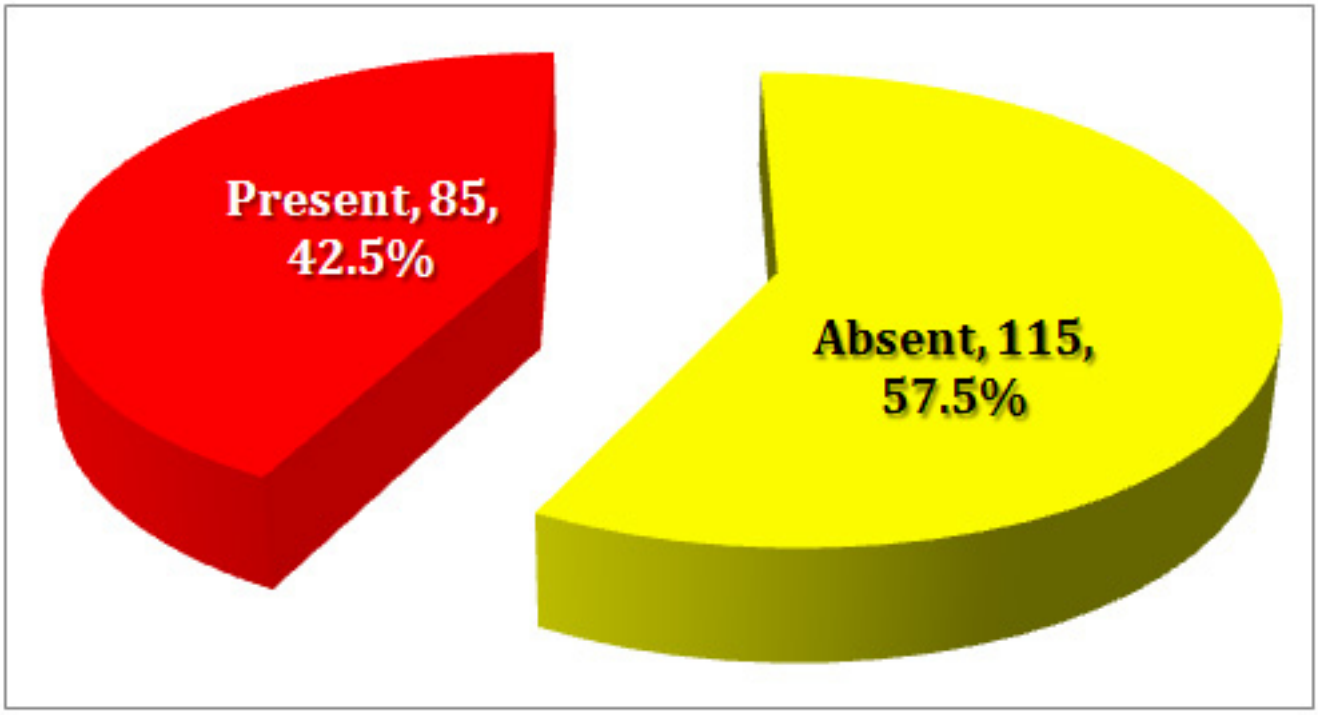

Table 2: Characteristics of participants' migraine headache (n=85)

Characteristics of migraine headache	No.	%
Site of migraine		
• Occipital region	47	55.3
• Eyes	22	25.9
• Temporal region	16	18.8
Type of migraine pain		
• Pulsating/throbbing	42	49.4
• Pressure pain	19	22.4
• Constriction pain	7	8.2
• Heavy	9	10.6
• Others	8	9.4
Medications taken to relieve migraine		
• Paracetamol	45	52.9
• Anti-inflammatory analgesics	25	29.4
• Triptans	3	3.5
• Others	12	14.1
Duration of migraine attacks without medication		
• <2 hours	17	20.0
• 2-4 hours	23	27.1
• >4 hours	45	52.9
Duration of migraine attacks after medication		
• <2 hours	53	62.4
• 2-4 hours	20	23.5
• >4 hours	12	14.1
No. of migraine attacks during last month		
• None	12	14.1
• 1-5	55	64.7
• >5	18	21.2
Severity of migraine		
• Mild	26	30.6
• Moderate	46	54.1
• Severe	13	15.3

Table 3: Main premonitory symptoms and triggers for migraine among male secondary school teachers (n=85)

Premonitory symptoms and triggers for migraine	No.	%
Premonitory symptoms		
• Aura	32	37.6
• Photophobia	29	34.1
• Nausea	24	28.2
• Sonophobia	14	16.5
• Vomiting	8	9.4
• Eyelid edema	7	8.2
• Ptosis	6	7.1
Triggers		
• Exhaustion	47	55.3
• Strong perfumes	29	34.1
• Weight lifting	18	21.2
• Others	11	12.9

Table 4: Prevalence of migraine among male secondary school teachers according to their personal characteristics

Personal characteristics	Present		Absent		P Value
	No.	%	No.	%	
Age groups					
• <40 years	37	44.0	47	56.0	
• 40-50 years	42	42.4	57	57.6	
• >50 years	6	35.3	11	64.7	0.801
Marital status					
• Single	2	25.0	6	75.0	
• Married	81	42.9	108	57.1	
• Divorced	2	66.7	1	33.3	0.421
No. of children					
• 0	4	16.7	20	83.3	
• 1-4	57	46.3	66	53.7	
• 5+	24	45.3	29	54.7	0.024
Smoking status					
• Smoker	27	57.4	20	42.6	
• Non-smoker	58	37.9	95	62.1	0.018
Qualification					
• Bachelor Degree	74	41.8	103	58.2	
• Postgraduate	11	47.8	12	52.2	0.583
Body mass index (BMI)					
• Normal (<25 kg/m²)	26	39.4	40	60.6	
• Overweight (25-29.9 kg/m²)	34	41.0	49	59.0	
• Obese (≥30 kg/m²)	25	49.0	26	51.0	0.541
Monthly income					
• <10000 SR	13	50.0	13	50.0	
• ≥10000 SR	72	41.4	102	58.6	0.407
Years of experience in teaching					
• <10 years	12	54.5	10	45.5	
• 10-20 years	44	38.6	70	61.4	
• >20 years	29	45.3	35	54.7	0.329
Teaching workload					
• <10 hours/week	6	28.6	15	71.4	
• 10-20 hours/week	70	41.7	98	58.3	
• >20 hours/week	9	81.8	2	18.2	0.013
Average duration of daily sleep					
• < 8 hours	35	54.7	29	45.3	
• ≥ 8 hours	50	36.8	86	63.2	0.017

Discussion

Worldwide, headache disorders constitute the most common neurological disorders, (5) with a considerable debilitating effect on occupational, physical and social activities (15) . They are ranked as the first cause of disability among those under the age of 50 years (16).

The present study revealed that prevalence of migraine among male secondary school teachers in Abha City was 42.5%. This finding reflects the high prevalence of migraine headache in Saudi Arabia in general, and possibly depicts its occupation-associated impact upon secondary school teachers.

Al-Jumah et al. (13) reported that prevalence of migraine among the population of Saudi Arabia was 32%. On the other hand, in USA, prevalence of migraine was reported to be about 12% (17).

Several studies documented the high prevalence rates for migraine among school teachers in some other countries. In Iran, Ayatollahi and Cheraghian (18) reported that its prevalence among teachers was 24%. Shahraki et al. (19) added that high school teachers were affected by migraine more than others. In France, Henry et al. (20) reported that teachers are most susceptible to migraine.

Farhadi et al. (21) mentioned several factors that may influence prevalence rates of migraine among different populations, including economic differences, climatic conditions, nutritional habits in addition to job conditions.

Regarding patterns of migraine among male secondary school teachers, our study showed that migraine headache was mainly throbbing in nature, and commonly felt in the occipital region. The main premonitory symptoms were aura, and photophobia, while the main triggers were exhaustion, exposure to strong perfumes, and weight lifting. Most migraine attacks were moderately severe. During their last month, the frequency of migraine attacks of the studied teachers was mostly 1-5. Paracetamol, anti-inflammatory drugs, and triptans were the main medications used to alleviate their migraine headache. Medications seemed to successfully manage migraine, since without treatment, the duration of migraine was usually more than 4 hours, while when with treatment it was less than two hours.

Our findings are in accordance with those reported by several studies. Etminan et al. (22) stated that about one quarter of migraine attacks occurs with aura. Migraine is usually unilateral, throbbing, accompanied by nausea, vomiting, photophobia, sonophobia, and is aggravated by movement and sensitivity toward strong scents (23) .

Antonaci et al. (24) stated that, nowadays the choice for treatment of acute migraine attacks has increased. Effective medications for management of migraine attacks are either non-specific drugs (e.g., analgesics and non-steroidal anti-inflammatory drugs) or specific drugs (e.g., ergot derivatives and triptans).

It has been shown that paracetamol alone is effective in the treatment of acute migraine attacks. Moreover, its low cost and wide availability makes it the first-choice drug for management of acute migraine, especially among those who cannot tolerate aspirin or non-steroidal anti-inflammatory drugs (25).

The present study identified that some risk factors are significantly associated with higher prevalence of migraine among male secondary school teachers. These included having children, being a smoker, having high teaching workload (>20 hours/week) and sleeping for <8 hours/day. However, prevalence of migraine among male secondary school teachers did not differ significantly according to their age groups (higher among younger than older teachers), marital status (higher among married and divorced than single teachers), qualification (higher among postgraduate qualified teachers), body mass index (higher among overweight and obese than normal weight teachers), monthly income (higher among less earning teachers) or years of experience in teaching (highest among those with least duration of experience).

These findings suggest a strong association between migraine and high stressors among school teachers.

Farhadi et al. (21) stated that occupational stress is one of the environmental risk factors for migraine. Maleki et al. (26) explained the high prevalence of migraine among certain occupations offers a unique model to understand the consequences of repeated stressors on the brain, which can alter the normal response of physiological systems. Consequently, the brain responds abnormally to environmental conditions.

Moreover, several studies documented the association between poor sleep and migraine (27) . Kachoui et al. (28) reported that inadequate sleep, tiredness and stress are the main factors associated with migraine

López-Mesonero et al. (29) found that the prevalence of active cigarette smoking is higher in migraineurs than in non-migraineurs. They concluded that smoking is a precipitating factor for migraine. This finding has been explained by an enhancing effect of smoking on the activity of brain monoamines, a decrease in nitric oxide production, or nicotine dependence.

Moreover, Junior et al. (30) reported that migraine was higher among married than single people, with no significant differences. Momayyezi et al. (31) explained this finding by the stress of marital life, e.g., high concerns toward economic problems, child rearing and frequent routine disputes between couples.

Also similar to our findings, Queiroz et al. (32) reported no significant relationship between educational status and migraine.

Conclusions

This study confirms the high prevalence of migraine headache among male secondary school teachers in Abha City, Saudi Arabia. It is mainly felt by migraineurs as throbbing, at the occipital region. Most migraine attacks are moderately severe. The main premonitory symptoms are aura and photophobia, while the main migraine triggers in our study are exhaustion, exposure to strong perfumes, and weight lifting. Migraine can be successfully controlled by paracetamol, anti-inflammatory drugs and triptans. Risk factors for migraine include smoking, having children, high teaching workload and inadequate sleep.

Therefore, School health programs should design and implement campaigns for prevention and management of migraine among teachers. Teachers are advised to avoid exhaustion, high teaching workload and triggers of migraine. Smokers should be strongly advised and supported to quit smoking. Paracetamol can be taken by migraineurs during their aura phase to reduce severity of migraine attacks.

References

1. Minen MT, Loder E, Tishler L, Silbersweig D. Migraine diagnosis and treatment: A knowledge and needs assessment among primary care providers. Cephalalgia. 2015;36(4):358–370.
2. Martelletti P, Birbeck GL, Katsarava Z, Jensen RH, Stovner LJ, Steiner TJ. The Global Burden of Disease survey 2010, Lifting The Burden and thinking outside-the-box on headache disorders. J Headache Pain 2013 14(1):13.
3. Woldeamanuel YW, Cowan RP. Migraine affects 1 in 10 people worldwide featuring recent rise: A systematic review and meta-analysis of community-based studies involving 6 million participants. J Neurol Sci. 2017;372:307–315.
4. Woldeamanuel YW, Andreou AP, Cowan RP. Prevalence of migraine headache and its weight on neurological burden in Africa: a 43-year systematic review and meta-analysis of community-based studies. J Neurol Sci. 2014; 342(1–2):1–15.
5. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, EzzatiM, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380(9859):2163–96.
6. WHO | The World Health Report 2001 - Mental Health: New Understanding, New Hope. WHO. 2013;
7. Mitsikostas DD, Rapoport AM. New players in the preventive treatment of migraine. BMC Med. 2015;13(1):279.
8. Olesen J. The International Classification of Headache Disorders, 3rd edition. Cephalagia. 2013;33(9):629–808.
9. Lipton RB, Bigal ME. Migraine: Epidemiology, Impact, and Risk Factors for Progression. Headache J Head Face Pain. 2005;45(s1):S3–13.
10. Scher AI, Stewart WF, Ricci JA, Lipton RB. Factors associated with the onset and remission of chronic daily headache in a population-based study. Pain. 2003;106(1–2):81–89.
11. Katsarava Z, Schneeweiss S, Kurth T, Kroener U, Fritsche G, Eikermann A, et al. Incidence and predictors for chronicity of headache in patients with episodic migraine. Neurology. 2004;62(5):788–90.
12. Raosoft Sample Size Calculator. Available from: http://www.raosoft.com/samplesize. html.
13. Al-Jumah M Al, Khathaami A Al, Kojan S, Hussein M, Stovner L, Steiner T, et al. The Burden of Primary Headache Disorders in Saudi Arabia (P03.112). Neurology. 2013;80(7 Supplement):P03.112-P03.112.
14. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders. Cephalalgia. 2004;24 (Suppl 1):9–160.
15. Korolainen MA, Kurki S, Lassenius MI, Toppila I, Costa-Scharplatz M, Purmonen T, Nissilä M. Burden of migraine in Finland: health care resource use, sick-leaves and comorbidities in occupational health care. The Journal of Headache and Pain 2019; 20:13.
16. Steiner TJ, Stovner LJ, Vos T, Jensen R, Katsarava Z. Migraine is first cause of disability in under 50s: will health politicians now take notice? J Headache Pain 2018; 19:17.
17. Lipton RB, Bigal ME, Diamond M, Freitag F, Reed ML, Stewart WF, et al. Migraine prevalence, disease burden, and the need for preventive therapy. Neurology. 2007; 68(5):343–9.
18. Ayatollahi SMT, Cheraghian B. Headaches among Primary Schools Teachers of Shiraz, 2003. JKMU 2005; 12(2):85-92.
19. Shahraki MR, Heydari Sadegh B, Moghtaderi A, Mirshekari H. The Study of Prevalence of Migraine among Teachers at Zahedan, Iran. Zahedan Journal of Research in Medical Sciences 2006; 8(2):137-142.
20. Henry P, Michel P, Brochet B, Dartigues JF, Tison S, Salamon R, et al. A nationwide survey of migraine in France: prevalence and clinical features in adults. Cephalalgia 1992; 12:229-37.
21. Farhadi Z, Alidoost S, Behzadifar M, Mohammadibakhsh R, Khodadadi N, Sepehrian R, et al. The Prevalence of Migraine in Iran: A Systematic Review and Meta-Analysis. Iran Red Crescent Med J. 2016; 18(10):e40061.
22. Etminan M, Takkouche B, Isorna FC, et al. Risk of ischaemic stroke in people with migraine: systematic review and meta-analysis of observational studies. BMJ. 2005; 330:63
23. Gordon N. Clinical Features of Migraine and Other Headache Disorders. Rhode Island Medical Journal 2015; February, 19-21.
24. Antonaci F, Ghiotto N, Wu S, Pucci E, Costa A. Recent advances in migraine therapy. SpringerPlus 2016; 5:637.
25. Derry S, Moore RA. Paracetamol (acetaminophen) with or without an antiemetic for acute migraine headaches in adults. Cochrane Database Syst Rev. 2013;(4): CD008040.
26. Maleki N, Becerra L, Borsook D. Migraine: maladaptive brain responses to stress. Headache. 2012;52 Suppl 2(Suppl 2):102–106.

27. Rains JC. Optimizing circadian cycles and behavioral insomnia treatment in migraine. Curr Pain Headache Rep 2008;12(3):213-219.
28. Kachoui H, Ameli J, Sharifi M, Tavalaei A, Keshavarzi N, Karami GR. Evaluation of provocating factors of migraine attacks. Kowsar Medical J. 2006;11(3):279–84.
29. López-Mesonero L, Márquez S, Parra P, Gámez-Leyva G, Muñoz P, Pascual J. Smoking as a precipitating factor for migraine: a survey in medical students. The Journal of Headache and Pain 2009; 10: 101–103.
30. Junior AS, Krymchantowski A, Moreira P, Vasconcelos L, Gomez R, Teixeira A. Prevalence of headache in the entire population of a small city in Brazil. Headache. 2009; 49(6):895-899.
31. Momayyezi M, Fallahzadeh H, Momayyezi M. Prevalence of Migraine and Tension-Type Headache in Yazd, Iran. Zahedan J Res Med Sci. 2015; 17(4):e966.
32. Queiroz LP, Barea LM, Blank N. An epidemiological study of head¬ache in Florianopolis, Brazil. Cephalalgia. 2006;26(2):122

Prevalence and Risk Factors of Musculoskeletal Pain among Governmental Male Secondary School Teachers

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Abstract

Objective: To explore prevalence and risk factors of musculoskeletal pain among male secondary school teachers.

Methodology: Following a cross-sectional study design, 400 male secondary school teachers in Abha City were included in this study. A self-administered study questionnaire was designed in a simple Arabic language by the researchers and was applied for data collection. It comprised personal and work-related characteristics in addition to the Örebro Musculoskeletal Pain Screening Questionnaire.

Results: About two-thirds of participants (62.5%) had musculoskeletal pain, mostly in multiple sites (38.5%). The most common sites for musculoskeletal pain were the low back (59.2%), the shoulder (47.9%) the limbs (43.3%) and the neck (41.3%). Duration of pain was mainly more than 3 months (43.3%). Risk factors for musculoskeletal pain included duration of sleep (p=0.020), obesity (p=0.027), and prolonged standing (p=0.016). Teachers' control over work differed significantly according to prevalence of musculoskeletal pain (p=0.004).

Conclusions: Prevalence of musculoskeletal pain among secondary school male teachers is high, mainly affecting the neck, shoulder, low back and the lower limbs. Experienced pain is significantly associated with low control over work. Risk factors for musculoskeletal pain include prolonged standing, obesity and duration of sleep.

Key words: Musculoskeletal pain, Teachers, Secondary School, Prevalence, Risk factors.

Introduction

Musculoskeletal disorders and the subsequent experienced musculoskeletal pain are common occupational health problems linked to inadequate workplace support and subsequently affect the quality of life of those affected (1).

Buckle and Devereux (2) stated that musculoskeletal disorders become work-related when work conditions and activities significantly contribute to their development. Greater prevalence rates of musculoskeletal disorders have been noted amongst school teachers (3).

The high prevalence rates of musculoskeletal disorders were linked to activities such as heavy lifting, awkward postures, bending, twisting or stooping, prolonged sitting or standing and repetitive motions that teachers often engage in while doing their jobs (3).

Teachers are among a group of workers exposed to occupational musculoskeletal disorders due to the inappropriate occupational characteristics they carry out (4). In China, Yue et al. (3) reported high prevalence rates (44% to 75%) for low back pain, 43% to 48% for neck pain and 29% to 56% for shoulder pain.

In Jeddah, Saudi Arabia, Abalkhail et al. (5) reported a prevalence of 26.2% of low back pain among school workers and predicted that the high magnitude of this condition could be as prominent as in industrialized countries.

Musculoskeletal pain is one of the leading causes for ill health retirement among school teachers (6). School teachers in general, have been demonstrated relative to other occupational groups, to report high rates of musculoskeletal disorders of between 40% and 95% (7).

The work of a teacher involves not only teaching students, but also preparing lessons, assessing students' work and extracurricular activities, such as sports. Teachers also participate in different school committees. These may cause teachers to suffer adverse mental and physical health issues due to the variety of job functions and their unique and wide variety of job functions (8).

Chaiklieng and Suggaravetsiri (9) pointed out that among teachers, prolonged posture, static work and repetition are the cause of repetitive strain injuries, which are one type of musculoskeletal disorder that directly causes pain to the areas of upper limbs, neck, shoulder and low back.

The impact of musculoskeletal disorders within the teaching profession has not been given sufficient attention in the literature. Studies on the prevalence and risk factors of musculoskeletal disorders among teachers are quite scarce (10-12).

Aim of Study

To explore prevalence and risk factors of musculoskeletal disorders among secondary school teachers in Abha City.

Subjects and Methods

Following a cross-sectional research design, the present study included 400 male governmental secondary school teachers in Abha City. Any teacher with obvious somatic disability was excluded.

A study questionnaire was designed by the researchers and was adapted from the studies of Darwish and Al-Zuhair (13) and Sjolie (14). It included personal characteristics, e.g., basic anthropometric measures, special habits and work place risk factors. Severity of musculoskeletal pain was assessed based on the Örebro Musculoskeletal Pain Screening Questionnaire (15).

A pilot study was carried out, on a purposive sample of 20 male secondary school teachers from schools which were not included in the main study. The pilot study aimed at testing the feasibility of the study and clarity of questions. However, these data were not included in the main data of the study.

A multistage stratified random sample was applied to select schools and teachers at governmental secondary schools in Abha City according to a list of secondary schools and teachers provided by Aseer Directorate of Education. The total number of study schools was selected so as to fulfill the required sample size of teachers.

The Institutional Research Board approval was obtained from the Research Ethical Committee at King Khalid College of Medicine. Participation in the present study was based on written informed consent that was signed by each participant. All collected data were kept completely confidential and were used only for research purposes.

The Statistical Package for Social Sciences (IBM SPSS, version 23) was used for data collection and analysis. Descriptive statistics of data was applied (Mean+SD for quantitative data as well as frequencies and percentages for qualitative data). The chi square ($X2$) test of significance was applied to compare observed differences. P-values less than 0.05 were considered as statistically significant.

Results

Table 1 shows that 49.5% of participants were aged 40-50 years, while 42.2% were aged less than 40 years and 8.3% above 50 years (Mean±SD: 41.2±6.7 years). The majority were married (94.5%) while 4.2% were single and 1.3% were divorced. About two-thirds of participants (62%) had 1-4 children, while 12.2 had no children and 25.8% had 5 children or more (Mean±SD: 3.3±2.2). Most participants (88.5%) had a Bachelor Degree, while 11.5% had postgraduate degrees. About one quarter of participants (22.7%) were smokers. About one quarter of participants (25.8%) were obese, 43% were overweight and 31.3% had normal body mass index. About half of the participants (52.6%) had 7-8 hours sleep per day, 43% had less than 7 hours daily sleep while 4.4% had more than 8 hours daily sleep (Mean±SD: 7.0±4.3 hours/day). Most participants (85.4%) had 10000 SR monthly income or more, while 14.6% had less than 10000 SR income per month.

Table 2 shows that more than half of participants (58.1%) had 10-20 years' experience in teaching, 10.7% had less than 10 years' experience, and 31.1% had more than 20 years' experience, (Mean±SD: 17.0±7.0 years). Regarding weekly workload, 87% had 10-20 hours, 8.9% had less than 10 hours and 4.2% had more than 20 hours. During work, 31.3% always undergo prolonged standing, 56% sometimes have prolonged standing and 12.8% never have prolonged standing. During work, 47.4% always have prolonged sitting, 50.3% sometimes have prolonged sitting, and 2.3% rarely do that. About two-thirds of participants (64.6%) claimed to have low control over work, 29.9% have intermediate control, and only 5.5% have high control.

Table 3 shows that 62.5% of teachers have musculoskeletal pain (Figure 1), mostly in multiple sites (38.5%), as shown in Figure 2. The most common sites for musculoskeletal pain were the low back (59.2%), followed by the shoulder (47.9%) the lower limbs (43.3%) and the neck (41.3%), as shown in Figure 3. The duration of pain was mainly more than 3 months (43.3%). Out of a maximum severity score of 10, participant mean severity score was 5.43+2.22. The risk for work disability was present among 46.3% of participants.

Table 4 shows that participants whose average duration of sleep is 7-8 hours/day had the least prevalence of musculoskeletal pain (55.9%). Those who sleep more than 8 hours/day had the highest prevalence (70.6%), followed by those who sleep less than 7 hours/day (69.7%). Differences in prevalence of musculoskeletal pain among participants differed significantly according to their duration of daily sleep (p=0.020). Moreover, obese teachers had the highest prevalence of musculoskeletal pain (72.7%). Differences in prevalence of musculoskeletal pain according to teachers' body mass index were statistically significant (p=0.027). However, differences in prevalence of musculoskeletal pain among participants did not differ significantly according to their age group, marital status, number of their children, smoking status, qualification, years of experience, or monthly income.

Table 5 shows that the highest prevalence of musculoskeletal pain was among participants who have more than 20 hours/week (87.5%), while the least was among those whose workload is less than 10 hours/week. However, differences in prevalence of musculoskeletal pain did not differ significantly according to participants' workload. Regarding prolonged standing of teachers during their work, the highest prevalence of musculoskeletal pain was among participants who always stand during their work (68.3%), while the least was among those who rarely stand during work (44.9%). Differences in prevalence of musculoskeletal pain differed significantly according to participants' prolonged standing during work (p=0.016). Regarding prolonged sitting during work, the highest prevalence of musculoskeletal pain was among those who rarely have prolonged sitting during work (77.8%). However, differences in prevalence of musculoskeletal pain did not differ significantly according to having prolonged sitting during work. Differences in control over work differed significantly according to prevalence of musculoskeletal pain, with least prevalence being associated with highest control over work and highest prevalence being associated with lowest control over work, while high (47.6% and 68.5%, respectively, p=0.004).

Table 1: Sociodemographic characteristics of study sample

Personal characteristics	No.	(%)
Age (in years)		
• <40	162	(42.2)
• 40-50	190	49.5)
• >50	32	(8.3)
• Mean±SD	41.2±6.7	
Marital status		
• Single	16	(4.2)
• Married	363	(94.5)
• Divorced	5	(1.3)
No. of children		
• None	47	(12.2)
• 1-4	238	(62.0)
• 5+	99	(25.8)
• Mean±SD	3.3±2.2	
Qualification		
• Bachelor Degree	340	(88.5)
• Postgraduate	44	(11.5)
Smoking status		
• Smoker	87	(22.7)
• Non-smoker	297	(77.3)
Body mass index (BMI)		
• <25 kg/m²	120	(31.3)
• 25-29.9 kg/m²	165	(43.0)
• ≥30 kg/m²	99	(25.8)
Average sleeping hours (hours/day)		
• <7	165	(43.0)
• 7-8	202	(52.6)
• >8	17	(4.4)
• Mean±SD	7.0±4.3	
Monthly income		
• <10000 SR	56	(14.6)
• 10000+ SR	328	(85.4)

Table 2: Participants' work-related characteristics

Work-related characteristics	No.	(%)
Years of experience in teaching		
• <10 years	41	(10.7)
• 10-20 years	223	(58.1)
• >20 years	120	(31.3)
• Mean±SD	17.0±7.0	
Work load		
• <10 hours/week	34	(8.9)
• 10-20 hours/week	334	(87.0)
• >20 hours/week	16	(4.2)
Prolonged standing during work		
• Always	120	(31.3)
• Sometimes	215	(56.0)
• Rare	49	(12.8)
Prolonged sitting during work		
• Always	182	(47.4)
• Sometimes	193	(50.3)
• Rare	9	(2.3)
Control over work		
• Low	248	(64.6)
• Intermediate	115	(29.9)
• High	21	(5.5)

Table 3: Participants' musculoskeletal pain characteristics

Pain characteristics	No.	%
Musculoskeletal pain		
• Absent	144	(37.5)
• Present	240	(62.5)
- No. of pain sites		
• One site	92	(24.0
• Multiple sites	148	(38.5)
Pain site (n=240)		
• Neck	99	(41.3)
• Shoulder	115	(47.9)
• Elbow	28	(11.7)
• Wrist	21	(8.8)
• Low back	142	(59.2)
• Lower limb	104	(43.3)
Duration of pain (n=240)		
• <1 month	70	(29.2)
• 1-3 months	66	(27.5)
• >3 months	104	(43.3)
Severity score of musculoskeletal pain (Mean±SD)	5.43±2.22	
Risk for work disability (n=240)		
• Absent	129	(53.8)
• Present	111	(46.3)

Table 4: Participants musculoskeletal pain according to their personal characteristics

Personal characteristics	Present		Absent		P Value
	No.	%	No.	%	
Age groups					
• <40 years	108	66.7	54	33.3	
• 40-50 years	116	61.1	74	38.9	
• >50 years	16	50.0	16	50.0	0.173
Marital status					
• Single	10	62.5	6	37.5	
• Married	226	62.3	137	37.7	
• Divorced	4	80.0	1	20.0	0.718
No. of children					
• None	31	66.0	16	34.0	
• 1-4	154	64.7	84	35.3	
• 5+	55	55.6	44	44.4	0.250
Smoking status					
• Smoker	57	65.5	30	34.5	
• Non-smoker	183	61.6	114	38.4	0.509
Qualification					
• Bachelor Degree	210	61.8	130	38.2	
• Postgraduate	30	68.2	14	31.8	0.408
Body mass index (BMI)					
• <25 kg/m²	69	57.5	50	52.5	
• 25-29.9 kg/m²	98	59.4	67	40.6	
• >30 kg/m²	72	72.7	27	27.3	0.027
Average sleeping hours					
• <7 hours/day	115	69.7	50	30.3	
• 7-8 hours/day	113	55.9	89	44.1	
• >8 hours/day	12	70.6	5	29.4	0.020
Monthly income					
• <10000 SR	32	57.1	24	42.9	
• 10000+ SR	208	63.4	120	36.6	0.370

Table 5:

Work characteristics	Present		Absent		P Value
	No.	%	No.	%	
Years of experience in teaching					
• <10 years	22	53.7	19	46.3	
• 10-20 years	149	66.8	74	33.2	
• >20 years	69	57.5	51	42.5	0.110
Teaching workload					
• <10 hours/week	20	58.8	14	41.2	
• 10-20 hours/week	202	61.7	128	38.3	
• >20 hours/week	14	87.5	2	12.5	0.103
Prolonged standing during work					
• Always	82	68.3	38	31.7	
• Sometimes	136	63.3	79	36.7	
• Rare	22	44.9	27	55.1	0.016
Prolonged sitting during work					
• Always	113	62.1	69	37.9	
• Sometimes	120	62.2	73	37.8	
• Rare	7	77.8	2	22.2	0.632
Control over work					
• Low	170	68.5	78	31.5	
• Intermediate	60	52.2	55	47.8	
• High	10	47.6	11	52.4	0.004

Discussion

Musculoskeletal pain among teachers is mostly work-related and mainly due to an exhausted body (16) . Although prevalence of musculoskeletal pain among teachers is relatively high, (13; 17-18), studies on its prevalence and risk factors are scarce (12) . Therefore, the present study aimed to explore prevalence and risk factors of musculoskeletal pain among secondary school teachers.

The present study revealed that the self-reported prevalence of musculoskeletal pain among secondary school teachers was as high as 62.5%, mostly in multiple sites. The low back was the most common site (59.2%), followed by the shoulder (47.9%) the lower limb (43.3%) and the neck (41.3%).

This finding is in accordance with those reported by several studies. In five different regions in Saudi Arabia, Alsiddiky et al. (1) reported a high prevalence of musculoskeletal pain particularly low back pain (66.9%), neck pain (58.2%) and shoulder pain (60.6%). In Dammam, Saudi Arabia, Darwish and Al-Zuhair (13) reported the overall prevalence of musculoskeletal pain disorders among secondary school Saudi females was 79.71% and the most common site for pain was the back, followed by shoulder pain, and neck pain (63.8%, 42.1% and 54.4%, respectively), while the prevalence of lower limb pain was 40%. Pain duration among participants was mainly more than six months (56.3%). In Al-Jouf Region, Saudi Arabia Abdel-Salam et al. (19) reported that prevalence of musculoskeletal pain among secondary school female teachers was 68.5%, mostly in multiple sites. The main sites of pain were the low back (68.4%), knees (58.6%), shoulder (47.7%), and the neck (45.4%).

In Botswana, Erick and Smith (20) reported that prevalence of musculoskeletal disorders among school teachers was 83.3%. The most commonly affected sites were the upper neck (52.6%), shoulder (52.5%), feet (33.8%) and wrists (30.7%).

In Brazil, Cardoso et al. (4) reported that the overall prevalence of musculoskeletal pain related to any of the three body segments was 55%. In Ethiopia, Temesgen et al. (21) reported that the prevalence of musculoskeletal pain among school teachers was 57.3%. They emphasized that teachers who have musculoskeletal pain usually suffer a low quality of life, functional impairments and work disability.

Results of almost all studies indicate that musculoskeletal pain among teachers constitutes a common and important occupational health problem. Therefore, preventive control measures should be urgently applied in order to minimize associated work disability. Moreover, the study of teachers' sitting and standing postures and their training to follow healthy postures can help avoid musculoskeletal pain.

The present study showed that musculoskeletal pain among participant teachers was mainly chronic, of more than 3 months' duration, with an average severity score of 5.43±2.22 (i.e., moderate severity). The risk for work

disability was present among 46.3% of participant teachers with musculoskeletal pain. The highest prevalence of pain among teachers was associated with their lowest control over their work and vice versa.

These findings are consistent with those of Ebied (22), who reported that pain severity among almost half of school teachers was mainly moderate (49.5%), while it was severe among 47%. The duration of musculoskeletal pain was more than 6 months among 76% of teachers. Darwish and Al-Zuhair (13) in Dammam, Saudi Arabia, reported that the pain duration was more than 6 months among 56.3% of teachers, while the study of Abdel-Salam in Al-Jouf, Saudi Arabia, reported that musculoskeletal pain was disabling among 35.6% of teachers. (19)

Regarding the risk factors for musculoskeletal pain among teachers, the present study showed that sleep for 7-8 hours/day was associated with the least prevalence of musculoskeletal pain (p=0.020). In addition, significantly higher prevalence of musculoskeletal pain was present among obese teachers (p=0.027). Moreover, higher prevalence of musculoskeletal pain was significantly associated with prolonged standing during work. However, it did not differ significantly according to other work-related characteristics.

These findings are mostly consistent with those reported by other studies. Darwish and Al-Zuhair (13) in Saudi Arabia, reported significant associations between musculoskeletal pain and increasing years of teaching and teachers' body mass index.

In Cairo, Egypt, Ebied (22) reported a significant association between musculoskeletal pain among teachers and both obesity and prolonged standing. The association of musculoskeletal pain with obesity has been also reported by Peltonen et al. (23), while length of employment in teaching was reported to be associated with musculoskeletal pain by both Chiu et al. (24) in China and Cardoso et al. (4) in Brazil.

Skoffer (25) suggested that, to prevent musculoskeletal pain among teachers, appropriately designed, ergonomically equipped infrastructure should be fulfilled inside classrooms to facilitate modern methods of teaching. Thus, prolonged standing and uncomfortable postures for several hours during teaching can be avoided.

Erick and Smith (20) reported that, as a result of musculoskeletal pain, some teachers could not carry out normal activities, sought medical advice, changed their duties and became unable to work for several days. In Dammam, Saudi Arabia, Darwish and Al-Zuhair (13) reported that within an academic year, 5.4% of teachers with musculoskeletal pain reported 6-10 days of absenteeism.

Erick and Smith (20) concluded that musculoskeletal pain is significantly associated with teachers' work disability. It negatively affects their wellbeing and the whole teaching profession. Therefore, in order to decrease its high prevalence and negative impact on teachers and teaching, teacher's working conditions should be improved in addition to enforcing ergonomics education of teachers. In addition, it is important to optimize working daily hours for teachers, to plan ergonomic classes for teachers on how to avoid musculoskeletal pain (13).

Study limitations

The assessment of musculoskeletal pain in this study was mainly subjective, through self-reported information provided by a self-administered questionnaire. Moreover, the generalizability of findings of the present study should be considered cautiously since it included only male teachers at governmental secondary schools for boys in Abha City.

Conclusions

Prevalence of musculoskeletal pain among secondary school male teachers is quite high, mainly with moderate severity, and more than three months' duration. It is most commonly affecting the neck, shoulder, low back and the lower limbs. The risk for work disability is present among almost half of teachers with musculoskeletal pain. Experienced pain is significantly associated with low control over work. Risk factors for musculoskeletal pain include prolonged standing, obesity and duration of sleep.

Therefore, measures to minimize the high prevalence of musculoskeletal pain among teachers need to be implemented by the school health program to avoid its harmful impact on teachers' personal and work productivity. Further studies are needed to explore prevalence and risk factors for musculoskeletal pain among both male and female teachers at all educational school levels in Abha and other cities in the Kingdom of Saudi Arabia. Clinical examination to identify musculoskeletal disorders among teachers, rather than self-reporting, will add further accuracy to research results related to prevalence of musculoskeletal pain among teachers.

References

1- Alsiddiky A, Algethami H, Elaf A, Tohtah H, J. The prevalence of musculoskeletal pain and its associated factors among female Saudi school teachers. Pakistan Journal of Medical Sciences, 2014; 30(6): 1191-1196.
2- Buckle PW, Devereux JJ. The nature of work-related neck and upper limb musculoskeletal disorders. Applied Ergonomics, 2003; 33(3):207-217.
3- Yue P, Liu F, Li L. Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors. BMC Public Health, 2012; 12:789.
4- Cardoso JP, De Queiroz Batista Ribeiro I, Maria de Araújo T, Carvalho FM, José Farias Borges dos Reis E. Prevalence of musculoskeletal pain among teachers. Rev Bras Epidemiol 2009; 12: 1–10.
5- Abalkhail BA, Bahnassy AA, Ghabrah TM. Low back pain among Saudi school workers in Jeddah. Saudi Medical Journal, 1998; 19 (4): 491-95.

6- Maguire M, O'Connell T. Ill-health retirement of schoolteachers in the Republic of Ireland. Occup Med 2007; 57(3):191–93.
7- Erick PN, Smith DR. Musculoskeletal disorders in the teaching profession: an emerging workplace hazard with significant repercussions for developing countries. Industrial Health, 2015; 53(4): 385-386.
8- Chong EY, Chan AH. Subjective health complaints of teachers from primary and secondary schools in Hong Kong. Int J Occup Saf Ergon 2010; 16:23–39.
9- Chaiklieng S, Suggaravetsiri P. Risk factors for repetitive strain injuries among school teachers in Thailand. Work: A Journal of Prevention, Assessment and Rehabilitation 2012; 41: 2510-2515.
10- Abdul Samad NI, Abdullah H, Moin S, Tamrin SBM, Hashim Z. Prevalence of low back pain and its risk factors among primary school teachers. American Journal of Applied Sciences, 2010; 7(5): 634-639.
11- Korkmaz NC, Cavlak U, Telci EA. Musculoskeletal pain, associated risk factors and coping strategies in school teachers. Scientific Research and Essays, 2011; 6(3): 649-657.
12- Parker R, Jelsma J. The prevalence and functional impact of musculoskeletal conditions amongst clients of a primary health care facility in an under-resourced area of Cape Town. BMC Musculoskeletal Disorders, 2010; 11: 2.
13- Darwish M A, Al-Zuhair SZ. Musculoskeletal Pain Disorders among Secondary School Saudi Female Teachers. Pain research and treatment, 2013.
14- Sjolie AN. Active or passive journeys and low back pain in adolescents. Eur Spine J 2003; 12:581– 588.
15- Linton SJ, Halldén K (1998) Can we screen for problematic back pain? A screening questionnaire for predicting outcome in acute and subacute back pain. Clin J Pain 14:209–215.
16- Abdulmonem, A., Hanan, A., Elaf, A., Haneen, T. and Jenan, A. 2014. The prevalence of musculoskeletal pain and its associated factors among female Saudi school teachers. Pakistan Journal of Medical Sciences, 30(6): 1191-1196.
17- Erick PN, Smith DR. A systematic review of musculoskeletal disorders among school teachers. BMC Musculoskeletal Disorders, 2011; 12(1): 260.
18- Durmus D, Ilhanli I. Are there work-related musculoskeletal problems among teachers in Samsun, Turkey? Journal of Back and Musculoskeletal Rehabilitation, 2012; 25(1): 5-12.
19- Abdel-Salam DM, Almuhaisen AS, Alsubiti RA, Aldhuwayhi NF, Almotairi FS, Alzayed SM, Bakri FF. Musculoskeletal pain and its correlates among secondary school female teachers in Aljouf region, Saudi Arabia. Journal of Public Health: From Theory to Practice 2019. Website: https://doi.org/10.1007/s10389-019-01127-8. Last accessed: October 1st, 2019.
20- Erick PN, Smith DR. The prevalence and risk factors for musculoskeletal disorders among school teachers in Botswana. Occup Med Health Aff 2014; 2: 4.
21- Temesgen MH, Belay GJ, Gelaw AY, Janakiraman B, Animut Y. Burden of shoulder and/neck pain among school teachers in Ethiopia. BMC Musculoskeletal Disorders 2019; 20:18.
22- Ebied EME. Work-Related Musculoskeletal Pain among Primary School Teachers: A Recommended Health Promotion Intervention for Prevention and Management. World Journal of Nursing Sciences 2015; 1 (3): 54-61.
23- Peltonen M, Lindroos AK, Torgerson JS. Musculoskeletal pain in the obese: a comparison with a general population and long-term changes after conventional and surgical obesity treatment. Pain 2003; 104(3): 549–557.
24- Chiu TT, Lam PK. The prevalence of and risk factors for neck pain and upper limb pain among secondary school teachers in Hong Kong. J Occup Rehabil 2007; 17(1):19-32.
25- Skoffer B. Low Back Pain in 15 to 16-year old children in relation to school furniture and carrying of the school bag. Spine (Philadelphia, USA) 2007; 32(24): 713-717.

Prevalence and risk factors for overweight and obesity among primary care physicians

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Abstract

Background: Primary health care (PHC) physicians play a major role in delivering weight management programs through their close contact with patients and the public. However, obese physicians may have negative attitudes toward obesity management.

Aim of Study: To assess prevalence of obesity among PHC physicians and to explore their attitudes and practices regarding obesity management.

Subjects and Methods: A cross-sectional study design was followed at PHC centers in Abha City. It included 120 PHC physicians. A data collection sheet was developed. It comprised participants' sociodemographic characteristics, their attitude and practices toward obesity management and their body mass index (BMI).

Results: Most participants (83.3%) had a positive attitude toward obesity management and 79.2% provide counseling for obese patients. About one-third of PHC physicians (32.5%) were overweight, and 25% were obese. Overweight and obesity were significantly more prevalent among male than female physicians (p=0.026). PHC physicians' attitude toward obesity management differed significantly according to their classes of body mass index (p=0.014). Counseling of obese patients differed significantly according to their classes of body mass index (p=0.035).

Conclusions: Prevalence of overweight and obesity among PHC physicians in Abha City is quite high, especially among male physicians. Physicians' attitude toward management of obesity is mainly positive. Positive attitude and provision of counseling regarding obesity management are less common among overweight and obese PHC physicians.

Recommendations: Urgent actions are required to motivate PHC physicians, especially males, to achieve a healthy normal body weight. They should be encouraged to provide counseling on obesity management.

Key words: Body mass index, Primary Health Care, Overweight, Obesity, Attitude, Counselling

Introduction

Obesity is a major public health issue in developed countries and is emerging as a cause for concern in developing countries (1-2). Obesity has become a global epidemic over the last few decades (3). The prevalence rates for childhood and adolescence obesity have increased by more than 75% (4).

The main contributing factor is the obesogenic environment where increased urbanization fatty foods become increasingly accessible and physical activity decreases. Cardiovascular disease–related deaths in developing countries is 46.7% when compared with 26.5% in developed countries as a result of lifestyle changes related to urbanization and industrialization (5).

Approximately 2.5 million deaths globally are attributable to obesity, of which one third occurs in developing countries (6). It has been estimated that 2% to 7% of the total health care costs in developed countries are due to obesity (7).

It has been realized that health professionals worldwide are vulnerable to overweight and obesity. It has been reported that 8% of Canadian physicians were obese (8). Moreover, a survey of 11 European national colleges of general practitioners revealed that 31.76% were overweight and 7.13% were obese (9). Zhu and Norman (10) stated that the UK Department of Health found that of the 1.2 million staff in the National Health Service, 300,000 would be classified obese and a further 400,000 as overweight.

Zhu and Norman (10) stated that health professionals with healthy habits are more committed to promoting related healthy behaviors than those with unhealthy habits. Therefore, a central question has been considered regarding whether overweight doctors are less likely than those who are not overweight to practice weight management counseling with their patients and the public.

Often known as the “Battle of the Bulge”, obesity has assumed epidemic properties in the Arab countries. The numbers are especially bad in the Gulf countries, because of the rapid pace of social and economic changes over the last few decades. Obesity rates of 25-30% and even higher are typical in Bahrain, Kuwait and the United Arab of Emirates (UAE). High levels of obesity exist particularly among women in many Arab countries including Saudi Arabia (11-12).

In the Kingdom of Saudi Arabia, Al-Hazzaa (13) and Al-Almaie (14) stated that obesity has increased in the last three decades, and become a major health problem.

Zhu and Norman (10) noted that health professionals are well placed and expected to play a major role in implementing these health policies and delivering weight management programs through their close contact with patients and the public.

That health professionals’ own health and health habits may influence their attitudes toward relevant professional behaviors has been demonstrated by many studies. Health professionals who smoke have less favorable attitudes toward smoking cessation (15-18), less confidence in their efficacy to help the patients to quit smoking (5) and less intention to counsel their patients (19), and are less likely to perceive themselves as role models for their patients or the general population, when compared with non-smoking health professionals (16; 20).

Similar findings have been reported with respect to obesity and physical activity with unfit health professionals being less likely to hold positive attitudes towards promoting physical activity than physically fit health professionals (21-23). Therefore, it seems possible that overweight or obese health professionals will hold less positive attitudes towards weight management than their non-overweight counterparts (24).

Aim of study

To assess prevalence of obesity among primary care physicians in Abha City and to explore their attitudes and practices regarding obesity management.

Subjects and Methods

Following a cross-sectional design, the study was conducted at PHC centers in Abha City, Aseer Region at the southwestern part of Saudi Arabia. The study population included all PHC physicians in Abha City, Aseer Region in the southwestern part of Saudi Arabia (N=135). A total of 120 PHC physicians participated in this study (i.e., response rate of 88.9%). A data collection sheet was developed by the researchers, based on thorough review of relevant literature. It comprised participants’ sociodemographic characteristics, their attitude and practices toward obesity management and their body mass index (BMI).

Participants’ data on their weight and height were measured and their body mass index (BMI) was calculated (weight in kg)/(height in m2) and participants’ BMI was classified into either normal (<25 kg/m2), overweight (25-29.9 kg/m2) or obese (>30 kg/m2) (25).

A five-point Likert-type scale (i.e., 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree) was used to determine attitudes toward obesity treatment. Scores for each participant’s responses were added up. Therefore, the total score ranged from 20 to 100. Participants’ who obtained total attitude scores <50 were considered as having a “negative” attitude, while those who obtained total attitude scores >50 were considered to have a “positive” attitude.

Before start of data collection, it was clearly emphasized to each PHC physician that he/she is completely free to accept or to refuse to participate in this study. They were all advised to keep their identity anonymous, as collected data are for research purposes only. This study was carried out at the full expense of the researchers.

Collected data were verified prior to computerized data entry. The Statistical Package for Social Sciences (SPSS ver 22.0) was used for data entry and analysis. Descriptive statistics were calculated, (e.g., frequency and percentage). Testing hypothesis was carried out by the application of the chi square ($X2$) test. A significant level was considered when a p-value is less than 0.05.

Results

Table 1 shows that the age of about half of participant PHC physicians (50.8%) was 30-40 years, 43.3% were <30 years old and only 5.8% were >40 years old. More than half of participants (53.3%) were males, while 77.5% were married. Most participants (81.7%) were Saudi, residents (80%), while 10% had Diploma/MSc or Doctorate/Fellowship (10.8%). Most participants (80%) were residents, 11.7% were specialists and 8.3 were consultants. About two-thirds of participants (61.7%) had <5 years' experience in PHC, while 28.3% had 5-10 years' experience and 10% had >10 years' experience. More than half of participants (54.2%) did not attend any CME activity on obesity management.

Table 2 shows that the majority of participants (83.3%) had a positive attitude toward obesity management (Figure 1). About one third of participants (36.7%) see 10-20 obese patients weekly, 18.3% see 20-30 obese patients weekly, while 45% see less than 10 obese patients weekly. Most participants (79.2%) provide counseling for obese patients (Figure 2).

Figure 3 shows that about one third of PHC physicians (32.5%) were overweight, 25% were obese, while the BMI of 42.5% was normal.

Table 3 shows that overweight and obesity were significantly more prevalent among male than female PHC physicians (37.5% vs. 26.8% and 31.3% vs. 17.9%, respectively, p=0.026). However, BMI classes did not differ among participant PHC physicians according to their age groups, marital status, nationality, qualification, position, duration of experience in PHC, or attending CME activity on obesity management.

Table 4 shows that prevalence of positive attitude among PHC physicians toward obesity management was highest among those with normal body mass index (94.1%), while the highest prevalence of negative attitude was highest among obese PHC physicians (30%). PHC physicians' attitude toward obesity management differed significantly according to their classes of body mass index (p=0.014). Moreover, counseling of obese patients by PHC physicians regarding obesity management was highest among those with normal body mass index (90.2%). Counseling of obese patients differed significantly according to their classes of body mass index (p=0.035). However, BMI classes did not differ significantly among participant PHC physicians according to the number of obese patients seen weekly.

Figure 1: Attitude of PHC physicians toward obesity management

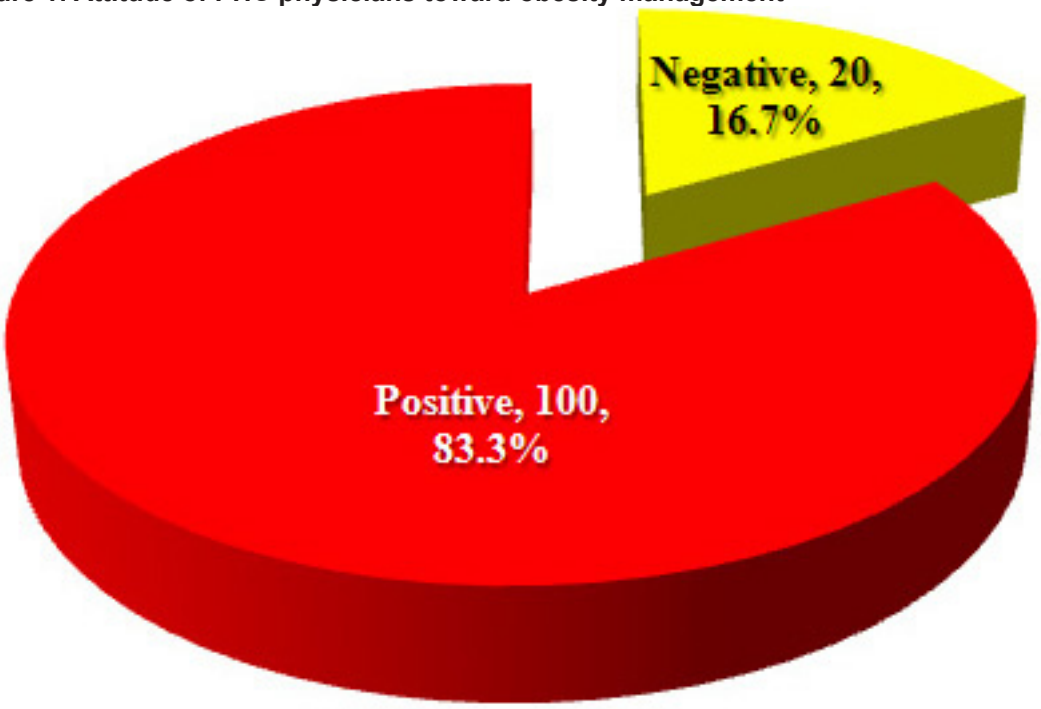


Table 1: Personal characteristics of primary health care physicians in Abha City

Personal characteristics	No.	%
Age groups		
• <30 years	52	43.3
• 30-40 years	61	50.8
• >40 years	7	5.8
Gender		
• Male	64	53.3
• Female	56	46.7
Marital status		
• Single	27	22.5
• Married	93	77.5
Nationality		
• Saudi	98	81.7
• Non-Saudi	22	18.3
Qualification		
• MBBS	95	79.2
• Diploma/MSc	12	10.0
• Doctorate/Fellowship	13	10.8
Position		
• Resident	96	80.0
• Specialist	14	11.7
• Consultant	10	8.3
Years of experience in PHC		
• <5 years	74	61.7
• 5-10 years	34	28.3
• >10 years	12	10.0
Attending CME activity on obesity management		
• Yes	55	45.8
• No	65	54.2

Table 2: Participants' attitude and practices regarding obesity management

Attitude and Practice	No.	%
Attitude toward obesity management		
• Negative	20	16.7
• Positive	100	83.3
No. of obese patients seen		
• <10/week	54	45.0
• 10-20/week	44	36.7
• 20-30/week	22	18.3
Counseling for obese patients		
• Yes	95	79.2
• No	25	20.8

Table 3: Participant primary care physicians' body mass index classes according to their personal characteristics

Personal characteristics	Normal		Overweight		Obese		P Value
	No.	%	No.	%	No.	%	
Age groups							
• <30 years	27	51.9	17	32.7	8	15.4	
• 30-40 years	23	37.7	19	31.1	19	31.1	
• >40 years	1	14.3	3	42.9	3	42.9	0.126
Gender							
• Male	20	31.3	24	37.5	20	31.3	
• Female	31	55.4	15	26.8	10	17.9	0.026
Marital status							
• Single	14	51.9	11	40.7	2	7.4	
• Married	37	39.8	28	30.1	28	30.1	0.056
Nationality							
• Saudi	39	39.8	33	33.7	26	26.5	
• Non-Saudi	12	54.5	6	27.3	4	18.2	0.439
Qualification							
• MBBS	42	44.2	29	30.5	24	25.3	
• Diploma/MSc	5	41.7	3	25.0	4	33.3	
• Doctorate/Fellowship	4	30.8	7	53.8	2	15.4	0.516
Position							
• Resident	42	43.8	31	32.3	23	24.0	
• Specialist	6	42.9	3	21.4	5	35.7	
• Consultant	3	30.0	5	50.0	2	20.0	0.632
Years of experience in PHC							
• <5 years	34	45.9	26	35.1	14	18.9	
• 5-10 years	14	41.2	8	23.5	12	35.3	
• >10 years	3	25.0	5	41.7	4	33.3	0.261
Attending CME activity on obesity management							
• Yes	28	50.9	16	29.1	11	20.0	
• No	23	35.4	23	35.4	19	29.2	0.216

Table 4: Primary care physicians' attitude and practice regarding obesity management according to their body mass index classes

Attitude and Practice	Normal		Overweight		Obese		P Value
	No.	%	No.	%	No.	%	
Attitude toward obesity management							
• Negative	3	5.9	8	20.5	9	30.0	
• Positive	48	94.1	31	79.5	21	70.0	0.014
No. of obese patients seen							
• <10/week	17	33.3	19	48.7	18	60.0	
• 10-20/week	20	39.2	16	41.0	8	26.7	
• 20-30/week	14	27.5	4	10.3	4	13.3	0.079
Counseling obese patients							
• Yes	46	90.2	27	69.2	22	73.3	
• No	5	9.8	12	30.8	8	26.7	0.035

Figure 2: Provision of counseling on obesity management by PHC physicians

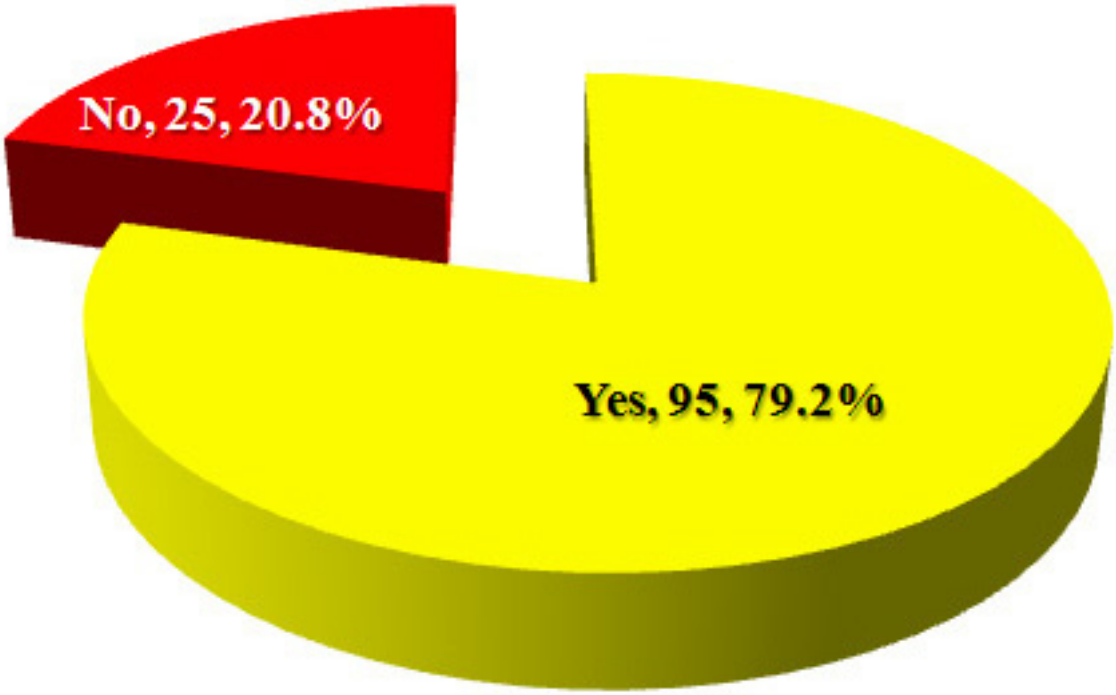
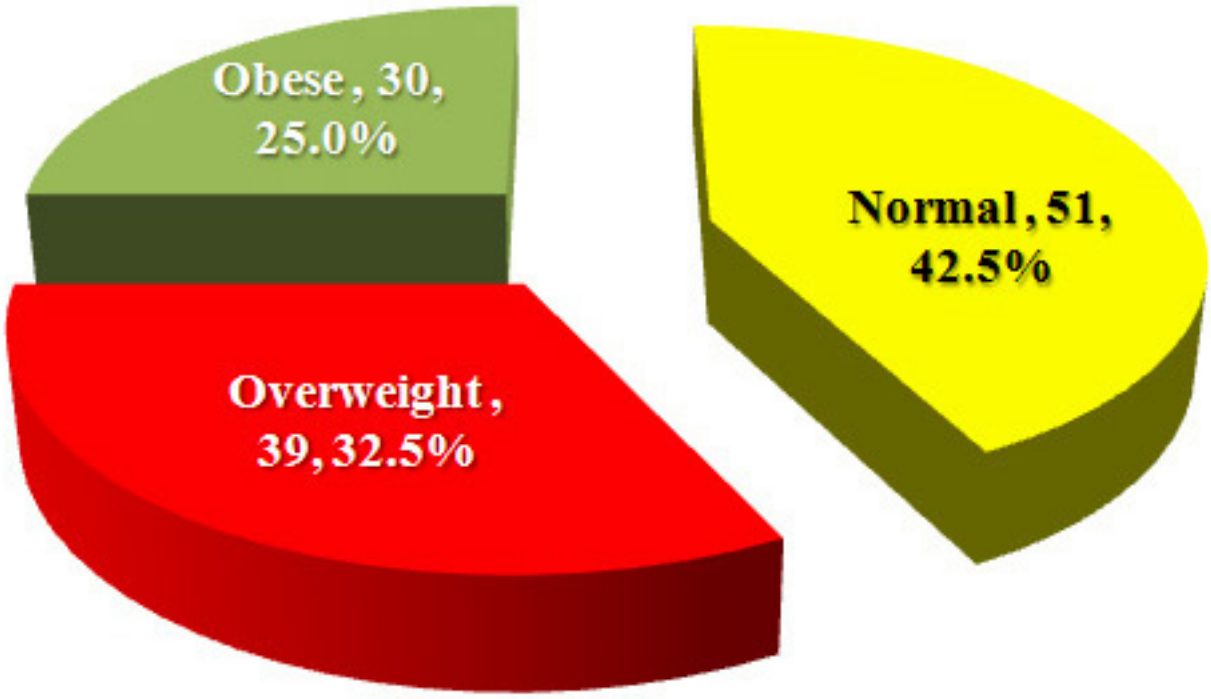


Figure 3: Distribution of body mass index of PHC physicians



Discussion

Results of the present study showed that about one-third of PHC physicians in Abha City, Aseer Region, Saudi Arabia, were overweight, while one quarter were obese.

This is in agreement with data reported by several studies. In Saudi Arabia, in Aseer Region, Saudi Arabia, Al-Zahrani et al. (26) found that overweight and obesity were present among 36% and 23.2% of the Saudi Board residents, respectively. In Bahrain, Al-Ghawi and Uauy (27) reported that 44% of PHC physicians were overweight, while 16% were obese. In the USA, 40% of physicians were overweight while 23% were obese (28).

It is to be noted that, in our study, the observed high prevalence of overweight and obesity among PHC physicians is in accordance with those reported by several studies among the adult general population in Saudi Arabia. In the community-based study of Al-Nozha et al. (25), it was found that 38.3% were overweight, while 29.9% were obese in the southern region of Saudi Arabia. In Al-Kharj City, Al-Ghamdi et al. (29) reported that 54.3% were either overweight or obese.

These findings indicate that physicians are not immune to being overweight or obese, and those prevalence rates among physicians in Saudi Arabia closely reflect those among the general population.

Overweight and obesity among PHC physicians in the present study were significantly more prevalent among male than female participants. However, physicians' BMI classes did not differ significantly according to their age groups, marital status, nationality, qualification, position, attending CME activity on obesity management, or experience in PHC.

These findings are in harmony with those of Al-Zahrani et al. (26) in KSA, who found that obesity was significantly higher among male than female resident physicians (31.9% vs. 7.1%, respectively, $p<0.001$). However, body mass index of participants did not differ significantly according to their age groups, nationality, or marital status. Similarly, Al-Ghawi and Uauy (27), in Bahrain, reported that overweight and obesity were more prevalent among male than female PHC physicians (60.9% vs. 38.1% and 26.1% vs. 12.7%, respectively).

The repeated observation reported by several studies regarding better body mass index among female physicians has been explained by Al-Zahrani et al. (26), who stated that the lower rate of obesity among female Saudi residents could be attributed to social factors, which usually motivate females to be more watchful toward their body weight than males. Furthermore, Warner et al. (31) noted that, being a female is an independent positive predictor of weight management practices.

Results of this study revealed that the majority of PHC physicians (83.3%) had a positive attitude toward obesity management. Moreover, physicians with normal body mass index had significantly more positive attitude toward obesity management and tended to provide significantly more counseling to obese patients than those with overweight or obesity.

These findings are in accordance with those of Foster et al. (30), who reported that physicians with BMI <25 kg/m2 were significantly more likely to feel obligated to provide counseling to obese patients on risks of obesity than those with BMI >25 kg/m2. Similarly, Warner et al. (31) indicated that normal weight physicians were 12 times more likely to believe that they were a role model for patients than physicians who were overweight or obese. Moreover, Bleich et al. (32) noted that physicians with normal BMI were more likely to be significantly more engaged with obese patients in weight-loss counselling than overweight or obese physicians.

Several studies have documented that obese physicians are less motivated toward their patients' obesity management, have less confidence that counseling will have an effect on their obese patients' behavior, and are more convinced that obesity management is mainly the responsibility of their patients (33-34). Moreover, the systematic review of Zhu et al. (24) concluded that overweight/obese health professionals hold less positive attitude toward weight management than their non-overweight counterparts.

Therefore, physicians' own health habits may influence their attitudes toward relevant professional behaviors. Unfit physicians are usually less likely to have positive attitudes toward promoting physical activity (8). Physicians' increased body weight, may constitute a critical barrier against obesity management, given the important role physicians can play in helping patients manage or lose weight (32).

Study limitations

Data in the present study were drawn only from PHC physicians in Abha City. This may limit the generalizability of its results.

Conclusions

In conclusion, prevalence of overweight and obesity among PHC physicians in Abha City is quite high. Most PHC physicians do not attend CME activities on obesity management, despite most of them seeing more than 10 obese patients weekly. Physicians' attitude toward management of obesity is mainly positive, although about one fifth do not provide counseling to their obese patients. Therefore, it is recommended that CME activities on obesity management should be organized and provided to PHC physicians. The Ministry of Health should design professional websites to provide up-to-date information on obesity management for physicians. Moreover, urgent action is required to support healthcare professionals to achieve and maintain a healthy weight.

References

1- Kelishadi R. Childhood overweight, obesity, and the metabolic syndrome in developing countries. Epidemiol Rev. 2007;29:62-76.
2- Zaini A. Global concerns fast requiring local action! Asia Pac J Public Health. 2007;19:1-2.
3- Baur LA. Child and adolescents obesity in the 21st century: an Australian perspective, Asia Pac J Clin Nutr 2002; 11(suppl 3):S524– S528
4- Ackard DM, Neumark-Sztainer D, Story M, Perry C. Overeating among adolescents: prevalence and associations with weight-related characteristics and psychological health, Pediatrics 2003; 111:67–74.
5- Simkhada P, Poobalan A, Simkhada PP, Amalraj R, Aucott L. Knowledge, Attitude, and Prevalence of Overweight and Obesity Among Civil servants in Nepal. Asia Pac J Public Health 2011; 23: 507-17.
6- Boutayeb AB. The burden of non-communicable diseases in developing countries. Int J Equity Health. 2005;4:2.
7- Hossain P, Kawar B, El Nahas M. Obesity and diabetes in the developing world—a growing challenge. New Engl J Med. 2007;356:213-215.
8- Frank E, Segura C. Health practices of Canadian physicians Can Fam Physician 2009; 55: 810–811.e7.
9- Brotons C, Bjorkelund C, Bulc M, Ciurana R, Godycki-Cwirko M, Jurgova E, et al. Prevention and health promotion in clinical practice: the views of general practitioners in Europe. Prev Med 2005; 40: 595–601.
10- Zhu DQ, Norman IJ, While AE. The relationship between doctors' and nurses' own weight status and their weight management practices: a systematic review. Obesity reviews (2011) 12: 459–469.
11- Al-Isa AN. Are Kuwaitis getting fatter? Nutr Health. 2003;17(3):185-97.
12- Al-Isa AN. Factors associated with overweight and obesity among Kuwaiti kindergarten female teachers. Nutr Health. 2004;18(1):67-71.
13- Al-Hazzaa HM. Prevalence of physical inactivity in Saudi Arabia: a brief review. East Mediterr Health J 2004;10(4-5):663-70.
14- Al-Almaie SM. Prevalence of obesity and overweight among Saudi adolescents in Eastern Saudi Arabia. Saudi Med J 2005;26(4):607-11.
15- Behbehani NN, Hamadeh RR, Macklai NS. Knowledge of and attitudes towards tobacco control among smoking and nonsmoking physicians in 2 Gulf Arab states. Saudi Med J 2004; 25: 585–591.
16- Parna K, Rahu K, Rahu M. Smoking habits and attitudes towards smoking among Estonian physicians. Public Health 2005; 119: 390–399.
17- Yan J, Xiao S, Ouyang D, Jiang D, He C, Yi S. Smoking behavior, knowledge, attitudes and practice among health care providers in Changsha city, China. Nicotine Tob Res 2008; 10: 737–744.
18- Aboyans V, Pinet P, Lacroix P, Laskar M. Knowledge and management of smoking-cessation strategies among cardiologists in France: a nationwide survey. Arch Cardiovasc Dis 2009; 102: 193–199.
19- McKenna H, Slater P, McCance T, Bunting B, Spiers A, McElwee G. Qualified nurses' smoking prevalence: their reasons for smoking and desire to quit. J Adv Nurs 2001; 35: 769–775.
20- Perrin PC, Merrill RM, Lindsay GB. Patterns of smoking behavior among physicians in Yerevan, Armenia. BMC Public Health 2006; 6: 139.
21- Frank E, Bhat Schelbert K, Elon L. Exercise counseling and personal exercise habits of US women physicians. J Am Med Womens Assoc 2003; 58: 178–184.
22- Rogers LQ, Gutin B, Humphries MC, Lemmon CR,Waller JL, Baranowski T, Saunders R. Evaluation of internal medicine residents as exercise role models and associations with self-reported counseling behavior, confidence, and perceived success. Teach Learn Med 2006; 18: 215–221.
23- Al-Doghether M, Al-Tuwijri A, Khan A. Obstacles to preventive intervention. Do physicians' health habits and mind-set towards preventive care play any role? Saudi Med J 2007; 28: 1269–1274.
24- Zhu D, Norman IJ, While AE. The relationship between health professionals' weight status and attitudes towards weight management: a systematic review. Obesity reviews 2011; 12: e324–e337.
25- Al-Nozha MM, Al-Mazrou YY, Al-Maatouq MA, Arafah MR, Khalil MZ, Khan NB, et al. Obesity in Saudi Arabia. Saudi Med J 2005; 26(5): 824-829.
26- Alzahrani AA, Al-Khaldi YM, Alsamghan AS. Prevalence of obesity among Saudi board residents in Aseer Region, Saudi Arabia. Saudi Journal of Obesity 2016; 4(1):13-19.
27- Al-Ghawi A, Uauy R. Study of the knowledge, attitudes and practices of physicians towards obesity management in primary health care in Bahrain. Public Health Nutrition 2009; 12(10): 1791–1798.
28- Barnett KG, Physician Obesity: The Tipping Point. Global Adv Health Med. 2014; 3(6):8-10.
29- Al-Ghamdi S, Shubair MM, Aldiab A, Al-Zahrani JM, Aldossari KK, Househ M, et al. Prevalence of overweight and obesity based on the body mass index; a cross-sectional study in Alkharj, Saudi Arabia. Lipids in Health and Disease 2018; 17:134.
30- Foster GD, Wadden TA, Makris AP, Davidson D, Sanderson RS, Allison DB, et al. Primary care physicians' attitudes about obesity and its treatment. Obes Res. 2003;11:1168-1177.
31- Warner CH, Warner CM, Morganstein J, Appenzeller GN, Rachal J, Grieger T. Military family physician attitudes toward treating obesity. Mil Med 2008; 173: 978–984.
32- Bleich SN, Bennett WL, Gudzune KA, Cooper LA. Impact of Physician BMI on Obesity Care and Beliefs. Obesity 2012; 20 (5): 999-1005.
33- Hash RB, Munna RK, Vogel RL, Bason JJ. Does physician weight affect perception of health advice? Prev Med. 2003; 36:41–44.
34- Laws RA, Jayasinghe UW, Harris MF, et al. Community Health SNAP Project Team. Explaining the variation in the management of lifestyle risk factors in primary health care: a multilevel cross-sectional study. BMC Public Health. 2009; 9:165.

Physical and Verbal Assault on Medical Staff in Emergency Hospital Departments in Abha City, Saudi Arabia

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Abstract

Background: Violence is a major social and public health problem. Health care workers are the most reported group at risk for violence due to direct contact with patients at critical situations. Violence against medical staff not only affects their work environment but is also a barrier against delivering good quality service, which will be reflected on patients' satisfaction.

Aim: To estimate prevalence, types and correlates of physical and verbal assault among medical staff working in emergency departments in Abha City, Saudi Arabia, 2018.

Methodology: A descriptive cross-sectional survey was applied targeting all staff working at different emergency departments in government hospitals in Abha city. Data were collected using a pretested valid and reliable questionnaire. The questionnaire was developed by ILO/ICN/WHO/PSI and was used for country case studies of workplace violence in the health sector.

Results: The research included 164 medical staff from emergency departments in three governmental hospitals in Abha City. Most of our sample were in direct contact with patients. Exposure to physical violence was recorded among 16.5% of participants while about half of the sample had been exposed to psychological assaults, being verbal, bullying, and/or threats.

Conclusions: This study documented the existence of workplace violence among emergency medical staff in Abha. Different types of physical and psychological violence for all categories were recorded.

Key words: Violence, medical staff, insult, emergency department, physical assault, psychological assault.

Background

Health workers are at high risk of violence all over the world. Between 8% and 38% of health workers are exposed to physical violence at certain areas during their career. Others may be threatened or exposed to verbal assault (1, 2). Most violence is perpetrated by patients, relatives and/or visitors. Also, in disasters and conflict situations, health care workers may become the targets of violence. Nurses and other staff, who are directly involved in patient care, are the most vulnerable group, including emergency room staff and paramedics (3, 4).

The World Health Organization (WHO) defined workplace violence as the intentional use of power, threatened or actual, against another person or against a group in work-related circumstances that either results in, or has a high degree of likelihood of resulting in injury, death, psychological harm, mal-development, or deprivation (5). Although violence (either physical or psychological) directed toward health care staff is classified as occupational hazard (6), the actual magnitude of the problem is definitely unknown, and recent surveys showed that the current figures represent only the tip of the iceberg.

As workplace violence has a negative impact on all sectors and all categories of workers, the health sector is at major risk. Violence in this sector may constitute almost 25% of all violence at work (7). Workplace violence is not merely the terrible, violent events that make the news; it is also a daily-recorded event, such as verbal abuse, that is often overlooked (8, 9).

Despite the fact that there are not definite indications about the form a violent event is going to take, it is possible to recognize several warning signs of violent behaviors. These warning signs include nervous movements and gestures, approaching very closely to the other person, raised voice tone, hitting walls or items, or hitting themselves in the head or chest, inappropriate laughter, and excessive sarcasm (10, 11).

The current study aimed to evaluate physical and verbal assault among staff working in emergency departments in Abha hospitals.

Methodology

A descriptive cross-sectional survey was conducted to target all staff working at different emergency departments in governmental hospitals in Abha city, including physicians, nurses, clerks, and employees. There are 3 main governmental emergency departments in Abha City which is the capital of Aseer Region at the southern region of Saudi Arabia. After having consent, data were collected using a pretested valid and reliable questionnaire. (12). The first part of the questionnaire was developed by the researchers after intensive literature review and expert consultation. This part of the questionnaire covered personal data, work history, medical history special habits and work place environment. The second part included violence assessment questionnaire. The questionnaire was developed by ILO/ICN/WHO/PSI and was used for country case studies of workplace violence in the health sector (12).

Data analysis

Data were extracted, revised, coded and fed into the Statistical Software (IBM SPSS version 22). All statistical analyses were done using two-tailed tests. Descriptive analysis, based on frequency and percent distribution, was done for all participants' demographic and work-related data, and types of violence. Association between staff personal data and violence exposure was assessed using Pearson's chi-square test. P values less than 0.05 was considered statistically significant.

Results

This research included 164 medical staff from emergency departments in governmental hospitals in Abha city. The male gender constituted 62.8%; most of them were married (60.4%), and the most frequent educational level was postgraduate (56.7%), then college (33.5%) and technical (9.8%). Doctors constituted the majority of the sample (66.5%) then nurses (23.8%) and lastly technicians (9.8%). All the sample were affiliated to the Ministry of Health. Participants' mean age was 30.2 ± 4.2 years, while the mean years of working was 6.4 ± 4.2 years (Table 1). Table 2 demonstrates participants' work environment. The work of 51.2% was between 6 pm to 7 am, and 80.5% were in direct contact with patients. Most of the sample interact with adults (47.6%) and 74.4% interact with both male and female patients. As for violence risk factors, most of the care givers (73.2%) were worried about being exposed to violence at their work place. Violence reporting procedures were absent in 40.9%, while 41.5% of participants reported physical violence and 17.7% reported verbal violence. Only 34.8% of the sample know how to use the procedure of violence reporting. Only 28% said there is encouragement to report acts of violence, and only 26.2% received training in managing violence, but most of the sample (91.2%) were in need of training in violence management.

Table 3 shows that 16.5% of staff was exposed to physical violence during the last 12 months. The frequency of attacks ranged from 1 to 4 times. All attacks were by persons of the age group from 20 to 40 years and all attackers were males. They had been attacked mostly after morning shifts. Most perpetrators were from patients' relatives (10.4%) and mostly by hands (9.1%). Most of the sample think the reasons for the attack were either patients being dissatisfied with doctor's work or poor communication with patients or their relatives. Security, colleagues, and other patients' relatives or themselves, had the main role in stopping the attack events (37%, 6.7%, and 3%, respectively). With regard to psychological assaults among participants, 45.7% of participants were exposed to violence, being verbal (57.3%), bullying (22.7%), or threat (44%). The action taken by management ranged from counseling (20.7%), speak/support (20.1%) or report

or sometimes a combination of these (20.1%). About 20% of the victims were dissatisfied about the actions taken after violence.

Table 4 shows that on relating the exposure to violence with victims' characteristics, it was clear that males were significantly more exposed to physical violence (P=0.02). There was no significant association between violence incidence and participants' marital status. All staff with direct contact with patients were significantly exposed to physical assault (P=.005). Participants' occupation showed significant difference, as doctors were more exposed to physical violence. Work in late shifts (between 6 pm to 7 am) also recorded no significant difference. Considering psychological violence, males were more exposed to psychological violence (62.7%) but with no significant difference when compared with those who were not exposed. Marital status recorded a significant difference with higher rates among married participants (70.7%). The occupation had significant differences as doctors were more exposed to psychological violence (62.7%). Also, all those exposed to psychological violence were in direct contact with patients.

Table 1: Sociodemographic characteristics of medical staff in emergency departments in Abha city, Saudi Arabia

Characteristics		No.	%
Gender	Male	103	62.8
	Female	61	37.2
Mental status	Single	54	32.9
	Married	99	60.4
	Divorced	11	6.7
Education	Post Graduate	93	56.7
	College	55	33.5
	Technical	16	9.8
Occupation	Doctor	109	66.5
	Nurse	39	23.8
	Technical	16	9.8
Age in years	Mean ± SD		30.2 ± 4.2
	Min - Max		21 - 40
Years of experience	Mean ± SD		6.4 ± 4.2
	Min - Max		20-Jan

Table 2: Workplace environment at emergency departments in Abha City, Saudi Arabia

Work environment		No	%
Work between 6 PM – 7AM	Yes	84	51.2
	No	80	48.8
Direct contact with patients	Yes	132	80.5
	No	32	19.5
Age group of patients commonly dealt with	Infant	4	2.4
	Adolescent	27	16.5
	Adult	78	47.6
	Elderly	23	14.0
	No	32	19.5
Gender of patients	Male	10	6.1
	Both	122	74.4
	No	32	19.5
How much worried about violence at workplace	Not	44	26.8
	Little	15	9.1
	Mild	60	36.6
	Worried	28	17.1
	Very Worried	17	10.4
Are there procedures for reporting violence?	No	67	40.9
	If physical	68	41.5
	If verbal	29	17.7
If yes, do you know how to use them?	No procedure	67	40.9
	Not Know	40	24.4
	Yes	57	34.8
Is there encouragement to report?	No	118	72.0
	Yes	46	28.0
Have you received training in managing violence?	No	121	73.8
	Yes	43	26.2
Need to be trained in violence management	No	16	9.8
	Yes	148	91.2

Table 3: Workplace violence at emergency departments in Abha City, Saudi Arabia

Violence data		No	%
Exposure to physical assault during the last 2 months	Yes	27	16.5
	No	137	83.5
If yes, how many times?	Mean ± SD	1.57 ± 1.38	
	Min – Max	0 - 4	
Who attacked you?	Patients	10	6.1
	Relatives	17	10.4
Weapon	Furniture	12	7.2
	Hand	15	9.1
Who has the biggest role to stop the event?	Self	5	3.0
	Colleague	11	6.7
	Another patient or relative	5	3.0
	Security	6	37.0
Exposure to psychological assault during last 12 months	Yes	75	45.7
	No	80	54.3
Type of psychological assault	Verbal	43	57.3
	Bullying/Mobbing	17	22.7
	Threat	33	44.0
Action taken by management	Counseling	34	20.7
	Speak or Report	33	20.1
	Other Support	33	20.1
How satisfied you are with action taken	Very Dissatisfied	32	19.5
	Dissatisfied	16	9.8
	Satisfied	10	6.1
	Very Satisfied	17	10.4

Table 4: Work Place violence at emergency departments in relation to staff characteristics in Abha City, Saudi Arabia

Personal data		Physical Violence		*P-value*	Psychological Violence		*P-value*
Gender	Male	22	81.5%	.020*	47	62.7%	.973
	Female	5	18.5%		28	37.3%	
Marital Status	Single	11	40.7	.251	22	29.3%	.002*
	Married	16	59.3%		53	70.7%	
	Divorced	0	0%		0	0%	
Occupation	Doctor	22	81.5%	.092	47	62.7%	.010*
	Nurse	5	18.5%		17	22.7%	
	Technical	0	0%		11	14.7%	
Work between 6 PM to 7 AM	Yes	11	40.7%	.365	43	57.3%	.151
	No	16	59.3%		32	42.7%	
Direct interaction with patient	Yes	27	100%	.005*	75	100%	.001*
	No	0	0%		0	0.0%	

Discussion

General definition of workplace violence incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involve an explicit or implicit challenge to their safety, well-being or health (13). While the existence of personal physical violence in the workplace has always been recognized, the existence of psychological violence has long been under-estimated and only now receives due attention. Violence includes the use of physical force against another person or group that results in physical, sexual or psychological harm. It includes among other aspects, beating, kicking, slapping, stabbing, shooting, pushing, biting and pinching which are all types of physical violence (14).

The current study revealed that about half of the staff were exposed to at least one type of physical or psychological assault. Physical assault only was recorded among 16.5% of the staff which was more frequent among male doctors than any other category. This may be explained by the nature of Arabic culture of usually introducing males for troublesome patients to protect females. Also, doctors are usually the main category facing the patient or their relatives for the clinical condition and the availability of the needed medical care. As for psychological assault, it was recorded among nearly 45% of the staff especially verbal assault and threat. Also doctors who were in direct contact with patients had the largest risk of assault. The disappointing findings were that more than 40% of violence cases were not reported, especially psychological assault. The other finding is that only one third of the staff knew how to report the violent event if they were exposed, which creates more violence as without reporting no punishment will be applied. Managers also took no action toward violent cases in about 40% of the situations, which helps in more violence with absence of staff awareness regarding how to deal with violence.

Violence against medical staff in Saudi Arabia seems to be increasing, as many cases were recorded in different cities (15-17). These studies reported all types of violence against all categories of health care providers even those who are working in primary health care units. Therefore, the Saudi Commission for Health Specialties stated that it would provide legal support to health workers who fall victim to verbal and physical attacks and sexual harassment. Those who attack health practitioners on duty will face 10 years in prison and a fine of up to one million Saudi Riyals. The Saudi Ministry of Health has stated that it would not show any leniency toward those who attack its staff members and will take all measures to ensure their protection. They added that: “We’ll take legal measures to protect their rights” (18).

In conclusion, the study revealed that workplace violence is common among emergency medical staff in Abha. The reported prevalence is consistent with international figures, highlighting the significantly high prevalence of workplace violence. The exposure included both physical and psychological violence with low reporting rate and little managerial support. Therefore, hospital administration should set standards and develop practical measures for preventing the incidence and for controlling the prevalence of violence against staff at emergency departments through the enhanced reporting of workplace violence. Policy makers should adopt and introduce a ‘zero tolerance policy’. Healthcare organizations, particularly hospitals, should fulfill their obligations to provide both staff and patients with a more secure workplace environment.

References

1. Violence against health workers. Cited at URL https://www.who.int/violence_injury_prevention/violence/workplace/en/. Last accessed on 21 September 2019.
2. Occupational Safety and Health Administration. Guidelines for preventing workplace violence for healthcare and social service workers (OSHA, 3148-04R). Washington, DC: OSHA, 2015.
3. Security Industry Association and International Association of Healthcare Security and Safety Foundation. Mitigating the risk of workplace violence in health care settings. Silver Spring, MD: Security Industry Association, August 2017.
4. Harrell E. Workplace violence, 1993-2009. Washington, DC: Department of Justice, Bureau of Justice Statistics, National Crime Victimization Survey, 2011.
5. World Health Organization. Violence: a public health priority. WHO global consultation on violence and health. Geneva: World Health Organization. 1996 Dec.
6. Whitley GG, Jacobson GA, Gawrys MT. The impact of violence in the health care setting upon nursing education. Journal of Nursing Education. 1996 May 1; 35(5):211-8.
7. Nordin, H. Fakta om vaold och hot I arbetet, Solna, Occupational Injury Information System, Swedish Board of Occupational Safety and Health.1995.
8. The Joint Commission. Behaviors that undermine a culture of safety. Sentinel Event Alert, 2008; 40.
9. The Joint Commission. The essential role of leadership in developing a safety culture. Sentinel Event Alert, 2017; 57.
10. Garnham P. Understanding and dealing with anger, aggression and violence. Nursing Standard 2001, 16(6), 37-42.
11. Distasio C. Protecting yourself from violence in the workplace. Nursing 2002, 32(6), 58-63.
12. International Labor Office/International Council of Nurses/World Health Organization/Public Services International. Workplace violence in the health sector: Country case studies research instruments: Survey questionnaire.2003.
13. AbuAlRub RF, Al-Asmar AH. Psychological violence in the workplace among Jordanian hospital nurses. Journal of Transcultural Nursing. 2014 Jan;25(1):6-14.
14. Krug EG, Mercy JA, Dahlberg LL, Zwi AB. The world report on violence and health. The Lancet. 2002 Oct 5;360(9339):1083-8.
15. Mohamed AG. Work-related assaults on nursing staff in Riyadh, Saudi Arabia. Journal of family & community medicine. 2002 Sep; 9(3):51.

16. El-Gilany AH, El-Wehady A, Amr M. Violence against primary health care workers in Al-Hassa, Saudi Arabia. Journal of interpersonal violence. 2010 Apr; 25(4):716-34.
17. Alsaleem SA, Alsabaani A, Alamri RS, Hadi RA, Alkhayri MH, Badawi KK, Badawi AG, Alshehri AA, Al-Bishi AM. Violence towards healthcare workers: A study conducted in Abha City, Saudi Arabia. Journal of family & community medicine. 2018 Sep; 25(3):188.
18. Violence against health workers on the rise. Available at http://saudigazette.com.sa/article/539258. Accessed on 26 Sept 2019.

What a low sensitivity of high density lipoproteins in the metabolic syndrome

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Abstract

Background: We tried to understand the significance of high density lipoproteins (HDL) in the metabolic syndrome.

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

Results: The study included 875 cases (370 males). Although the mean age increased just up to plasma triglycerides value of 200 mg/dL, the male ratio and smoking increased parallel to the increased plasma triglycerides values, continuously. Mean body mass index was only normal in patients with plasma triglycerides values lower than 60 mg/dL. Although fasting plasma glucose (FPG), hypertension (HT), diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), and chronic renal disease (CRD) increased parallel to the increased plasma triglycerides values continuously, low density lipoproteins (LDL), white coat hypertension (WCH), and coronary heart disease (CHD) increased just up to plasma triglycerides value of 200 mg/dL. On the other hand, the mean HDL values were similar in all of the five groups ($p>0.05$ between all).

Conclusions: Plasma triglycerides may behave as acute phase reactants indicating disseminated endothelial injury and atherosclerosis in the metabolic syndrome. FPG, LDL, WCH, HT, DM, COPD, CHD, and CRD were all deteriorated parallel to the increased male ratio, smoking, aging, excess weight, and plasma triglycerides values. Whereas the mean HDL values did't show any significant change parallel to the above parameters in none of the groups.

Key words: High density lipoproteins, metabolic syndrome, low density lipoproteins, triglycerides, male gender, smoking, excess weight, accelerated atherosclerosis

Introduction

Chronic low-grade endothelial inflammation may be the most common kind of vasculitis, and the leading cause of aging in human being (1-4). Much higher blood pressure (BP) of the afferent vasculature may be the major underlying cause by inducing recurrent injuries on endothelium. Probably whole afferent vasculature including capillaries are mainly involved in the process. Thus the term of venosclerosis is not as famous as atherosclerosis in the literature. Secondary to the chronic low-grade endothelial injury, inflammation, edema, and fibrosis, vascular walls thicken, their lumens narrow, and they lose their elastic natures, all of those reduce blood supply to the end-organs, and increase systolic BP further. Some of the well-known underlying causes and/or indicators of the inflammatory process are physical inactivity, animal-rich diet, overweight, smoking, alcohol, hypertriglyceridemia, hyperbetalipoproteinemia, impaired fasting glucose, impaired glucose tolerance, white coat hypertension (WCH), cancers, prolonged infections such as tuberculosis, and chronic inflammations such as rheumatologic disorders (5, 6). Some of the irreversible consequences of the chronic low-grade inflammatory process include obesity, hypertension (HT), diabetes mellitus (DM), cirrhosis, peripheric artery disease (PAD), chronic obstructive pulmonary disease (COPD), chronic renal disease (CRD), coronary heart disease (CHD), mesenteric ischemia, osteoporosis, stroke, other end-organ insufficiencies, early aging, and premature death (7-9). Although early withdrawal of the underlying factors may delay terminal consequences, after development of cirrhosis, COPD, CRD, CHD, PAD, stroke, or early aging, endothelial destructions can not be reversed effectively due to their fibrotic natures. The triggering etiologies and terminal consequences of the chronic low-grade inflammatory process are researched under the titles of metabolic syndrome, aging syndrome, or accelerated endothelial damage syndrome in the literature, extensively (10-13). Similarly, plasma lipoprotein levels probably are under dynamic control, and they may act as some acute phase reactants indicating disseminated inflammation anywhere of the body. Although its normal limits could not been determined clearly yet, high plasma triglycerides may be significant indicators of the metabolic syndrome (14). Due to the significant association between high plasma triglycerides and CHD, Adult Treatment Panel (ATP) III adopts lower cutpoints for triglycerides abnormalities than did ATP II (15, 16). Although ATP II determined the normal upper limit of triglycerides as 200 mg/dL in 1994, World Health Organisation in 1999 (17) and ATP III in 2001 reduced the normal upper limit as 150 mg/dL (16). Although these cutpoints, there are several reports about the lower and safer limits of the triglycerides in the literature (18, 19). Although the absolute significance of plasma triglycerides in the metabolic syndrome, role of high density lipoproteins (HDL) is suspicious (19). We tried to understand the significance of HDL in the metabolic syndrome in the present study.

Material and Methods

The study was performed in the Internal Medicine Polyclinic of the Dumlupinar University between August 2005 and March 2007. Consecutive patients above the age of 15 years were studied. Their medical histories were learnt, and a routine check up procedure including fasting plasma glucose (FPG), serum creatinine, liver function tests, markers of hepatitis viruses A, B, C and human immunodeficiency virus, triglycerides, low density lipoproteins (LDL), HDL, an electrocardiogram, and an abdominal ultrasonography was performed. A Doppler echocardiogram was performed just in required cases. Current daily smokers with six pack-months and cases with a history of three pack-years were accepted as smokers. Patients with devastating illnesses including type 1 DM, malignancies, hemodialysis, ascites, hyper- or hypothyroidism, and heart failure were excluded to avoid their possible effects on weight. Additionally, anti-hyperlipidemic drugs, metformin, and/or acarbose users were excluded to avoid their possible effects on blood lipid profiles or body weight (20, 21). Body mass index (BMI) of each case was calculated by the measurements of the Same Physician instead of verbal expressions. Weight in kilograms is divided by height in meters squared (16). Cases with an overnight FPG level of 126 mg/dL or greater on two occasions or already using antidiabetic medications were defined as diabetics (16). An oral glucose tolerance test with 75-gram glucose was performed in cases with a FPG level between 110 and 126 mg/dL, and diagnosis of cases with a 2-hour plasma glucose level of 200 mg/dL or greater is DM (16). CRD is diagnosed with a persistently elevated serum creatinine level of 1.3 mg/dL in males and 1.2 mg/dL in females. Additionally, office blood pressure (OBP) was checked after a 5-minute of rest in seated position with a mercury sphygmomanometer on three visits, and no smoking was permitted during the previous 2-hour. A 10-day twice daily measurement of blood pressure at home (HBP) was obtained in all cases after a 10-minute education about proper BP measurement techniques (22). An additional 24-hour ambulatory blood pressure monitoring was not required due to its similar effectivity with the HBP measurements (3). Eventually, HT is defined as a mean BP of 135/85 mmHg or higher on HBP measurements, and WCH as an OBP of 140/90 mmHg or higher but a mean HBP measurement of lower than 135/85 mmHg (22). An exercise electrocardiogram is performed just in cases with an abnormal electrocardiogram and/or angina pectoris. Coronary angiography is taken just for the exercise electrocardiogram positive cases. So CHD is diagnosed either angiographically or with the Doppler echocardiographic findings as the already developed movement disorders in the cardiac walls. The spirometric pulmonary function tests were performed in required cases and the criterion for diagnosis of COPD is post-bronchodilator forced expiratory volume in one second/forced vital capacity of less than 70% (23). Eventually, patients with plasma triglycerides values of lower than 60 mg/dL were put into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL or higher into the fifth groups, respectively. The mean age, male ratio, smoking,

BMI, FPG, triglycerides, LDL, HDL, WCH, HT, DM, COPD, CHD, and CRD were detected in each group and compared in between. Mann-Whitney U test, Independent-Samples T test, and comparison of proportions were used as the methods of statistical analyses.

Results

The study included 875 patients (505 females and 370 males), totally. The mean values of plasma triglycerides were 51.0, 78.3, 122.2, 174.1, and 325.8 mg/dL in the five groups, respectively. The mean age increased just up to the plasma triglycerides value of 200 mg/dL, and there was an increase of triglycerides about 7.8 mg/dL for each year of aging. Whereas the male ratio increased parallel to the increased plasma triglycerides values, continuously (30.9% versus 51.2%, p<0.001). Beside that the mean BMI values were 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five groups, respectively. In another word, only the cases with the plasma triglycerides values lower than 60 mg/dL had a normal mean BMI value. Although FPG, HT, DM, COPD, and CRD increased parallel to the increased plasma triglycerides values continuously, LDL, WCH, and CHD increased just up to the plasma triglycerides value of 200 mg/dL. Prevalence of smoking increased parallel to the increased plasma triglycerides values, continuously (16.6% versus 38.3%, p<0.001). Interestingly, the most significant increase of smoking was seen just after the plasma triglycerides value of 200 mg/dL without the effects of aging or excess weight. On the other hand, the mean HDL values did't show any change between none of the five groups, significantly (p>0.05 between all) (Table 1).

Discussion

Excess weight-induced chronic low-grade vascular endothelial inflammation may play a significant role in the pathophysiology of accelerated atherosclerotic process in whole body (24). Excess weight may be the most common cause of vasculitis worldwide, and the leading cause of major health problems in this century, since nearly three-fourths of cases above the age of 30 years have excess weight, nowadays (24). It leads to structural and functional abnormalities in many organ systems of the body (25). Adipose tissue produces leptin, tumor necrosis factor-alpha, plasminogen activator inhibitor-1, and adiponectin-like cytokines, all of those behave as acute phase reactants in the plasma (26). Beside that, excess weight may cause an increased blood volume as well as an increased cardiac output thought to be the result of an increased oxygen need of the excessive fat tissue. The prolonged increase in the blood volume may lead to myocardial hypertrophy, terminating with a decreased cardiac compliance. Additionally, FPG and total cholesterol (TC) increased parallel to the increased BMI values (27). Combination of these cardiovascular risk factors will eventually terminate with an increase in left ventricular stroke work and higher risks of arrhythmias, cardiac failure, and sudden cardiac death. Similarly, the prevalences of CHD and stroke increased parallel to the increased BMI values in another study (28), and risk of death from all causes including cancers increased throughout the range of moderate to severe weight excess in all age groups (29). The relationships between excess weight, increased BP, and higher plasma triglycerides values are described in the metabolic syndrome, extensively (14), and clinical manifestations of the syndrome include obesity, hypertriglyceridemia, hyperbetalipoproteinemia, HT, insulin resistance, and proinflammatory and prothrombotic states (12). Similarly, prevalences of smoking (42.2% versus 28.4%, p<0.01), excess weight (83.6% versus 70.6%, p<0.01), DM (16.3% versus 10.3%, p<0.05), and HT (23.2% versus 11.2%, p<0.001) were all higher in the hypertriglyceridemia group in another study (30). On the other hand, the prevalences of hyperbetalipoproteinemia were similar both in the hypertriglyceridemia (200 mg/dL or greater) and control groups (18.9% versus 16.3%, p>0.05, respectively) in the above study (30). Similarly, plasma LDL values increased just up to the plasma triglycerides value of 200 mg/dL in the present study. Beside that, the mean BMI values increased just up to the plasma triglycerides value of 150 mg/dL, significantly (p<0.05 for each step). According to our opinion, although excess weight does not affect each individual with the same severity, overweight, obesity, severe obesity, and morbid obesity histories of years should be added into the calendar age with various degrees during calculation of physiological age of the individuals.

Smoking and alcohol may be the second and third most common causes of vasculitis, worldwide. According to our experiences, both of them should be included into the major components of the metabolic syndrome since they cause chronic inflammation on the vascular endothelium, terminating with an accelerated atherosclerotic process all over the body. Tobacco's destructive effects are particularly prominent in the respiratory tract and lungs, probably due to the highest concentrations of toxic substances found in the cigarette smoke there. The strong and irreversible atherosclerotic effects of tobacco are the most clearly detected in the Buerger's disease. It is an obliterative vasculitis characterized by inflammatory changes in the small and medium-sized arteries and veins, and it has never been reported in the absence of smoking in the literature. Eventually, the atherosclerotic effects terminate with early aging, end-organ insufficiencies, and premature death. According to our clinical observations, although tobacco does not affect each individual with the same severity, the smoking history of pack-years should be added into the calendar age during calculation of physiological age of the patients. Probably, alcohol gives harm to vascular endothelium by means of the similar ways with smoking but alcohol's main targets are the gastrointestinal tract and liver due to the highest concentrations of alcohol and its products there. Thus the drinking history of drink-years should also be added into the calendar age during calculation of physiological age of the patients. Due to the very low prevalence of alcoholism in Turkey (31), we did not include regular alcohol intake into the present study. On the other hand, although alcoholic drinks provide extra calories for body, smoking in human and

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

Variable	Lower than 60 mg/dL	p-value	Lower than 100 mg/dL	p-value	Lower than 150 mg/dL	p-value	Lower than 200 mg/dL	p-value	200 mg/dL or greater
Number of cases	84		207		235		148		201
Age (year)	35.6 ± 16.4 (17-79)	0.000	43.6 ± 17.5 (16-83)	0.009	47.7 ± 15.3 (16-82)	0.018	51.2 ± 12.6 (19-82)	Ns*	49.8 ± 12.3 (19-88)
Male:ratio	30.9%	0.05>	39.1%	Ns	40.4%	Ns	43.9%	0.05>	51.2%
Smoking	16.6%	Ns	21.7%	Ns	26.3%	Ns	23.6%	0.0001>	38.3%
BMI† (kg/m²)	24.6 ± 5.3 (16.7-45.9)	0.002	27.1 ± 5.9 (16.7-49.3)	0.000	29.4 ± 6.1 (18.4-51.0)	Ns	29.9 ± 4.8 (19.2-49.0)	Ns	30.0 ± 5.0 (21.0-51.1)
FPG‡ (mg/dL)	96.5 ± 35.3 (71-377)	0.016	106.6 ± 48.7 (59-400)	Ns	106.8 ± 35.1 (71-335)	0.006	117.3 ± 47.8 (68-386)	Ns	124.3 ± 55.3 (74-392)
Triglycerides (mg/dL)	51.0 ± 7.5 (27-59)	0.000	78.3 ± 10.8 (60-99)	0.000	122.2 ± 14.5 (100-149)	0.000	174.1 ± 14.2 (150-199)	0.000	325.8 ± 160.4 (200-1.350)
LDL§ (mg/dL)	98.6 ± 23.3 (56-161)	0.000	114.6 ± 33.0 (31-269)	0.000	131.1 ± 31.7 (56-228)	0.033	137.5 ± 32.4 (50-237)	0.020	129.0 ± 40.8 (10-239)
HDL‖ (mg/dL)	44.9 ± 12.3 (24-77)	Ns	48.8 ± 11.6 (33-91)	Ns	46.4 ± 10.5 (27-80)	Ns	43.7 ± 9.0 (22-67)	Ns	43.1 ± 9.1 (25-70)
WCH**	17.8%	0.05>	24.1%	0.05>	31.0%	Ns	35.1%	Ns	32.3%
HT***	8.3%	0.0001>	15.9%	0.05>	21.2%	Ns	22.2%	Ns	26.3%
DM****	2.3%	0.0001>	11.1%	Ns	13.6%	Ns	18.2%	0.05>	24.3%
COPD*****	4.7%	0.01>	9.1%	0.01>	14.0%	Ns	12.8%	0.05>	18.4%
CHD******	4.7%	0.0001>	10.1%	Ns	11.4%	Ns	14.8%	Ns	11.9%
CRD*******	0.0%	Ns	1.9%	Ns	0.4%	0.01>	2.0%	0.01>	4.9%

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

nicotine administration in animals may be associated with a decreased BMI (32). Evidence revealed an increased energy expenditure during smoking both on rest and light physical activity (33), and nicotine supplied by patch after smoking cessation decreased caloric intake in a dose-related manner (34). According to an animal study, nicotine may lengthen intermeal time, and simultaneously decrease amount of meal eaten (35). Additionally, BMI seems to be the highest in former and lowest in current smokers (36). Smoking may be associated with a postcessation weight gain (37). Similarly, although CHD was detected with similar prevalences in both genders in a previous study (38), prevalences of smoking and COPD were higher in males against the higher BMI, LDL, triglycerides, WCH, HT, and DM in females. Additionally, the incidence of myocardial infarction is increased six-fold in women and three-fold in men who smoke 20 cigarettes per day (39). In another definition, smoking may be more dangerous for women probably due to the higher BMI and its consequences in them. So smoking is probably a powerful atherosclerotic risk factor with some suppressor effects on appetite (40). Smoking-induced appetite loss may be related with the smoking-induced vascular endothelial inflammation in whole body, since loss of appetite is one of the major symptoms of disseminated inflammation in the body. Physicians can even understand healing of patients by means of their normalizing appetite. Several toxic substances found in the cigarette smoke get into the circulation by means of the respiratory tract and lungs, and cause a vascular endothelial inflammation in whole body until the clearence from the circulation. But due to the repeated smoking habit of the individuals, the clearence never terminates. So the patients become ill with loss of appetite, permanently. In another explanation, smoking-induced weight loss is an indicator of being ill instead of being healthy (34-36). After smoking cessation, appetite normalizes with a prominent weight gain but the returned weights are the patients' physiological weights, actually.

The prevalence of excess weight increases by decades, particularly after the third decade, up to the eight decade of life (24). So 30th and 70th years of age may be the breaking points of life for weight, and aging may be the major determiner factor of excess weight. Probably, partially decreased physical and mental stresses after the age of 30 years, and debility and comorbid disorders-induced restrictions after the age of 70 years may be the major causes for the changes of BMI at these ages. Interestingly, the mean age and BMI increased just up to the plasma triglycerides values of 200 mg/dL and 150 mg/dL in the present study, respectively. So smoking was remained as the major causative factor of the hypertriglyceridemia above the plasma triglycerides value of 200 mg/dL. Beside that, the mean BMI values were 24.6, 27.1, 29.4, 29.9, and 30.0 kg/m2 in the five study groups, respectively. In another word, only cases with the plasma triglycerides values lower than 60 mg/dL had a normal mean BMI value. On the other hand, the mean age and triglycerides of the first group were 35.6 years and 51.0 mg/dL, respectively. They were 43.6 years and 78.3 mg/dL in the second, 47.7 years and 122.2 mg/dL in the third, and 51.2 years and 174.1 mg/dL in the fourth groups, respectively. In another definition, the triglycerides values increased about 7.8 mg/dL for each year of aging up to 200 mg/dL in the plasma. So aging alone may be another risk factor for chronic low-grade inflammation on vascular endothelium in whole body. Although ATP III reduced the normal upper limit of plasma triglycerides as 150 mg/dL in 2001 (16), the present study indicate that lower limits provide additional benefits for human health. Similar to a recent study (41), prevalence of smoking was the highest in the highest triglycerides having group in the present study that may also indicate inflammatory role of smoking in the metabolic syndrome, since triglycerides may behave as acute phase reactants in the plasma. FPG, BMI, HT, DM, COPD, and CRD increased parallel to the increased plasma triglycerides values from the first up to the fifth groups, gradually in the present study. As one of our opinions, significantly increased mean age by the increased plasma triglycerides values may be secondary to aging-induced decreased physical and mental stresses, which eventually terminates with excess weight and its consequences. Interestingly, although the mean age increased from the lowest triglycerides having group up to the triglycerides value of 200 mg/dL, then it decreased. The similar trend was also seen with the mean LDL values. These trends may be due to the fact that although the borderline high triglycerides values (150-199 mg/dL) is seen together with physical inactivity and overweight, the high (200-499 mg/dL) and very high triglycerides values (500 mg/dL and greater) may be secondary to genetic factors, smoking, and irreversible consequences of the metabolic syndrome including obesity, DM, HT, COPD, cirrhosis, CRD, PAD, CHD, and stroke (16). But although the underlying causes of the high and very high plasma triglycerides values may be a little bit different, probably risks of the terminal endpoints of the metabolic syndrome do not change in them. For example, prevalences of HT, DM, and COPD were the highest in the highest triglycerides having group in the present study. Eventually, although some authors reported that lipid assessment can be simplified by measurements of TC (42), the present study and most of the others indicated a causal relationship between higher triglycerides values and irreversible end-points of the metabolic syndrome (19, 43). On the other hand, although FPG, systolic and diastolic BP, TC, HDL, triglycerides, and mean age increased from the normal weight towards the overweight and obesity groups continuously, LDL did not show a continuous increase in the previous study (19), and the increase of TC values may just be due to the increases of HDL and triglycerides in the plasma (19). Whereas we studied a larger patients' group, and did even not detect the increase of HDL values in the present study.

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

smoking, aging, excess weight, and plasma triglycerides values. Whereas the mean HDL values did't show any significant change parallel to the above parameters in the present study.

References

1. Widlansky ME, Gokce N, Keaney JF Jr, Vita JA. The clinical implications of endothelial dysfunction. J Am Coll Cardiol 2003; 42(7): 1149–1160.
2. Ridker PM. High-sensitivity C-reactive protein: potential adjunct for global risk assessment in the primary prevention of cardiovascular disease. Circulation 2001; 103(13): 1813–1818.
3. Helvaci MR, Seyhanli M. What a high prevalence of white coat hypertension in society! Intern Med 2006; 45(10): 671-674.
4. Helvaci MR, Kaya H, Seyhanli M, Cosar E. White coat hypertension is associated with a greater all-cause mortality. J Health Sci 2007; 53(2): 156-160.
5. Helvaci MR, Aydin Y, Gundogdu M. Smoking induced atherosclerosis in cancers. HealthMED 2012; 6(11): 3744-3749.
6. Fodor JG, Tzerovska R, Dorner T, Rieder A. Do we diagnose and treat coronary heart disease differently in men and women? Wien Med Wochenschr 2004; 154(17-18): 423-425.
7. Helvaci MR, Kaya H, Yalcin A, Kuvandik G. Prevalence of white coat hypertension in underweight and overweight subjects. Int Heart J 2007; 48(5): 605-613.
8. Helvaci MR, Kaya H, Duru M, Yalcin A. What is the relationship between white coat hypertension and dyslipidemia? Int Heart J 2008; 49(1): 87-93.
9. Helvaci MR, Kaya H, Sevinc A, Camci C. Body weight and white coat hypertension. Pak J Med Sci 2009; 25(6): 916-921.
10. Eckel RH, Grundy SM, Zimmet PZ. The metabolic syndrome. Lancet 2005; 365(9468): 1415-1428.
11. Grundy SM, Brewer HB Jr, Cleeman JI, Smith SC Jr, Lenfant C. Definition of metabolic syndrome: Report of the National Heart, Lung, and Blood Institute/American Heart Association conference on scientific issues related to definition. Circulation 2004; 109(3): 433-438.
12. Tonkin AM. The metabolic syndrome(s)? Curr Atheroscler Rep 2004; 6(3): 165-166.
13. Franklin SS, Barboza MG, Pio JR, Wong ND. Blood pressure categories, hypertensive subtypes, and the metabolic syndrome. J Hypertens 2006; 24(10): 2009-2016.
14. Helvaci MR, Kaya H, Gundogdu M. Association of increased triglyceride levels in metabolic syndrome with coronary artery disease. Pak J Med Sci 2010; 26(3): 667-672.
15. National Cholesterol Education Program. Second Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel II). Circulation 1994; 89(3): 1333-1445.
16. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. Circulation 2002; 106(25): 3143-3421.
17. World Health Organization. Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications. Report of a WHO consultation 1999.
18. Helvaci MR, Tonyali O, Abyad A, Pocock L. The safest value of plasma triglycerides. World Family Med 2019; 17(7): 22-27.
19. Helvaci MR, Ayyildiz O, Gundogdu M, Aydin Y, Abyad A, Pocock L. Hyperlipoproteinemias may actually be acute phase reactants in the plasma. World Family Med 2018; 16(1): 7-10.
20. Helvaci MR, Kaya H, Borazan A, Ozer C, Seyhanli M, Yalcin A. Metformin and parameters of physical health. Intern Med 2008; 47(8): 697-703.
21. Helvaci MR, Aydin Y, Varan G, Abyad A, Pocock L. Acarbose versus metformin in the treatment of metabolic syndrome. World Family Med 2018; 16(5): 10-15.
22. O'Brien E, Asmar R, Beilin L, Imai Y, Mallion JM, Mancia G, et al. European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. J Hypertens 2003; 21(5): 821-848.
23. Vestbo J, Hurd SS, Agustí AG, Jones PW, Vogelmeier C, Anzueto A, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Respir Crit Care Med 2013; 187(4): 347-65.
24. Helvacı MR, Kaya H, Ozer C. Aging may be the major determiner factor of excess weight. Middle East J Age and Ageing 2008; 5(2).
25. Funahashi T, Nakamura T, Shimomura I, Maeda K, Kuriyama H, Takahashi M, et al. Role of adipocytokines on the pathogenesis of atherosclerosis in visceral obesity. Intern Med 1999; 38(2): 202–206.
26. Yudkin JS, Stehouwer CD, Emeis JJ, Coppack SW. C-reactive protein in healthy subjects: associations with obesity, insulin resistance, and endothelial dysfunction: a potential role for cytokines originating from adipose tissue? Arterioscler Thromb Vasc Biol 1999; 19(4): 972–978.
27. Zhou B, Wu Y, Yang J, Li Y, Zhang H, Zhao L. Overweight is an independent risk factor for cardiovascular disease in Chinese populations. Obes Rev 2002; 3(3): 147–156.
28. Zhou BF. Effect of body mass index on all-cause mortality and incidence of cardiovascular diseases--report for meta-analysis of prospective studies open optimal cut-off points of body mass index in Chinese adults. Biomed Environ Sci 2002; 15(3): 245–252.
29. Calle EE, Thun MJ, Petrelli JM, Rodriguez C, Heath CW Jr. Body-mass index and mortality in a prospective cohort of U.S. adults. N Engl J Med 1999; 341(15): 1097–1105.
30. Helvaci MR, Aydin LY, Maden E, Aydin Y. What is the relationship between hypertriglyceridemia and smoking? Middle East J Age and Ageing 2011; 8(6).
31. Helvaci MR, Yaprak M, Abyad A, Pocock L. Atherosclerotic background of hepatosteatosis in sickle cell diseases. World Family Med 2018; 16(3): 12-18.
32. Grunberg NE, Greenwood MR, Collins F, Epstein LH, Hatsukami D, Niaura R, et al. National working conference on smoking and body weight. Task Force 1: Mechanisms relevant to the relations between cigarette smoking and body weight. Health Psychol 1992; 11: 4-9.

33. Walker JF, Collins LC, Rowell PP, Goldsmith LJ, Moffatt RJ, Stamford BA. The effect of smoking on energy expenditure and plasma catecholamine and nicotine levels during light physical activity. Nicotine Tob Res 1999; 1(4): 365-370.
34. Hughes JR, Hatsukami DK. Effects of three doses of transdermal nicotine on post-cessation eating, hunger and weight. J Subst Abuse 1997; 9: 151-159.
35. Miyata G, Meguid MM, Varma M, Fetissov SO, Kim HJ. Nicotine alters the usual reciprocity between meal size and meal number in female rat. Physiol Behav 2001; 74(1-2): 169-176.
36. Laaksonen M, Rahkonen O, Prattala R. Smoking status and relative weight by educational level in Finland, 1978-1995. Prev Med 1998; 27(3): 431-437.
37. Froom P, Melamed S, Benbassat J. Smoking cessation and weight gain. J Fam Pract 1998; 46(6): 460-464.
38. Helvaci MR, Kaya H, Gundogdu M. Gender differences in coronary heart disease in Turkey. Pak J Med Sci 2012; 28(1): 40-44.
39. Prescott E, Hippe M, Schnohr P, Hein HO, Vestbo J. Smoking and risk of myocardial infarction in women and men: longitudinal population study. BMJ 1998; 316(7137): 1043-1047.
40. Helvaci MR, Aydin Y, Gundogdu M. Atherosclerotic effects of smoking and excess weight. J Obes Wt Loss Ther 2012; 2: 145.
41. Helvaci MR, Tonyali O, Abyad A, Pocock L. Smoking may be a cause of hypertriglyceridemia. World Family Med 2019; 17(8): 14-18.
42. Di Angelantonia E, Sarwar N, Perry P, Kaptoge S, Ray KK, Thompson A, et al. Major lipids, apolipoproteins, and risk of vascular disease. JAMA 2009; 302(18): 1993-2000.
43. Sarwar N, Sandhu MS, Ricketts SL, Butterworth AS, Di Angelantonia E, Boekholdt SM, et al. Triglyceride-mediated pathways and coronary disease: collaborative analysis of 101 studies. Lancet 2010; 375(9726): 1634-1639.

Knowledge, Attitude and Practice of Primary Health Care Physicians in Abha City about Common Psychiatric Disorders

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Abstract

Background: Primary health care physicians are the cornerstone of recognition, diagnosis, treatment and referral for all disorders, i.e., somatic, psychological, or psychosomatic, so the aim of study was to determine knowledge, attitude and practice of PHC physicians in Abha City regarding common psychiatric disorders.

Method: A cross-sectional study design was followed to include 101 Primary Health Care physicians in Abha City. An interview questionnaire was designed by the researcher. It included personal characteristics, knowledge Questionnaire, attitude assessment and Practice assessment.

Results: Most PHC physicians in Abha City (86.1%) have unsatisfactory knowledge about psychiatric disorders. Their knowledge gaps included “Who is at risk for major depression “ (18 %), “depression among children” (6.9%), “community services for people with dementia and their families” (7.9%) and “learning problems” (10.9%). Most PHC physicians in Abha City (88.1%) have a positive attitude toward management of psychiatric disorders. All PHCs (100%) diagnosed psychiatric patients during the last year. However, the majority of diagnosed cases (94.1%) were referred to a psychiatrist, while only 5.9% of PHC physicians prescribed treatment to their patients. Non-Saudi participants had a significantly higher percentage of satisfactory knowledge grade than Saudi participants (21.7% and 7.3%, respectively, p=0.036). PHC physicians who attended continuing medical education activities on mental health had significantly higher percentage of satisfactory knowledge grade than those who did not (35.7% and 10.3%, respectively, p=0.011). However, PHC physicians’ knowledge grades did not differ significantly according to their age group, gender, qualification, position, experience in PHC, or source of knowledge about mental health. Moreover, both their attitude and practice regarding management of psychiatric disorders did not differ significantly according to their personal characteristics.

Conclusions: Knowledge of PHC physicians in Abha City about psychiatric disorders is unsatisfactory, with several knowledge gaps. Their attitude toward management of psychiatric patients is mainly positive. Although all PHC physicians diagnose psychiatric diseases, they mostly refer their patients to a specialist. PHC physicians should be encouraged to attend continuing medical education sessions. Revision of the undergraduate medical curriculum and also the postgraduate curriculum of family medicine in order to enhance teaching of psychiatric disorders, especially covering those with identified knowledge gaps is recommended.

Key words: Psychiatric disorder, Physicians, Attitude, primary care

Introduction

Primary health care (PHC) physicians are the cornerstone of recognition, diagnosis, treatment, and referral for all disorders, i.e., somatic, psychological, or psychosomatic.[20]

Globally, psychiatric disorders constitute a major disease burden, which are often treated by non-psychiatrist health workers in PHC facilities. In PHC facilities, once patients are seen by non-psychiatric health workers, referral to psychiatrists or other mental health professionals is frequently unacceptable [12].

According to current data almost 50% of the population experience at least one psychological disorder in their lifetime, and at least 25% have suffered from a psychological disorder during the past 12 months [20]. About one-third of PHC patients have mental illness and one sixth of PHC consumers suffer from moderate to severe depression [2,3].

International epidemiological evidence suggests that, of all the people with psychological disorders who receive treatment minimal intervention is contributed from primary care physicians [7,8]. The countries in which the majority of psychiatric patients were seen in the general medical sector were Chile (80.3%), the Netherlands (74.6%), and Canada (65.7%), compared with the USA (43%) and Germany (36.6%) [5].

It is important to consider that non-psychiatric health workers at PHC facilities can play a pivotal role in the diagnosis and management of patients with mental illness [9]. PHC physicians frequently have a more intimate knowledge of the psychosocial context in which patients' distress and illnesses occur (i.e., interpersonal and family crises, occupational and employment problems, and State-of-the-art social, environmental, and financial difficulties) [20].

Nevertheless, even if PHC physicians were capable of handling psychiatric problems, they usually prefer such patients to be managed by specialist mental health institutions [11].

Moreover, people living with mental illness are less competent and unable to live productive lives which increases stigma toward persons with mental disorders despite knowledge in psychiatric disorders recognition, diagnosis and management by PHC physicians. Having knowledge of mental illness does not always reduce the stigmatizing attitudes [16].

Stigmatizing attitudes toward people with mental illness are common among all classes of people and expressed negative opinions toward consumers of mental health services is possibly due to the majority of the non-psychiatric health workers [18].

It is paradoxical that psychiatric disorders in PHC, and the way they are managed, remains poorly studied. This applies to the magnitude of the problem (i.e., frequency and type of mental disorders seen in PHC) and the more complex set of questions regarding the quality of care (accuracy of recognition, diagnosis, and management) [20].

The aim of the study was to determine knowledge, attitude and practice of primary health care physicians and associated factors in Abha City regarding common psychiatric disorders, 2017- 2018.

Subjects and Methods

A Cross sectional study was conducted at primary health care centers in Abha City. All physicians were included from all Ministry of Health primary health care centers in Abha City documented by Abha Health Sector (N=121). Primary health care physicians who had been working at PHC centers for at least one year were included in sample. Newly appointed primary health care physicians were excluded.

An interview questionnaire was designed and validated by the researcher. It included the following parts. 1. Personal characteristics: Age, gender, nationality, qualification, years of experience in primary health care. 2. KAP Questionnaire: Based on thorough review of relevant literature the researcher designed a study questionnaire that includes the following items. 3. Multiple-Choice Knowledge of Mental Illnesses Test (MC-KOMIT): The objective in developing the MC-KOMIT was to make a knowledge test pertaining to serious and prevalent mental illnesses. Questions were designed to cover 10 content areas, i.e., A. schizophrenia/ psychosis, B. depression, C. bipolar disorder/mania, D. personality disorders, E. post-traumatic stress disorder and other anxiety disorders, F. developmental disabilities, G. suicide, H. child/adolescent psychiatric disorders, I. alcohol and drug addiction, and J. Alzheimer's disease/dementia. Each of these content areas included 2 items from each of the following content domains: 1. causes/risks, 2. signs/symptoms, 3. course, 4. treatments, and 5. mental health services. For each question, there are 5 response options (A through to E). The responses (a correct answer and 4 distractors) were listed in alphabetical or chronological order. Test items were developed following standard, well-described multiple-choice question writing procedures, and were designed to avoid ambiguity, vagueness, and value-laden language [6].

Attitude assessment: It comprised 12 statements grouped within 4 factors, i.e., positive attitude (3 statements), helpless attitude (4 statements), avoidant attitude (4 statements) and biomedical orientation (one statement) [10]. Practice assessment: It comprised two statements, one for diagnosis and the other for management of psychiatric disorders.

Scoring of responses

Participants' correct answer regarding knowledge statements was assigned a score of (1), while an incorrect answer was assigned a score of (0). Therefore, participants' total scores ranged from 0 to 33. Positive

attitude responses were scored from 1 (strongly disagree) to 5 (strongly agree). Scoring for negative attitude was reversed (i.e., 1 for strongly agree and 5 for strongly disagree). Therefore, participants' total scores ranged from 12 to 60.

The total knowledge scores for each component were summed up and the percentage calculated for each participant. Those who obtained >75% of the total scores were considered to have "high" knowledge, those who obtained 60-79%, were considered to have "moderate" knowledge, while those who obtained <60% of the total scores were considered to have "poor" knowledge.

Similarly, total attitude scores were summed up and the percentage calculated for each participant. Those who obtained >60% of the total scores were considered to have a "positive" attitude, while those who obtained <60% were considered to have a "negative" attitude. The Statistical Package for Social Sciences (SPSS ver 23.0) was used for data entry and analysis. Descriptive statistics (i.e., frequency, percentage) were calculated and the appropriate test of significance (i.e., $X2$) was applied. A statistically significant level was considered when $p<0.05$.

Results

This study included all primary health care physicians'(121) inside Abha city during a period of 6 months. 101 physicians were interviewed and those who were on vacation or on sick leave as informed.

Table 1 shows that only 13.9% of participants attended continuing medical education courses on psychiatric disorders. The main sources of knowledge about psychiatric disorders were the internet websites (52.5%) and lectures (29.7%), followed by medical journals (23.8%) and textbooks (5.9%). Figure 1 shows that most primary care physicians in Abha City (86.1%) have unsatisfactory knowledge about psychiatric disorders. Table 2 shows that the topics least known by primary care physicians were "who is at risk for major depression" (18%), "depression among children" (6.9%), "community services for people with dementia and their families" (7.9%) and "learning problems" (10.9%). Figure 2 shows that most primary care physicians in Abha City (88.1%) have a positive attitude toward management of psychiatric disorders.

Table 3 shows that positive statements with the highest agreement by primary care physicians were: "It is possible to distinguish two main groups of depression: one psychological in origin and the other caused by biochemical mechanism" and "Antidepressants usually produce a satisfactory result in the treatment of depressed patients in general practice". On the other hand, negative statements with the highest agreement by primary care physicians were "If psychiatric patients need antidepressants, they are better off with a psychiatrist than with a general practitioner" and "Working with psychiatric patients is heavy going".

Table 4 shows that all primary care physicians (100%) diagnosed psychiatric patients during the last year. However, the majority of diagnosed cases (94.1%) were referred to a psychiatrist, while only 5.9% of primary care physicians prescribed treatment to their patients.

Table 5 shows that non-Saudi participants had a significantly higher percentage of satisfactory knowledge grade than Saudi participants (21.7% and 7.3%, respectively, p=0.036). Primary care physicians who attended continuing medical education activities on mental health had a significantly higher percentage of satisfactory knowledge grade than those who did not (35.7% and 10.3%, respectively, p=0.011). However, primary care physicians' knowledge grades did not differ significantly according to their age group, gender, qualification, position, experience in primary care, or source of knowledge about mental health.

Table 6 shows that primary care physician's attitude towards management of psychiatric disorders did not differ significantly according to their personal characteristics.

Table 7 shows that primary care physicians' practice related to management of psychiatric patients did not differ significantly according to their personal characteristics.

Table 1: Personal characteristics of study sample (n: 101)

Personal characteristics	No.	%
Age groups		
• <30 years	40	39.6
• 30-40 years	49	48.5
• >40 years	12	11.9
Gender		
• Male	63	62.4
• Female	38	37.6
Nationality		
• Saudi	55	54.5
• Non-Saudi	46	45.5
Qualification		
• MBBS	40	39.6
• Diploma	18	17.8
• Master	19	18.8
• Doctorate/Fellowship	24	23.8
Position		
• General practitioner	59	58.4
• Specialist	27	26.7
• Consultant	15	14.9
Experience in primary care		
• <5 years	54	53.5
• 5+ years	47	46.5
Attending CME on mental health		
• Yes	14	13.9
• No	87	86.1
Sources of knowledge about mental health		
• Textbooks	6	5.9
• Internet websites	53	52.5
• Lectures	30	29.7
• Journals	24	23.8

Figure 1: Primary care physicians' knowledge grades about psychiatric disorders

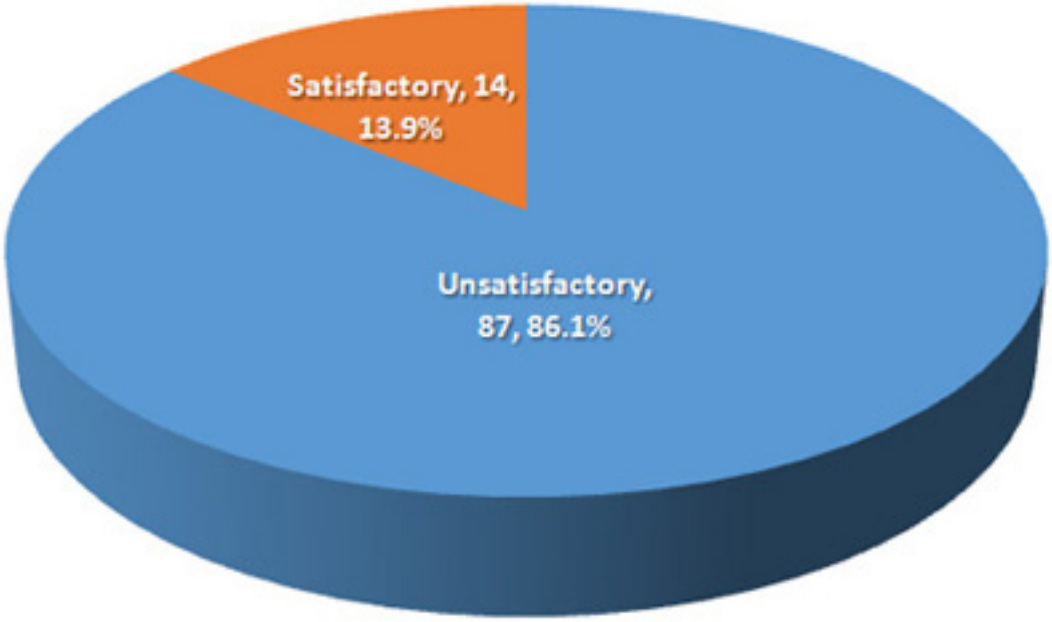


Table 2: Participants' correct responses regarding knowledge about different topics of psychiatric disorders

	Topic		No.	%
A	1.	Reasons for non-compliance to medication in schizophrenia	51	50.5
B	2.	Risk factors for depression	18	18.4
B	3.	Screening for depression	43	42.6
B	4.	Main physicians who treat depression	44	43.6
C	5.	Common signs of mania	21	20.8
C	6.	Diagnosis of mania	23	22.8
D	7.	Common age groups for personality disorders	31	30.7
D	8.	Dependent personality disorder	40	39.6
E	9.	Symptoms of obsessive– compulsive disorder	43	42.6
E	10.	10- management of obsessive-compulsive disorder	12	11.9
E	11.	11-Grief and loss processing	25	24.8
E	12.	Management of anxiety	56	55.4
E	13.	Abusive or neglecting parents	43	42.6
E	14.	Scope for treatment with psychotherapy	14	13.9
F	15.	Developmental disability	19	18.8
F	16.	Features of developmental disabilities	40	39.6
F	17.	Learning problems	11	10.9
F	18.	Treatment approach for developmental disabilities	74	73.7
F	19.	Medical treatment for mental retardation	45	44.6
G	20.	Suicidal thoughts	34	33.7
H	21.	Depression among children	7	6.9
H	22.	Likely causes of ADHD in children	14	13.9
H	23.	Common signs of oppositional defiant disorder in childhood	40	39.6
H	24.	Psychiatric medicines for children	30	29.7
H	25.	Genetic tendency toward developing an illness	45	44.6
I	26.	Alcohol abuse after posttraumatic stress disorder	36	35.6
I	27.	Denial due to substance abuse	29	28.7
I	28.	Description of addiction	44	43.6
I	29.	Withdrawal symptoms due to alcohol abuse	13	12.9
J	30.	Most common long-term course of dementia	59	58.4
J	31.	Assisting living facility	30	29.7
J	32.	Community services for people with dementia and their families	8	7.9

Table 3: Participants' responses regarding attitude toward psychiatric disorders

Statement	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
It is my responsibility to recognize psychiatric patients	16	15.8	18	17.8	40	39.6	14	13.9	13	12.9
It is my responsibility to treat psychiatric patients	6	5.9	18	17.8	42	41.6	23	22.8	12	11.9
It is rewarding to spend time looking after psychiatric patients	7	6.9	20	19.8	41	40.6	20	19.8	13	12.9
Psychiatric disorders reflect a characteristic response in patients which is not amenable to change	6	5.9	21	20.8	38	37.6	22	21.8	14	13.9
Becoming a psychiatric patient is a way that people with poor stamina deal with life difficulties	7	6.9	17	16.8	45	44.6	17	16.8	15	14.9
The majority of psychiatric disorders seen in primary care originate from patients' recent misfortunes	3	3.0	11	10.9	42	41.6	25	24.8	20	19.8
Most psychiatric disorders seen in primary care improve without medication	1	1.0	14	13.9	41	40.6	27	26.7	18	17.8
Working with psychiatric patients is heavy going	1	1.0	10	9.9	45	44.6	31	30.7	14	13.9
If psychiatric patients need antidepressants, they are better off with a psychiatrist than with a general practitioner	1	1.0	10	9.9	45	44.6	32	31.7	13	12.9
It is difficult to differentiate whether patients are presenting with unhappiness or a clinical depressive disorder that needs treatment	1	1.0	18	17.8	38	37.6	29	28.7	15	14.9
It is possible to distinguish two main groups of depression: one psychological in origin and the other caused by biochemical mechanism	2	2.0	12	11.9	46	45.5	46	45.5	31	30.7
Antidepressants usually produce a satisfactory result in the treatment of depressed patients in general practice	2	2.0	6	5.9	37	36.6	37	36.6	19	18.8

Table 4: Primary care physicians' practices regarding diagnosis and management of psychiatric patients

Variable	No.	%
• Diagnosis	101	100.0
• Treatment	6	5.9
• Referral	95	94.1

Table 5: Primary care physicians' knowledge grades regarding psychiatric disease according to their personal characteristics

Personal characteristics	Unsatisfactory		Satisfactory		P Value
	No.	%	No.	%	
Age groups					
<30 years	36	90.0	4	10.0	
30-40 years	41	83.7	8	16.3	
>40 years	10	83.3	2	16.7	0.661
Gender					
Male	57	90.5	6	9.5	
Female	30	78.9	8	21.1	0.104
Nationality					
Saudi	51	92.7	4	7.3	
Non-Saudi	36	78.3	10	21.7	0.036
Qualification					
MBBS	35	87.5	5	12.5	
Diploma	17	94.4	1	5.6	
Master	15	78.9	4	21.1	
Doctorate/Fellowship	20	83.3	4	16.7	0.555
Position					
General practitioner	53	89.8	6	10.2	
Specialist	23	85.2	4	14.8	
Consultant	11	73.3	4	26.7	0.252
Experience in primary care					
<5 years	48	88.9	6	11.1	
5+ years	39	83.0	8	17.0	0.391
Attending CME on mental health					
Yes	9	64.3	5	35.7	
No	78	89.7	9	10.3	0.011
Sources of knowledge					
Textbooks	5	83.3	1	16.7	
Internet websites	40	75.5	13	24.5	
Lectures	22	73.3	8	26.7	
Journals	18	75.0	6	25.0	0.965

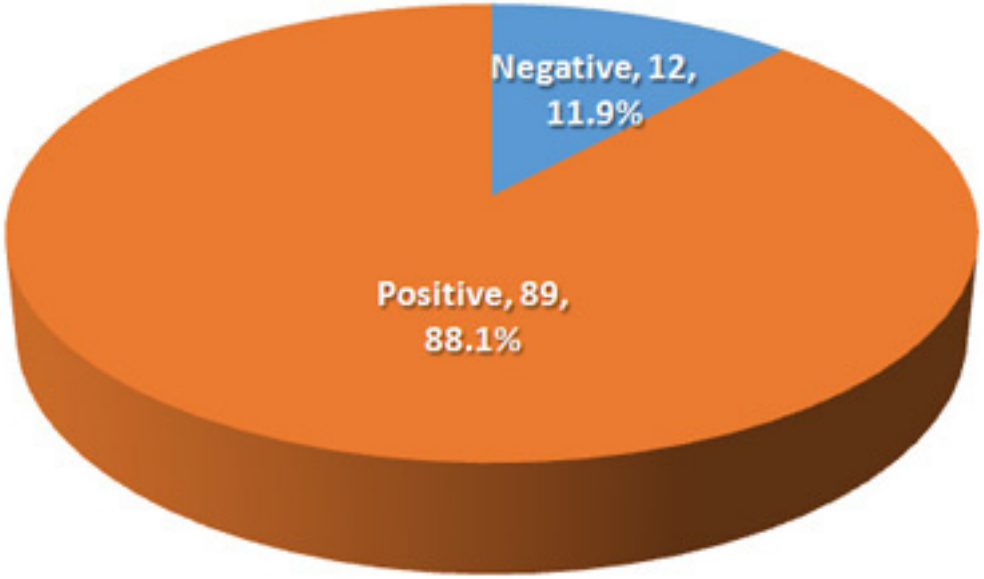
Table 6: Primary care physicians' attitude regarding management of psychiatric cases according to their personal characteristics

Personal characteristics	Unsatisfactory		Satisfactory		P Value
	No.	%	No.	%	
Age groups					
• <30 years	5	12.5	35	87.5	
• 30-40 years	6	12.2	43	87.8	
• >40 years	1	8.3	11	91.7	0.921
Gender					
• Male	8	12.7	55	87.3	
• Female	4	10.5	34	89.5	0.744
Nationality					
• Saudi	8	14.5	47	85.5	
• Non-Saudi	4	8.7	42	91.3	0.366
Qualification					
• MBBS	5	12.5	35	87.5	
• Diploma	2	11.1	16	88.9	
• Master	1	5.3	18	94.7	
• Doctorate/Fellowship	4	16.7	20	83.3	0.719
Position					
• General practitioner	6	10.2	53	89.8	
• Specialist	4	14.8	23	85.2	
• Consultant	2	13.3	13	86.7	0.812
Experience in primary care					
• <5 years	5	9.3	49	90.7	
• 5+ years	7	14.9	40	85.1	0.383
Attending CME on mental health					
• Yes	2	14.3	12	85.7	
• No	10	11.5	77	88.5	0.764
Sources of knowledge					
• Textbooks	0	0.0	6	100.0	
• Internet websites	6	11.3	47	88.7	
• Lectures	3	10.0	27	90.0	
• Journals	4	16.7	20	83.3	0.688

Table 7: Primary care physicians' practices regarding management of psychiatric cases according to their personal characteristics

Personal characteristics	Treatment		Referral		P Value
	No.	%	No.	%	
Age groups					
• <30 years	4	10.0	36	90.0	
• 30-40 years	1	2.0	48	98.0	
• >40 years	1	8.3	11	91.7	0.268
Gender					
• Male	5	7.9	58	92.1	
• Female	1	2.6	37	97.4	0.275
Nationality					
• Saudi	5	9.1	50	90.9	
• Non-Saudi	1	2.2	45	97.8	0.143
Qualification					
• MBBS	2	5.0	38	95.0	
• Diploma	1	5.6	17	94.4	
• Master	3	15.8	16	84.2	
• Doctorate/Fellowship	0	0.0	24	100.0	0.181
Position					
• General practitioner	3	5.1	56	94.9	
• Specialist	3	11.1	24	88.9	
• Consultant	0	0.0	15	100.0	0.314
Experience in primary care					
• <5 years	4	7.4	50	92.6	
• 5+ years	2	4.3	45	95.7	0.504
Attending CME on mental health					
• Yes	1	7.1	13	92.9	
• No	5	5.7	82	94.3	0.838
Sources of knowledge					
• Textbooks	1	16.7	5	83.3	
• Internet websites	3	5.7	50	94.3	
• Lectures	1	3.3	29	96.7	
• Journals	2	8.3	22	91.7	0.622

Figure 2: Primary care physicians' attitude toward management of psychiatric disorders



Discussion

The World Health Organization [21] stated that there is a wide gap between community mental health needs and their availability in many countries. Therefore, the integration of mental health into primary health care can be the solution to this gap suggested by Patel [13].

Wittchen et al.[20] noted that the rapidly accumulating knowledge in clinical neuroscience and clinical psychology has resulted in many new treatment options which can mostly be applied in primary health care settings .

Results of this study revealed that most primary care physicians in Abha City have unsatisfactory knowledge about psychiatric disorders. Their knowledge gaps in psychiatric disorders were mainly related to “who is at risk for major depression”, “depression among children”, and “community services for people with dementia and their families”.

Findings of this study also showed that most primary care physicians in Abha City have a positive attitude toward management of psychiatric disorders. Moreover, all primary care physicians diagnosed psychiatric patients during the last year. However, the majority of diagnosed cases were referred to a psychiatrist, while only 5.9% of primary care physicians prescribed treatment to their patients.

This study showed that non-Saudi participants had a significantly higher percentage of satisfactory knowledge grade than Saudi participants. Moreover, primary care physicians who attended continuing medical education activities on mental health had a significantly higher percentage of satisfactory knowledge grade than those who did not. However, primary care physicians’ knowledge grades did not differ significantly according to their age group, gender, qualification, position, experience in primary care, or source of knowledge about mental health. In addition, primary care physician’s attitude and practice regarding management of psychiatric disorders did not differ significantly according to their personal characteristics.

The significantly better knowledge among non-Saudi primary care physicians can be explained by the highly selective criteria applied on non-Saudi physicians who apply for a contract at the Saudi Ministry of Health, which allows for employing the best. Moreover, the contracts of those who prove to be below an acceptable standard are not renewed.

Abiodun [1] stated that proper integration of mental health care into primary health care services necessitates the application of continuing training programs for primary health care physicians. There is also a need to revise the current mental health component of the undergraduate curricula of medical students in order to increase the scope of their theoretical and clinical exposure, in keeping with the new demands which they now have to cope with in the provision of mental health care at primary care level.

Roy-Byrne[15] and Kroenke et al.[8] emphasized that Mental health problems, and anxiety disorders in particular, are common in primary care. However, although they are as common as depression, they often receive less attention and they remain unrecognized and untreated.

Rollman et al.[14] and Tylee and Walters [19] observed that the high rates of co-morbidity with psychiatric disorders and physical illnesses result in varying and misleading presentations. The patients do not usually link their health issues to psychological problems.

Lappalainen-Lehto et al.[9] argued that, although non-psychiatric physicians at primary care facilities may acknowledge their responsibility for management of psychiatric patients.

The present study showed that only 13.9% of primary care physicians attended continuing medical education on psychiatric disorders and those who attended were significantly more knowledgeable. Moreover, the main sources of primary care physicians’ knowledge about psychiatric disorders were the internet websites and lectures, followed by medical journals and textbooks.

Variations in reported sources of physicians’ knowledge can be explained by the recent advancement in internet technologies and most of the educational materials and health messages on neuroscience and psychiatry nowadays are posted online by the Saudi Ministry of Health, which may have encouraged primary care physicians to use the widely available internet technology to gain access to this subject.

Conclusion

Based on findings of the present study, it can be concluded that knowledge of primary care physicians in Abha City about psychiatric disorders is unsatisfactory, while their attitude is mainly positive toward management of these diseases. Psychiatric disorders are common at primary care practice. However, most primary care physicians refer their psychiatric cases to a specialist and only few prescribe treatment. Most primary care physicians do not receive continuing medical education on psychiatric disorders. Receiving continuing medical education is associated with significantly better knowledge. Most of primary care physicians are self-learners through internet websites, and reading medical journals or textbooks. Saudi physicians are less knowledgeable than non-Saudi physiciansregarding psychiatric disorders. However, physicians’ attitude and practice did not differ significantly according to their personal characteristics. Primary care physicians should be encouraged to attend continuing medical education sessions (e.g. conferences, workshops, lectures and presentations).

Posting educational materials and health messages on neuroscience and psychiatry nowadays online by the Saudi Ministry of Health is to encourage primary care physicians to use the widely available internet technology to gain access to this subject and update their knowledge.

Revision of the undergraduate medical curriculum in order to enhance teaching of psychiatric disorders, especially covering those with identified knowledge gaps is recommended.

References

1. Abiodun OA. Knowledge and Attitude Concerning Mental Health of Primary Health Care Workers in Nigeria. The International Journal of Social Psychiatry 1991; 37(2):113-120.
2. Al-Dabal BK, Koura MR, Al-Sowielem LS. Magnitude of depression problem among primary care consumers in Saudi Arabia. International Journal of Medical Science and Public Health 2015; 4(2): 205-210.
3. Al-Khathami AD, Ogbeide DO. Prevalence of mental illness among Saudi adult primary-care patients in Central Saudi Arabia. Saudi Med J. 2002;23(6):721-4.
4. Andrade L, Caraveo-Anduaga JJ, Berglund P, et al. Cross-national comparisons of the prevalence and correlates of mental disorders. Bull World Health Organ. 2000; 78:413-426.
5. Bijl RV, de Graaf R, Hiripi E, et al. The prevalence of treated and untreated mental disorders in five countries. Health Affairs 2003; 22:122-133.
6. Compton MT, Hankerson-Dyson D, Broussard B. Development, item analysis, and initial reliability and validity of a multiple-choice knowledge of mental illnesses test for lay samples. Psychiatry Research 2011; 189:141–148
7. Jacobi F, Wittchen HU, Hölting C, et al. Prevalence, comorbidity and correlates of mental disorders in the general population: Results from the German Health interview and examination Survey (GHS). Psychol Med. 2004;34(4):597-611.
8. Kroenke K, Spitzer RL, Williams JB, Monahan PO, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. Ann Intern Med 2007; 146(5):317-25.
9. Lappalainen-Lehto R, Seppa K, and Nordback I. Cutting down substance abuse: present state and vision among surgeons and nurses. Addictive Behaviour 2005; 30: (5)1013-1018.
10. Liu SI, Lu RB, Lee MB. Non-psychiatric physicians' knowledge, attitudes and behavior toward depression. J Formos Med Assoc. 2008;107(12):921-31.
11. Muga FA, Jenkins R. Training, attitude and practice of district health workers in Kenya. Soc Psychiatry Psychiatr Epidemiol 2008; 43:477–482.
12. Ndetei DM, Khasakhala LI, Mutiso V, Mbwayo AW. Knowledge, attitude and practice (KAP) of mental illness among staff in general medical facilities in Kenya: Practice and policy implications. Afr J Psychiatry 2011; 14:225-235.
13. Patel V. The future of psychiatry in low- and middle-income countries. Psychol Med. 2009, 39 (11): 1759-1762.
14. Rollman BL, Belnap BH, Mazumdar S, Zhu F, Kroenke K, Schulberg HC, Shear MK. Symptomatic severity of Prime-MD diagnosed episodes of panic and generalized anxiety disorder in primary care. J Gen Intern Med 2005; 20(7):623-28.
15. Roy-Byrne PP, Wagner A. Primary care perspectives on generalized anxiety disorder. J Clin Psychiatry 2004; 65(Suppl 13):20-6.
16. Schulze B. Stigma and mental health professionals: a review of the evidence on an intricate relationship. International Review of Psychiatry 2007; 19 (2):137-155.
17. Staab J, Datto CJ, Weinrieb RM, Gariti P, Rynn M, Evans DL. Detection and diagnosis of psychiatric disorders in primary medical care settings. Medical Clinics of North America 2001; 85(3): 579-596.
18. Thiru GS, Yad MJ. Are mental health professionals immune to stigmatizing beliefs? Psychiatr Serv 2005; 56:610.
19. Tylee A, Walters P. Under recognition of anxiety and mood disorders in primary care: why does the problem exist and what can be done? J Clin Psychiatry 2007; 68(Suppl 2):27-30.
20. Wittchen HU, Mühlig S, Beesdo K. Mental disorders in primary care. Dialogues Clin Neurosci. 2003; 5:115-128.
21. World Health Organization of Family Doctors (Wonca). Integrating mental health into primary care: A global perspective. 2008, Geneva: WHO.
22. Zabihi MH, Kayhani M, Rabi M, Mohammadi MR. A Survey of Knowledge and Attitude of Non-Psychiatrists (Medical Specialists) Treating Major Depression. Thrita Stud J Med Sci. 2012;1(1):30-3.

Postnatal Care of Patients With Gestational Diabetes In Primary Care

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Abstract

Background: Pregnant women with gestational diabetes mellitus (GDM) and their children carry high risk of future type 2 diabetes mellitus and metabolic abnormalities. Early diagnosis of GDM and prompt management, as well as postpartum follow up and preventative care can reduce this future risk. The main objective of this study was to assess the postpartum follow up of GDM patients and to examine the local protocols and policies in place to ensure adherence to national guidelines.

Methods: An initial audit was completed at a local health practice in Scotland, UK by enquiring about the local protocols in place for high risk patients, from all partners and practice staff, by searching for any printed forms or tools available in practice locally and by searching for any online protocols or guidelines at NHS Lanarkshire website. Based on the initial findings, several changes were proposed, agreed by all the staff and implemented for appropriate follow-up of GDM patients postnatally. Secondary data collection was performed 8 weeks after implementation to assess adherence to proposed changes.

Literature Review: A short literature review was conducted to obtain evidence-based recommendations from national guidelines and protocols for appropriate identification and management of GDM patients postnatally.

Results: Preliminary data revealed that there were no formal follow up protocols in place however after the Proforma suggestion it was decided to make the necessary changes for follow up of high risk discharged patients. Data collection over a 2 month period revealed successful implementation of the suggested protocol resulting in identification and follow up of all GDM patients.

Conclusion: Initially there was no formal mechanism in place to identify high risk GDM patients postnatally for follow up. Once the necessary changes were implemented, it led to successful identification and management of all GDM patients in primary care after discharge from hospital. However, this approach does have some limitations due to additional factors such as the availability and experience of the workforce, IT related issues, and geographical relocation of patients which are beyond control and scope of this project.

Key words: postnatal care, gestational diabetes, primary care

Introduction

Gestational diabetes mellitus (GDM) is defined as "Glucose intolerance of variable severity, with first recognition or showing onset during pregnancy". This includes those with impaired glucose tolerance which reverts back to normal levels after delivery and also those with undiagnosed type 1 or type 2 diabetes (1). GDM usually affects during the second or third trimester of pregnancy. However, if diagnosed during the first trimester then most likely it pre-existed as undiagnosed diabetes before pregnancy (2). It occurs in 3-5% of all pregnancies, in other words 1 in 20 pregnant women will develop GDM at some stage (3). The prevalence of diabetes in pregnancy is increasing in the U.S, with GDM comprising the major part and the remainder divided between pre-gestational type 1 and type 2 (4). In the UK, approximately 700,000 women give birth each year in England and Wales, 5% of these pregnant women (35,000) have either GDM or pre-existing diabetes. Out of these 5% women, the majority (87.5%) have GDM, with 7.5% type 1 and the remainder 5% with type 2 (5).

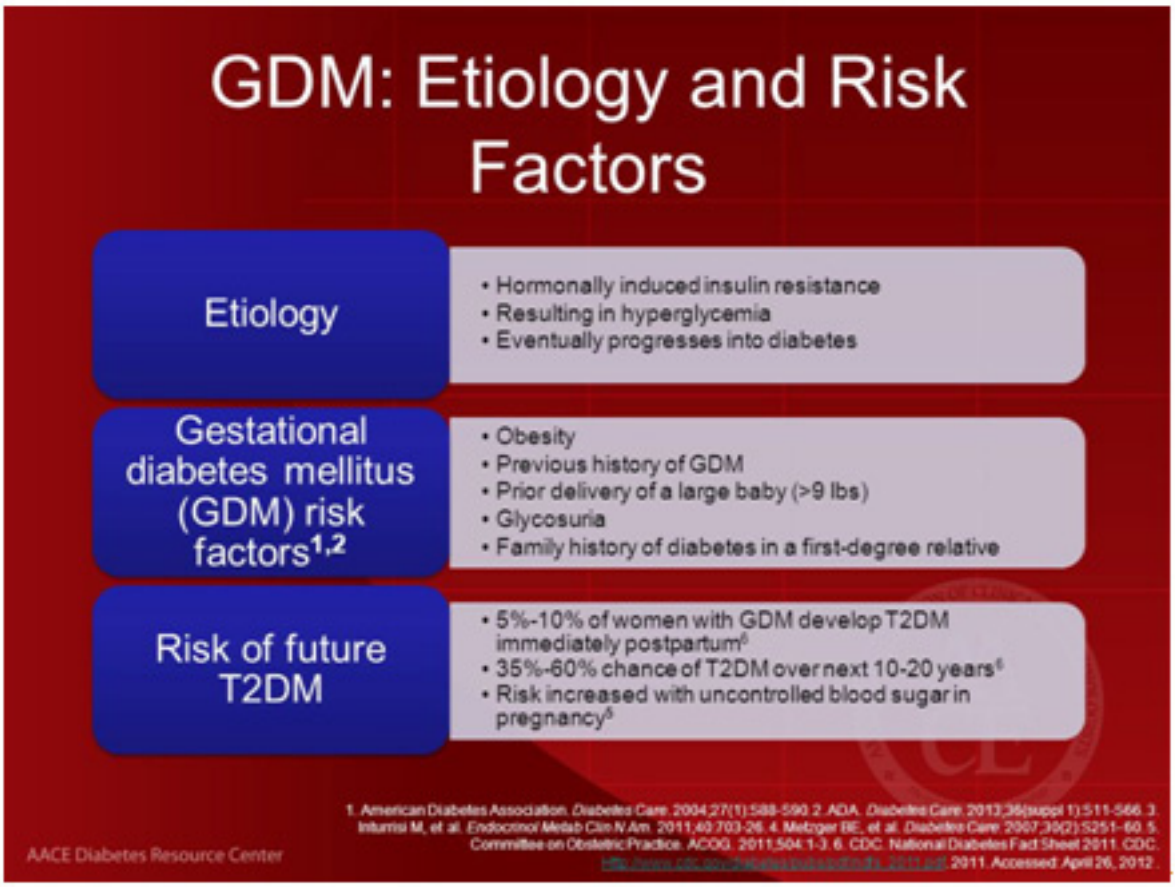
GDM increases the risk of developing type 2 diabetes postnatally. Women with previous GDM have a seven-fold increased risk of developing type 2 diabetes later in life (6). As per NICE (National Institute of Clinical Excellence) guidelines, 50% of women diagnosed with GDM develop type 2 diabetes within five years of giving birth (6)(7). GDM causes both insulin resistance and impaired insulin secretion and shares the same risk factors as of type 2 diabetes (Figure 1). GDM is a precursor of type 2 DM in predisposed women who face metabolic challenges of pregnancy (8). Women with the following risk factors are at an increased risk of developing GDM (1)(2)(9).

- BMI of > 30 kg/m2
- Previous macrosomic baby weighing ≥ 4.5 kg
- GDM in previous pregnancies
- Family history of diabetes with a first degree relative with diabetes
- Ethnic background with a high prevalence of diabetes in Asian, Black, Caribbean and Middle Eastern origin.

Aims and Objectives

Scottish Intercollegiate Guidelines Network (SIGN) guidelines recommend that all women with GDM should have their glucose tolerance reassessed at least 6 weeks postnatally with a minimum of fasting blood sugar test (FBST) and with 75gm Oral Glucose Tolerance Test (OGTT) if clinically indicated. They should be given advice regarding diet, weight control and exercise and an annual assessment using HbA1c or FBST should be carried out thereafter (1). Women previously diagnosed with GDM and whose blood glucose levels returned to normal after birth, should be offered a FBST by 6 to 13 weeks postnatally. If a FBST is not performed by 13 weeks then they should be offered a fasting glucose test or HbA1c test in cases where fasting glucose test is not possible. NICE does not recommend routinely offering a 75gm OGTT, instead an annual HbA1c test should be offered thereafter (9). As per the Canadian Diabetes Association, a postpartum

Figure 1: Taken from AACE Diabetes Resource Centre – Power Point Presentation (10)



FBST alone can miss up to 40% cases of dysglycemia so a 75gm OGTT should be done between 6 weeks to 6 months (11).

Out of nearly 800 women diagnosed with GDM in England, only 102 (13%) received one or more postnatal blood tests as per the above guidelines (12). In Scotland, there has been a nine fold increase in cases of GDM from 1981 to 2012 with a prevalence of 1.9% in 2012, confirming that the reporting and follow up of GDM was low in Scotland (13). The aim and objective of this work-based project was to introduce a systematic approach providing postnatal care and follow up to patients diagnosed with GDM in primary care after delivery. The current practice at a local primary care practice in South Lanarkshire, Scotland, had no set standards or protocols in place for follow up of these patients in the community, resulting in loss of postnatal care and follow up. This project was designed to ensure that women with GDM are followed up in the community postnatally as per the above guidelines.

Methods

A baseline audit was completed at local primary care practice by: (i) enquiring about the local protocols in place for high risk patients, from all partners and practice staff, (ii) searching for any printed forms or tools available in the practice locally and (iii) searching for any online protocols or guidelines at NHS Lanarkshire website. Initial data collection showed there were no set protocols in place for postnatal follow up and screening of these high-risk patients after discharge from secondary care. There were no regular 6 week checks or any annual screening done in the community.

On the basis of the above findings, the following changes were proposed in a practice meeting which were agreed upon by all clinical staff including partners, practice nurse as well as the administrative staff and were implemented in the practice.

- Discharge letters of patients in DOCMAN (software used in primary care for documents handling) with GDM after review by doctors will be redirected to practice nurse's inbox. Practice nurse will add them to annual monitoring register for recalls and also to arrange a FBST around 6 to 8 weeks postnatally.

- At 6-8 week postnatal check, doctor should ensure a FBST is either already performed or booked. All patients must be given diet, weight control and exercise advice and future risks of diabetes explained very clearly.

- A Proforma was introduced with tick box sections to ensure that patients have blood tests arranged and lifestyle advice given when attending for postnatal check.

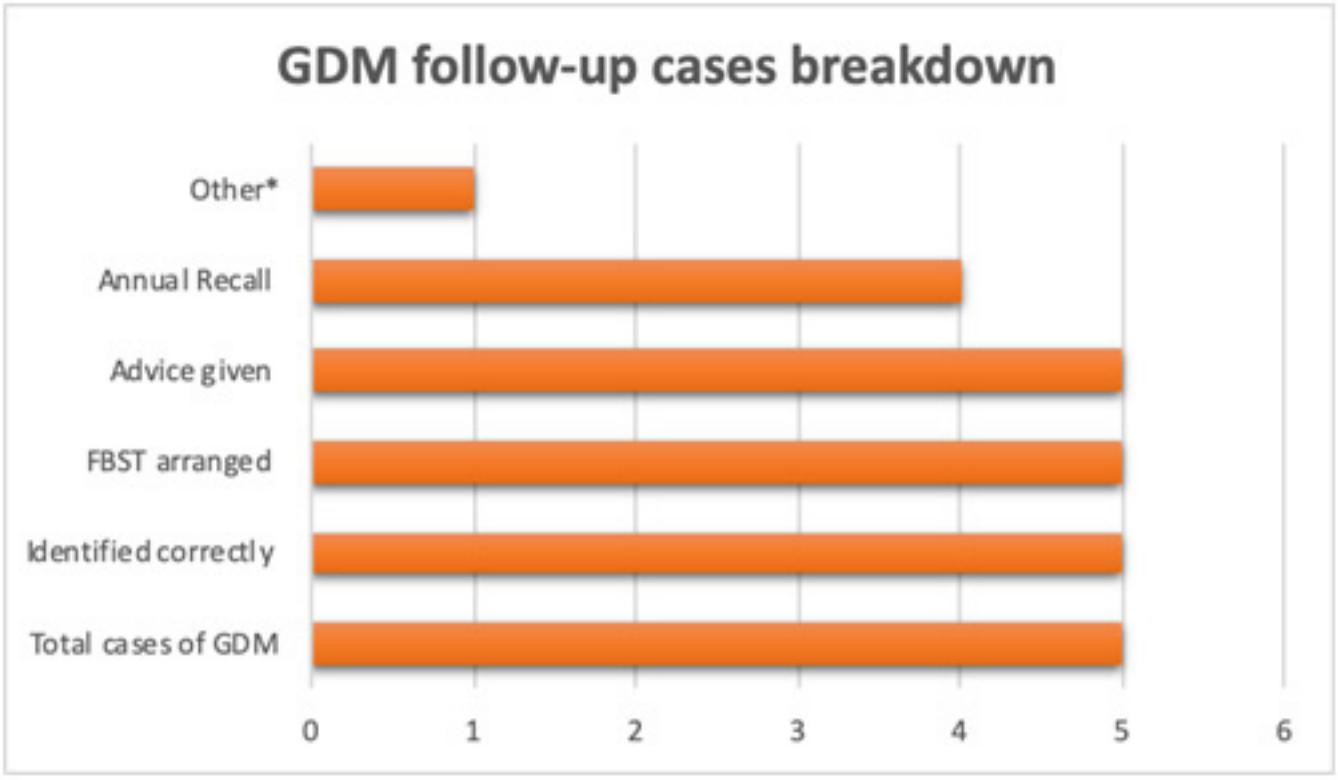
- Finally, these proformas were passed on to practice nurse again before filing in notes, to ensure patients were added to practice register for annual recalls.

- Collect data again after 8 weeks of implementation of changes, as postnatal clinics are held twice a month at the practice, giving results from 4 postnatal clinics. The proformas filed by doctors to be reviewed along with FBST results before final filing in DOCMAN.

Results

Data collection over 2 months showed a total 5 cases of GDM discharged back to primary care (Figure 2 - next page). All cases were identified by doctors on receipt of discharge letters in DOCMAN and were forwarded to practice nurse appropriately. All had 6 week FBST either booked or performed by 6-8 week postnatal check and were advised regarding diet, exercise, weight management, annual screening and their future risk of diabetes. All the proformas were filled in appropriately. Out of five cases, four patients were added onto annual recall register, one patient moved out of Scotland due to family reasons and had no GP enrolment yet at their new place. That patient was given further advice specifically to ensure proper follow-up with a GP locally, highlighting her future risk and annual screening requirements.

Figure 2: Total number of GDM cases identified in the 8 week period and their follow up breakdown. *Others refers to 1 patient who relocated to a different area therefore was unable to offer annual recall.



Discussion

Initial data collection highlighted the flaws in clinical practice related to postnatal care of patients with GDM. The practice had no set standards for such high-risk patients and these women were lost in the community postnatally with no follow ups. Despite extensive research, no local NHS Lanarkshire guidelines or any post-natal screening programs were available for referencing.

NHS Tayside has designed a local guideline, depending on likelihood of ongoing diabetes 6 weeks postpartum (14). Similarly, a very helpful postpartum follow up tool has been designed by American Congress of Obstetricians and Gynaecologists (ACOG) which includes a patient information leaflet and follow-up instructions in a simple manner (15).

On the basis of the above findings, the project proposal was discussed in a practice meeting which was welcomed by the practice staff and their response was very encouraging. The proposed changes were advised and discussed by both clinical and administrative staff and agreed upon together. It was ensured that everyone agreed to change and no one felt overloaded work wise. New proforma with check box was designed, printed and attached with regular 6-8 week postnatal check form. The results have been very positive and encouraging. No issues were identified causing any hindrance in implementation of guidelines in clinical practice.

The main issues which can compromise absolute implementation of these guidelines in future are:

- Frequent changes of clinical staff at practice. This includes new locum doctors, new trainee doctors who may not be aware of guidelines and can miss initial screening of patients while filing their records in DOCMAN.

- Currently, practice has only one nurse practitioner and they being away for longer time periods like sick leave, annual leave etc can compromise arranging FBST by 6-8 week postnatal check.

- Highlighting the future risk of type 2 DM, emphasising on diet, weight control and exercise and minimising the future risk of diabetes needs more sessions, counselling, health promotion, patient involvement and motivation and this cannot all be achieved in one clinic appointment only.

- Another problem encountered was with patients moving off the practice list. These can be missed and need more understanding and insight of their future risk, so they can stay in close contact with their new health care providers.

Conclusion and Recommendations

Although the aims and objectives outlined above have been achieved successfully so far, there are still many gaps in the system which can cause failure of implementation of guidelines in future as mentioned above. First of all, new staff need to be aware of local guidelines and procedures, which can be arranged at induction by giving a printed information pack.

Secondly, there should be some alternative arrangement for 6 week FBST test if the practice nurse is unavailable

due to leave or sickness. This can be done by discussing with the administration staff who can redirect the practice nurse mail to one of the partner's inbox to ensure a FBST is arranged by 6-8 weeks for postnatal check.

Thirdly, these patients need more face to face counselling, dietary input, weight and exercise advice, planning for future pregnancies, more insight and awareness, which simply means they need more regular follow ups in clinic rather than just one tick box counselling session. These patients should ideally be added to regular diabetes recall clinics, once every three months to have closer follow up and optimising their diet and weight control.

Fourthly, those moving out of the area and practice list should be given some printed information to hand to the new practice so the new health care providers are aware of their future risk and can provide care as per local guidelines.

All these factors need to be considered on a long term basis, something which is out of the scope of this project but is very important in providing higher standards of quality care for GDM patients.

References

1. Sign116.pdf [Internet]. [cited 2017 Oct 30]. Available from: http://www.sign.ac.uk/assets/sign116.pdf
2. Gestational diabetes [Internet]. Diabetes UK. [Cited 2017 Oct 30]. Available from: https://www.diabetes.org.uk/diabetes-the-basics/gestational-diabetes
3. Gestational Diabetes [Internet]. [cited 2017 Oct 31]. Available from: http://www.diabetes.co.uk/gestational-diabetes.html
4. January_Supplement_Combined_Final.6-99.pdf [Internet]. [cited 2017 Oct 30]. Available from: http://care.diabetesjournals.org/content/suppl/2014/12/23/38.Supplement_1.DC1/January_Supplement_Combined_Final.6-99.pdf
5. Diabetes in pregnancy: management from preconception to the postnatal period | Guidance and guidelines | NICE [Internet]. [cited 2017 Oct 31]. Available from: https://www.nice.org.uk/guidance/ng3/chapter/Introduction
6. Paterson J. Preventing Type 2 diabetes after gestational diabetes • Gestational Diabetes UK [Internet]. Gestational Diabetes UK. 2016 [cited 2017 Oct 30]. Available from: https://www.gestationaldiabetes.co.uk/preventing-type-2/
7. Diabetes in pregnancy: management from preconception to the postnatal period | Guidance and guidelines | NICE [Internet]. [cited 2017 Oct 30]. Available from: https://www.nice.org.uk/guidance/ng3/chapter/2-research-recommendations#postnatal-treatment-for-women-diagnosed-with-gestational-diabetes
8. Herath H, Herath R, Wickremasinghe R. Gestational diabetes mellitus and risk of type 2 diabetes 10 years after the index pregnancy in Sri Lankan women - A community based retrospective cohort study. PLoS ONE [Internet]. 2017 Jun 23 [cited 2017 Oct 31];12(6). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5482451/
9. Diabetes in pregnancy: management from preconception to the postnatal period | Guidance and guidelines | NICE [Internet]. [cited 2017 Oct 31]. Available from: https://www.nice.org.uk/guidance/ng3/chapter/1-Recommendations#gestational-diabetes-2
10. Diabetes in Pregnancy Burden of Disease. Diabetes in Pregnancy: Epidemiology 2%-10% of pregnancies currently are complicated by gestational diabetes mellitus. - ppt download [Internet]. [cited 2017 Dec 1]. Available from: http://slideplayer.com/slide/6959037/
11. Gestational-diabetes-postpartum-screening.pdf [Internet]. [cited 2017 Nov 28]. Available from: http://guidelines.diabetes.ca/cdacpg/media/documents/patient-resources/gestational-diabetes-postpartum-screening.pdf
12. Women with gestational diabetes missing out on postnatal care [Internet]. Diabetes UK. [cited 2017 Nov 26]. Available from: https://www.diabetes.org.uk/about_us/news_landing_page/women-with-gestational-diabetes-missing-out-on-postnatal-care
13. Collier A, Abraham EC, Armstrong J, Godwin J, Monteath K, Lindsay R. Reported prevalence of gestational diabetes in Scotland: The relationship with obesity, age, socioeconomic status, smoking and macrosomia, and how many are we missing? J Diabetes Investig. 2017 Mar;8(2):161–7.
14. Handbook-__NHS_Tayside_Guideline_for_Post_GDM.pdf [Internet]. [cited 2017 Nov 30]. Available from: http://www.diabeteshealthnet.ac.uk/Documents/Uploaded/Handbook__NHS_Tayside_Guideline_for_Post_GDM.pdf
15. Diabetes-Tear-Pad.pdf [Internet]. [cited 2017 Dec 1]. Available from: https://www.acog.org/-/media/Departments/Public-Health-and-Social-Issues/Diabetes-Tear-Pad.pdf?dmc=1&ts=20171201T0522307553

Relation of thyroid function and gestational hypertension

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Abstract

Background: Gestational hypertension is associated with multiple maternal and fetal complications. This study aimed to find the relation between thyroid function and gestational hypertension.

Methodology: A case control study that included 100 patients, (47) normotensive compared with (53) hypertensive pregnant women.

Results: Most of those with blood group (-O) had hypertension 3(75%), followed by those with blood group (-A) 2(66.7). Mother age was significantly lower among healthy women 28±6, than those who had, mild HT 31.4±6, moderate HT 34.6±6, and severe HT 32.8±3.8.

Increasing parity was significantly associated with gestational HT, 1.5±1.5 for healthy compared with 1.9±1.6, 3.5±2.1, 2.8±1.8 for mild, moderate and severe gestational HT. TSH level was significantly higher 2.8±4, 1.5±0.8, 2.8±2.1 among those who had mild, moderate, and severe HT, as compared with normotensive pregnant ladies 1.7±1.

S. FT3 level 3.7±1.7, 3.3±1.7, 3.1±1.1 was significantly decreased among those with mild, moderate and severe gestational HT respectively compared with normotensive (4.4±1.6).

Conclusion: Gestational hypertension was significantly associated with increased levels of TSH, and decreased FT3 levels, and non-significantly with increased S.FT4.

Key words: gestational hypertension, hypothyroidism. Thyroid dysfunction, preeclampsia

Introduction

In a physiological process like pregnancy, there will be an alteration in different organ systems to supply adequate nutrition to the fetus and these include circulatory, metabolic, and hormonal alterations [1]. In pregnancy there is an increased metabolic need, for which thyroid hormone changes in economy and in hypothalamic - pituitary -thyroid axis regulation [2, 3]. Although there is well-documented knowledge about thyroid functions during normal pregnancy, there is a scant information regarding thyroid functions in complicated pregnancy.[4] Hypertension is one of the pregnancy physiological adaptations that develop various natures of disorders. Gestational hypertension has its onset from 20 weeks of gestation. Regarding clinical presentation may be as the followings; only hypertension (gestational non-proteinuric hypertension) or preeclampsia (hypertension with proteinuria and multiorgan dysfunction); and eclampsia if seizures in addition to preeclampsia there are seizures. [5,6] WHO, and American College of Obstetricians and Gynecologists provided the definition of gestational hypertension that also recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy.[7–9]

Around 10% of all pregnancies complicated by Hypertension that cause an elevated risk of adverse fetal, neonatal and maternal outcomes including prematurity, perinatal death, intrauterine growth restriction, acute hepatic or renal hepatic failure, haemorrhage weather antepartum or postpartum type and maternal death. [10,11] Globally, hypertensive disorders are complicating 5–20% of pregnancies and its incidence differs from 2-8% of pregnancies in developed world reaching more than 10% in developing countries.[9,12] Gestational hypertension is the 3rd leading cause of maternal death globally. In pregnancy, there is an elevated thyroid hormone demand and an elevated iodine uptake and thyroid hormones synthesis. Activity of thyroid gland in normal pregnancy undergoes many changes. [4]There is mild hyperthyroxinemia in normal pregnancy, while in gestational hypertension (GH) females have an elevated incidence of hypothyroidism, (an elevated TSH). [13,14]

According to a lot of reports there is proved that gestational hypertension is found to affect levels of thyroid hormones.[15,16] Normal thyroid hormones pattern during pregnancy is very essential for fetal tissues differentiations. Thyroid hormones pattern may be disorderly affected in hypertensive pregnancy in gestational hypertension.[17,18]

There are a number of adverse outcomes associated with maternal thyroid dysfunction during pregnancy. [19]Increases maternal TSH levels has been associated with an elevated risk of prematurity, abruption of placental, fetal death, and impaired development of neurological system in the child.[15,20] Still there is need to study the thyroid hormone changes specifically that accompanying gestational hypertension have yet to be worked out in Iraqi population. The current study was done to assess thyroid functions in GH, because it will enable to understand and address thyroid crises in GH for still better management.

Patients and method

This research was done in gynecology and obstetrics, Gynecology and Obstetrics Department / Azadi Teaching Hospital after taking permission from Kirkuk health directorate, committee of medical research and Gynecology and Obstetrics Department. The study involve 100 t pregnant women with no history of thyroid disease before and through pregnancy, aged 18–40 years, having diagnosed gestational hypertension, had systolic BP ≥140 mmHg and diastolic BP ≥ 90 mmHg in 3rd trimester of gestation on two occasions at least 6 hour apart. Assessment of gestational age was based on the date of last menstrual period, proved by early pelvic examination, and verified by first trimester or early second-trimester ultrasound. The following cases were excluded from the study; mothers with known history of chronic hypertension, renal disorders, cardiovascular diseases, diabetes, any metabolic disorder that may threat mother or fetus and history of any medication that might affect the thyroid function.

Forty seven (47) normotensive pregnant females were involved as controls compared with 53 pregnant women with gestational hypertension. The blood sample was immediately transferred to plane serum vials and kept for 30 min to clot, and centrifuged at 3,000 rpm for 10 min. The clear serum was pipetted out in three separate 1.5 ml vials. The processed samples were stored at -20 ºC until used for hormone assays. Laboratory work was performed at a proved private laboratory.

Patients from private clinics and hospital admission fulfilling the criteria of inclusion were included in this study after a written informed consent. Detailed history and examination was done. Data was recorded on a questionnaire and analyzed using SPSS-25. The significance of differences between the groups was analyzed by independent t-test and one way ANOVA, and $p<0.05$ was considered statistically significant.

Results

There is no significant relation between mother job and gestational induced hypertension, as shown in Table 1, (P value > 0.05).

Most of the pregnant women with blood group (-O) had hypertension 3(75%), followed by those with blood group (-A) 2(66.7%), this relation was statistically not significant (p value > 0.05), as shown in Table 2.

There is significant increase in BP with increasing age of mother, healthy 28±6, mild HT 31.4±6, moderate HT 34.6±6, severe HT 32.8±3.8. Increasing gravidity also

Table 1. The relation between mother job and gestational induced hypertension

Job	Blood Pressure				Total
	Normal	Mild Hypertension	Moderate Hypertension	Severe Hypertension	
House Wife	41	13	17	15	86
	47.7%	15.1%	19.8%	17.4%	100.0%
Employed	6	3	3	2	14
	42.9%	21.4%	21.4%	14.3%	100.0%
Total	47	16	20	17	100
	47.0%	16.0%	20.0%	17.0%	100.0%

*X*2= 0.44, df=3, P value=0.93 (not significant)

Table 2: The relation between mother blood group and gestational induced hypertension

		Blood Pressure				Total
		Normal BP	Mild Hypertension	Moderate Hypertension	Severe Hypertension	
Blood Group	A+	11	4	7	8	30
		36.7%	13.3%	23.3%	26.7%	100.0%
	B+	11	5	1	1	18
		61.1%	27.8%	5.6%	5.6%	100.0%
	AB+	6	2	1	0	9
		66.7%	22.2%	11.1%	0.0%	100.0%
	O+	15	4	7	6	32
		46.9%	12.5%	21.9%	18.8%	100.0%
	A-	1	0	0	2	3
		33.3%	0.0%	0.0%	66.7%	100.0%
	B-	1	1	0	0	2
		50.0%	50.0%	0.0%	0.0%	100.0%
	AB-	1	0	1	0	2
		50.0%	0.0%	50.0%	0.0%	100.0%
	O-	1	0	3	0	4
		25.0%	0.0%	75.0%	0.0%	100.0%
Total		47	16	20	17	100
		47.0%	16.0%	20.0%	17.0%	100.0%

*X*2= 28.5, df=21, P value=0.126 (not significant)

Table 3: The relation of clinical and biochemical characteristic with gestational hypertension

	Normal Blood Pressure		Mild Hypertension		Moderate Hypertension		Severe Hypertension		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	ANOVA
Age in years	28.0	6.0	31.4	6.0	34.6	6.0	32.8	3.8	0.000*
Gestational Age of Pregnancy/weeks	35.0	3.8	33.8	3.3	33.8	4.3	34.4	4.0	0.618
Gravida	2.7	1.6	2.9	1.6	5.2	2.7	4.3	1.8	0.000*
Parity	1.5	1.5	1.9	1.6	3.5	2.1	2.8	1.8	0.000*
Abortion	0.2	0.7	0.3	0.6	0.7	1.1	0.5	1.2	0.204
TSH Mic International Unit / mL	1.7	1.0	2.8	4.0	1.5	0.8	2.8	2.1	0.047*
FT3 ng/dL	4.4	1.6	3.7	1.7	3.3	1.7	3.1	1.1	0.015*
FT4 ng/dL	11.9	2.05	11.7	1.6	12.8	3.3	12.5	2.3	0.373

*significant

significantly associated with gestational HT, 2.7±1.6 for healthy compared with 2.9±1.6, 5.2±2.7, 4.3±1.8 for mild, moderate and severe gestational HT, this relation was statistically significant as shown in table (3). Increasing parity was significantly associated with gestational HT, 1.5±1.5 for healthy compared with 1.9±1.6, 3.5±2.1, 2.8±1.8 for mild, moderate and severe gestational HT, this relation was statistically significant. Increasing TSH level was associated with gestational HT significantly, as compared with normotensive pregnant ladies 1.7±1 for healthy compared with 2.8±4, 1.5±0.8, 2.8±2.1 for mild. Decreased S. FT3 level associated significantly with gestational HT, 4.4±1.6 for healthy compared with 3.7±1.7, 3.3±1.7, 3.1±1.1 for mild, moderate and severe gestational HT, this relation was statistically significant, as shown in Table 3.

Discussion

Overt or subclinical thyroid dysfunction is associated with miscarriage, gestational hypertension, placental abruption, postpartum hemorrhage anemia and increased fetal morbidity and mortality. [21, 22, 23]

In this study there was significant difference in age of study groups, the hypertensive group older than the normotensive group. This goes with what find previously by Abdulslam K. and Yahaya IA, who found significantly increased mother age among those with gestational hypertension. [24]

Increasing TSH level was significantly higher among mothers with gestational Hypertension, as compared with normotensive pregnant ladies 1.7±1 for healthy compared with 2.8±4, 1.5±0.8, 2.8±2.1 for mild. This goes with a study In India done by Pasupathi P. et al found a significant increase in S.TSH level among preeclampsia pregnant women 5.24 ± 2.58 compared to normal pregnant women 3.89 ± 2.32 .[25]

In Nigeria Abdulslam K. and Yahaya IA also found a significant increase in TSH among hypertensive group 2.1 ± 1.7 as compared with normotensive group 1.6±1. [15] Saki F. and et al in Iran found that 75% of the pregnant women with hypothyroidism (clinical or sub-clinical hypothyroidism) had preeclampsia. [26]

Decreased S. FT3 level associated significantly with gestational HT, healthy pregnant women mean S.FT3 was 4.4±1.6 compared with 3.7±1.7, 3.3±1.7, 3.1±1.1 for mild, moderate and sever gestational HT. this finding supported by previous studies, Pasupathi P. et al 3.57 ± 1.21 normotensive pregnant, 2.72 ± 1.15for preeclampsia women was significantly lower in preeclampsia than in normally pregnant women.[25]

In Nigeria reported non- significant decrease from 6.9±2.6 among normotensive to 6.4±2.7 among hypertensive group.[24]

Pasupathi P. et al found that FT4 was non significantly higher among preeclampsia women 2.42 ± 0.75 than normal pregnant 2.38 ± 0.99.[25]

Reduced extra-thyroidal conversion of T4 to T3 may be the cause of the higher T4 levels and lower T3 levels in preeclampsia.[25]

Johns L E and et al found that FT4 was inversely associated with fetal weight and growth, [27] gestational hyper tension associated with decreased fetal growth and weight, therefore we are in need of research to know the

relation between the gestational hypertension fetal growth and FT4 level.

Preeclampsia is pregnancy-induced autointoxication with multisystem disorders; the most affected organs are brain, liver, and kidneys. Functional disorders in these organ systems are evident in preeclampsia [13] However, the liver and kidneys are the most important organs in peripheral deiodination (conversion of T4 to T3) and in the maintenance of normal blood levels of T4 and T3. This is why involvement of liver and kidneys in preeclampsia is likely to change serum T4 and T3 levels. In some other studies, investigators have observed that preeclamptic women may affected by a variety of conditions. These include systemic illnesses, protein-energy malnutrition, starvation, anorexia nervosa, Cushing's syndrome, and excessive steroid therapy. When the women have developed such systemic disorders, the extra-thyroidal deiodination of T4 to T3 has been reduced. Due to wide range of normal limits, however, the differences in T4 and T3 usually neither exceed normal limits nor produce significant metabolic changes. [28]

In previous studies an association between hypothyroidism and preeclampsia was found, hypothyroidism may be the cause of reversible hypertension in the pregnant and non-pregnant population. [29,30] Hypothyroidism can cause vascular smooth muscle contraction both in systemic and renal vessels, which leads to increased diastolic hypertension, peripheral vascular resistance, and decreased tissue perfusion. [30, 31]

In rare cases, proteinuria may be severe enough to cause thyroxine and thyroid binding globulin loss in a way that couldn't be compensated by the body, resulting in thyroid dysfunction. [32, 33]

Conclusion

Gestational hypertension was associated with increased levels of TSH, and decreased FT3 levels significantly, while FT4 was none significantly increased, even though it stile within border normal ranges.

References

1. Kumar A, Ghosh BK, Murthy NS. Maternal thyroid hormonal status in preeclampsia. Indian J Med Sci 2005; 59:57–63.
2. Van Raaij JM, Vermaat-Miedema SH, Schonk CM, Peek ME, Hautvast JG. Energy requirements of pregnancy in The Netherlands. Lancet 1987; 2:953–5.
3. Glinoer D. The regulation of thyroid function in pregnancy: pathways of endocrine adaptation from physiology to pathology. Endocr Rev 1997; 18:404–33.
4. Brent GA. Maternal thyroid function: interpretation of thyroid function tests in pregnancy. Clin Obstet Gynecol 1997; 40:3–15.
5. Brown MA, Lindheimer MD, de Swiet M, Van Assche A, Moutquin JM. The classification and diagnosis of the hypertensive disorders of pregnancy: statement from the International Society for the Study of Hypertension in Pregnancy (ISSHP). Hypertens Pregnancy 2001; 20:9–14.
6. Brown MA, Hague WM, Higgins J, Lowe S, McCowan L, Oats J, et al. The detection, investigation and management of hypertension in pregnancy. Aust N Z J Obstet Gynaecol 2000;40:139–55.
7. World Health Organization. Global Program to Conquer preeclampsia/Eclampsia 2002.
8. ACOG Committee on Practice Bulletins–Obstetrics. ACOG practice bulletin. Diagnosis and management of preeclampsia and eclampsia. Obstet Gynecol 2002; 33(99):159–67.
9. Report of the national high blood pressure education program working group on high blood pressure in pregnancy. Am J Obstet Gynecol 2000; 183:S1–S22
10. Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol 2009; 33:130–7.
11. Steegers EA, von Dadelszen P, Duvekot JJ, Pijnenborg R. Preeclampsia. Lancet 2010; 376:631–44.
12. Krauss T, Kuhn W, Lakoma C, Augustin HG. Circulating endothelial adhesion molecules as diagnostic markers for the early identification of pregnant women at risk for development of preeclampsia. Am J Obstet Gynecol 1997; 177:443-9.
13. Qublan HS, Al-Kaisi IJ, Hindawi IM, Hiasat MS, Awamleh I, Hamaideh AH, et al. Severe preeclampsia and maternal thyroid function. J Obstet Gynaecol 2003;23:244–6.
14. Kaya E, Sahin Y, Ozkececi Z, Pasaoglu H. Relation between birth weight and thyroid function in preelampsia-eclampsia. Gynaecol Obstet Invest 1994;37:30–3.
15. Casey B, Leveno K. Thyroid disease in pregnancy. Obstet Gynecol 2006; 108:1283–92.
16. Dhananjaya BS, et al. Thyroid Stimulating Hormone (TSH) Levelas a Possible Indicator of Pre-eclampsia. J Clin Diagn Res 2011;5:1542–3.
17. Hotelling DR, Sherwood LM. The effects of pregnancy on circulating triiodothyronine. J Clin Endocrinol 1971;33:783–6.
18. Dhingra S, Owen PJ, Lazarus JH, Amin P Resistanceto thyroid hormone in pregnancy. Obstet Gynecol2008;112(2 Pt 2):501-3.
19. Glinoer D. The systematic screening and management of hypothyroidism and hyperthyroidism during pregnancy. Trends Endocrinal Metab 1998;9:403–11.
20. Asmehan A, Al- Naqeeb. Correlation betweenThyroid-related Hormones and Preeclampsia. Iraqi Sci. J Nurs 2010; 23:76–80.
21. . Reid SM, Middleton P, Cossich MV, et al. Interventions for clinical and subclinical hypothyroidism in pregnancy. Cochrane database of Systemic rev. 2010;(7):CD007752.
22. Sahu MT, Das V, Mittal S, et al. Overt and subclinical thyroid dysfunction among Indian pregnant women and its effect on maternal and fetal outcome. Arch Gynecol Obstet. 2010;281(2):215–220.
23. Stagnaro-Green A. Overt hyperthyroidism and Hypothyroidism during pregnancy. Clin obstet Gynecol. 2011; 54(3):478–487.

24. Abdulslam K, Yahaya IA. Prevalence of thyroid dysfunction in gestational hypertensive Nigerians. Sub-Saharan Afr J Med 2015; 2:19-27.
25. Pasupathi P, Deepa M, Rani P., Vidhya Sankar K.B., and Satish kumar S.P. Evaluation of Serum Lipids and Thyroid Hormone Changes in Non-Pregnant, Pregnant, and Preeclampsia Women. Thyroid Science CLS 2009; 4(10): 1-6.
26. Saki F., Dabbaghmanesh MH, Ghaemi S Z, Forouhari S, Omrani G R, Bakhshayeshkaram M. Thyroid Function in Pregnancy and Its Influences on Maternal and Fetal Outcomes. Int J Endocrinol Metab. 2014; 12(4): e19378.
27. Johns L E., Ferguson K K., Cantonwine D E., Mukherjee B, Meeker J D., and McElrath T F.Subclinical Changes in Maternal Thyroid Function Parameters in Pregnancy and Fetal Growth. J Clin Endocrinol Metab, 2018, 103(4):1349–1358
28. Larijani, B., Marsoosi, V., Aghakhani, S., Moradi, A and Hashemipour, S.: Thyroid hormone alteration in pre-eclamptic women. Gynecol. Endocrinol., 18(2),97-100, 2004.
29. S. Stabouli, S. Papakatsika, and V. Kotsis, "Hypothyroidism and hypertension," Expert Review of Cardiovascular Therapy 2010; 8(11):1559–1565.
30. R. Negro and J. H. Mestman, "Thyroid disease in pregnancy," Best Practice & Research: Clinical Endocrinology & Metabolism 2011; 25 (6): 927–943.
31. A. Alfadda and M. Tamilia, "Preeclampsia-like syndrome that is associated with severe hypothyroidism in a 20-week pregnant woman," American Journal of Obstetrics and Gynecology2004;191(5): 1723–1724.
32. R. Gilles et al., "Thyroid function in patients with proteinuria," Netherlands Journal of Medicine 2008;66 (11): 483–485.
33. V. Chandurkar, J. Shik, and E. Randell, "Exacerbation of underlying hypothyroidism caused by proteinuria and induction of urinary thyroxine loss: case report and subsequent investigation," Endocrine Practice 2008; 14 (1): 97–103.
34. Inversetti A, Serafini A, Manzoni MF, Dolcetta Capuzzo A, Valsecchi L, Candiani M. Severe hypothyroidism causing pre-eclampsia-like syndrome. Case Rep Endocrinol. 2012; 2012:586056. doi:10.1155/2012/586056

Role of Health Literacy and Motivational Interviewing in Building Insight for Self-management of Diabetes Mellitus

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Abstract

Background: Health literacy in simple words is defined as the "degree to which an individual can obtain, understand, process and apply the basic health information, required to make appropriate health decisions". Health literacy is an independent, but a very powerful predictor of health status and behaviour moreso than race and education. Poor health literacy is associated with poor self-care, increased disease incidence, poor use of resources and health services and negative impacts on health. Health literacy is as important for clinicians as it is for patients as it helps to bridge the gap between the health information provided and its practical implementation. For this we need health care professionals who can speak the language of their patients and understand their culture. Common reasons for poor health literacy are ethnic, racial, geographical and age-related factors. Working as a primary care physician entails a huge responsibility for educating people and increasing health access and supporting self-management in the community.

Methods: A prospective study was carried out on 10 patients with type 2 diabetes mellitus (T2DM), registered at a local primary health care practice in South Lanarkshire, Scotland, UK to see if motivational interviewing (MI) and improving health literacy can help in building insight into self-management of chronic conditions like T2DM. The study was conducted over 4 a month period with regular patient feedback after each visit.

Results: As per patient feedback, the results were positive and encouraging. All patients felt they had a better understanding and insight into management of their T2DM than before and were more engaged and involved towards self-management of diabetes.

Conclusion: Health is complex and requires proper understanding, motivation and skills. Doctors need good communication skills to be able to share the complex medical information in a clear manageable way, which should be tailored according to individual patient needs and skills. People can be very literate but still can have low health literacy so as primary care physicians we have responsibility to communicate in ways that enable people to make informed choices about their own health.

Key words: health literacy, diabetes mellitus, motivation

Introduction

Diabetes is a common metabolic condition world-wide. In the UK, there are an estimated 4.5 million people affected by diabetes including both type 1 and type 2. Around 3.5 million have been diagnosed with diabetes and 1 million still do not know they are affected by it as they have not been diagnosed yet(1)(2). This represents around 6% of the UK population or in other words 1 in every 16 people in the UK have diabetes both diagnosed and undiagnosed. Diabetes prevalence in the UK will rise to 5 million by the year 2025(2)(3).

T2DM is growing very fast world-wide and now is the world's most common chronic health condition. There is an increase in prevalence in T2DM among young people with an accelerated course of diabetes related complications among the young population(4). Management of diabetes requires extensive self-care and diabetes education and better understanding is effective in improving self-management behaviours(5). Limited understanding and poor health literacy are associated with poor diabetes outcomes as people often have worse diabetes knowledge. Self-management is the cornerstone of diabetes care and those affected by diabetes need to perform multiple self-management activities on a day to day basis to prevent long term complications and adverse outcomes(6)(7).

Literacy in simple words means to read, write, understand and speak a language. Health literacy is a measure of patients' ability to read, understand, comprehend and act on medical instructions given for medical conditions and ailments. Common reasons for poor health literacy are ethnic, racial, geographical and age-related factors. Inadequate health literacy leads to increased burden of disease related problems among disadvantaged populations causing poor self-rated health and higher use of services(8)(9). Lower health literacy rate is common in people with diabetes and is associated with poor glycaemic control, lower self-care activities, less knowledge of diabetes, poor communication with health care professionals and lower self-efficacy. Because of this health literacy is rising as a crucial issue world-wide and is considered an important determinant of health outcomes in people with diabetes(10). Health literacy is built around the idea that both health and literacy are necessary and vital for everyday living. It is a complex system involving individuals, families, communities and health systems. Within this complex system are patients, health care professionals, consumers and lay people(9).

For doctors and other health professionals, delivering health literacy offers many challenges which include different learning styles, levels of communication, acknowledgement and support for people with low health literacy as well as with high health literacy. From the patients' perspective, health literacy is understanding and using the wide range of options and information relevant to their condition, understanding medical terms and jargon, developing and adoption of skills to manage their own health within the context of their work, family and community life(11).

Unfortunately, most of the management of diabetes happens only in outpatient clinics and the information provided to patients is poorly taken and understood by patients and does not involve their individual life circumstances and values(6)(12). Other common approaches provided to patients for self-management include telephone counselling(13)(14), group visits and education(15) and online based programs(6)(14).

T2DM is a lifelong disease and requires special emphasis on diet to control disease, reduce symptoms and minimise complications(16)(17). Regulating the dietary pattern is the main treatment for patients with T2DM. This is associated with better glycaemic control, lipid regulation and body weight control(18). Intensive education about nutrition has excellent effects on controlling blood sugar levels in late middle-aged adults with type 2 diabetes. Nutritional education cultivates better dietary habits and increases physical activity which play an important role in patients with diabetes. Intensive education about nutrition is effective in better diabetes control in a 30-day period(19).

Motivational interviewing (MI) is a psychotherapeutic approach which helps to move a person away from a state of uncertainty and indecision towards motivation to help them make positive decisions and achieve better targets and accomplish established goals. MI works on facilitating and encouraging internal motivation to bring changes in behaviour. It has recently become an area of great interest in the diabetes behaviour field(20). MI is an effective way to improve diabetes self-management outcomes, quality of life outcomes and self-efficacy outcomes(21). A study done in African American women with diabetes over a period of two years showed diabetes related clinical and dietary self-care outcomes were improved following MI intervention and motivation played an important part in self-care management(22). The effects of MI on T2DM outcomes showed promising results in view of dietary behaviours and were most favourable for weight management as well(23).

Materials and Methods

Study Design:
A prospective study was carried out aiming at delivering dietary advice and health education to patients with T2DM, to enhance and promote their understanding of the condition and to try to introduce a positive health behaviour change, leading to improved self-management of diabetes through motivational interviewing. This was accomplished through building insight and strengthening personal motivation and commitment towards diabetes self-management. The long-term benefits would be promoting a patient centred approach leading to better outcomes in chronic disease management, something that will evolve over a longer time period and cannot be demonstrated within the limited time frame of this project.

Secondly, this project also involved getting critical feedback and analysis from patients over the whole process; how did they feel about it and if the process made any changes

in their understanding and approach towards their chronic condition which would help them in achieving better outcomes and results in the long term.

Study Population:
Ten patients with T2DM registered at a local primary health care practice in South Lanarkshire, Scotland, UK, were selected. Patients were chosen with specific selection criteria from the annual diabetes review clinic. The selection criteria were,

1. All patients had a confirmed diagnosis of T2DM.
2. All were taking oral hypoglycaemic agents for at least one year or more. Patients on combination of injectables (Insulin or GLP-1 analogues) with oral hypoglycaemic were excluded in order to keep the study simple.
3. Patients had their HbA1c done recently in the last couple of weeks and were scheduled to re-attend the diabetic clinic for their annual reviews.
4. Blood results showed a rise in HbA1c levels as compared to previous results, in last one year despite being on oral hypoglycaemic agents regularly for at least one year.
5. Those who identified their diet as the main reason behind HbA1c rise and could be improved and were willing to discuss it further. These were the patients who identified some potential areas in their diet that could be addressed and improved.

From all those patients who attended for their annual diabetes review, ten patients were selected who met all above inclusion criteria and were followed up over a period of 4 months, i.e from March 2017 to July 2017.

Study Method:
All the patients booked for annual diabetic review clinic had their recent blood results sent in post a week before their attendance to prepare their questions and to discuss their blood results, diet and diabetes control in detail. Each patient was allocated a twenty minute appointment slot to discuss their results and future strategy in detail. Patients were given the chance to discuss their difficulties with self-management of diabetes, diet wise. Special emphasis was given to dietary and lifestyle changes. Patients were assessed for their preferred learning styles and were educated accordingly.

Study Instrument:
Different educational platforms were used according to individual learning preferences and styles. The learning styles were identified by asking patients about their own preferred method. Different platforms used were,

1- Online resources, three common ones www.diabetes.org.uk , www.diabetes.co.uk & www.diabetes.ca (DASH Diet Plan).
2- Patient information leaflets printed either from online resources(24)(25) or using local NHS Lanarkshire information leaflet(26).
3- Online videos including YouTube (http://www.diabetes.co.uk/diet/nhs-diet-advice.html) (25).
4- Open option to call back the physician and discuss, if required, any advice or input.
5- Option to be referred to community-based diabetes specialist dieticians if patient believed they would need more detailed, regular and closer follow ups with dieticians in the community.
6- NHS Lanarkshire offers a STEP program (https://www.nhslanarkshire.scot.nhs.uk/services/diabetes/), which is a three week long structured interactive program, patients can self-refer and can bring a friend or family member as well (27)(28)(29).

Patients were advised to return for further consultations every three to four weeks with a list of questions they had made from previous consultations and the resources they had used in between. This was to help them further in clearing any doubts and promote a better understanding on regular basis. Multiple consultations were done during a 4 month study period, depending on individual patient' needs and requirements. At the end of each consultation, patients were asked to fill out two different types of feedback forms so that regular feedback could be obtained to enhance and restructure the future consultations accordingly.

First, Care Measure Tool (Appendix-1) was used, providing feedback about the consultations, learning, things they found best and least helpful and what they would like to change for next time. Second, Change-Plan Worksheet (Appendix-2) was used to get an assessment, if a successful health behaviour change was introduced and if the patients felt more motivated in self-management of their diabetes. Reasons for the feedback were,
1- To get a critical analysis of the consultations from patients. If a patient centred approach was applied and if the patients felt their concerns were addressed appropriately and to self-analyse and evaluate their own learning needs and methods.
2- To analyse if the concepts and principles of motivational interview in improving health literacy were applied appropriately in a professional context.
3- If a positive behavioural change was successfully introduced and if the patients felt more motivated to work on their diet for improvements in blood sugar and HbA1c levels.

Ethical Considerations:
Researchers obtained ethical approval as per the local NHS policy. Patients written and signed consents were taken.

Results

Overall results were very good and encouraging. The feedback received from the patients was positive. The Care Measure Tool (Appendix-1) had six areas for marking starting from Poor all the way up to Excellent and then Does Not Apply. Patients felt they were at ease, had a good chance to discuss their issues, as evident from their feedback. They felt they were given a good chance to speak and get involved. Patients also liked the idea of being offered the option to call back and discuss things

over the phone if needed, although none of them made any phone calls in between the clinic consultations over 4 months period. Patients felt that an agreed management plan was made according to their individual needs, work and family commitments. All marked Excellent in domain 3 (Really listening) on the Care Measure Tool. None of them marked Poor, Fair or Does Not Apply at all. All domains were marked between Good to Excellent. All patients agreed to attend the clinic on a regular basis between 2 to 4 weeks to monitor further progress.

Results from Change-Plan Worksheet (Appendix-2) were again very encouraging. Patients expressed the changes they wanted to bring to their diet and lifestyle, reasons behind those changes and how they were planning to achieve them. This again showed their positive attitude, encouragement and more involvement towards self-management of diabetes, which was another aim of this project. They were more aware of different support options available. This indicated that patients were in the process of initiating positive behavioural change towards management of their long-term condition but whether these changes would sustain in the future for a long period could not be defined within the limited time frame of the project.

Discussion

Building insight to strengthen personal motivation and commitment towards diabetes self-management could be achieved through a series of hard work. After various consultations over the period of 4 months, it was evident that all patients felt more motivated and encouraged towards the self-care and management of their T2DM. They were more aware of local options and resources available and had better choices to make. It was proven that increasing health literacy through motivational interviewing and promoting better understanding leads to better patient involvement in management of long-term conditions giving better results and outcomes, something which was out of the limited scope of this project to calculate but can be monitored with further future studies. This of course requires a long-term contact between the patient and health care professional, building rapport, assessing individual patients for their own learning styles and methods depending on their background, and their literacy rates and then adopting accordingly, delivering information accordingly and keep on following regularly, going through different episodes of motivational interviewing with regular follow up and feedback to ensure that there was better patient understanding of their condition. Initiation of change ideally should continue in the right direction and sustain for the long term for better results and outcomes. The idea of encouraging patients and educating about self-management of diabetes is not straight forward but does has its positive implications and advantages.

Usually, the common barriers and obstacles faced in delivering health education are appointment time restrictions, loss of continuity of care by not seeing the same physician at every visit and changing health centres on a frequent basis. We need to realise that as health care professionals we see patients in a limited time period (10-20 minutes usually) during which we have to build a quick rapport and relationship, find out patients own understanding of the condition, find out their ideas, concerns and expectations (famous ICE), find out their priorities, the physical and psychological impact the disease has on their daily life, come up with a shared and agreed management plan that suits their needs and they are willing to engage in and ensuring that they are happy with the plan and will be willing to come back and see the same health care professional in future to maintain the continuity of care.

References

1. Diabetes Prevalence 2016 (November 2016) - Diabetes UK [Internet]. [cited 2017 May 28]. Available from: https://www.diabetes.org.uk/Professionals/Position-statements-reports/Statistics/Diabetes-prevalence-2016/
2. How Many People Have Diabetes - Diabetes Prevalence Numbers [Internet]. [cited 2017 May 28]. Available from: http://www.diabetes.co.uk/diabetes-prevalence.html
3. Taylor R. Diabetes: UK Prevalence and Policy Developments. 2016 Feb 3 [cited 2017 Jul 24]; Available from: http://researchbriefings.parliament.uk/ResearchBriefing/Summary/LIF-2016-0012
4. Bain SC, Feher M, Russell-Jones D, Khunti K. Management of type 2 diabetes: the current situation and key opportunities to improve care in the UK. Diabetes Obes Metab. 2016 Dec 1;18(12):1157–66.
5. Kim S, Love F, Quistberg DA, Shea JA. Association of Health Literacy With Self-Management Behavior in Patients With Diabetes. Diabetes Care. 2004 Dec 1;27(12):2980–2.
6. Sarkar U, Piette JD, Gonzales R, Lessler D, Chew LD, Reilly B, et al. Preferences for self-management support: Findings from a survey of diabetes patients in safety-net health systems. Patient Educ Couns. 2008 Jan;70(1):102–10.
7. Fisher EB, Brownson CA, O'Toole ML, Shetty G, Anwuri VV, Glasgow RE. Ecological Approaches to Self-Management: The Case of Diabetes. Am J Public Health. 2005 Sep 1;95(9):1523–35.
8. Schillinger D, Grumbach K, Piette J, Wang F, Osmond D, Daher C, et al. Association of Health Literacy With Diabetes Outcomes. JAMA. 2002 Jul 24;288(4):475–82.
9. Track1_Inner.pdf [Internet]. [cited 2017 Jun 3]. Available from: http://www.who.int/healthpromotion/conferences/7gchp/Track1_Inner.pdf
10. Lee E-H, Kim C-J, Lee J, Moon SH. Self-administered health literacy instruments for people with diabetes: systematic review of measurement properties. J Adv Nurs. 2017 Feb 1;n/a-n/a.
11. RCGP-Health-Literacy-2014.pdf [Internet]. Available from: http://www.rcgp.org.uk/clinical-and-research/a-to-z-clinical-resources/health-literacy-report.aspx
12. Schillinger D, Bindman A, Wang F, Stewart A, Piette J. Functional health literacy and the quality of physician–patient communication among diabetes patients. Patient

Educ Couns. 2004 Mar;52(3):315–23.
13. Piette JD, Weinberger M, Kraemer FB, McPhee SJ. Impact of Automated Calls With Nurse Follow-Up on Diabetes Treatment Outcomes in a Department of Veterans Affairs Health Care System. Diabetes Care. 2001 Feb 1;24(2):202–8.
14. Glasgow RE, Bull SS. Making a Difference With Interactive Technology: Considerations in Using and Evaluating Computerized Aids for Diabetes Self-Management Education. Diabetes Spectr. 2001 Apr 1;14(2):99–106.
15. Clancy DE, Cope DW, Magruder KM, Huang P, Salter KH, Fields AW. Evaluating Group Visits in an Uninsured or Inadequately Insured Patient Population With Uncontrolled Type 2 Diabetes. Diabetes Educ. 2003 Mar 1;29(2):292–302.
16. Sami W, Ansari T, Butt NS, Hamid MRA. Effect of diet on type 2 diabetes mellitus: A review. Int J Health Sci. 2017;11(2):65–71.
17. 18560024.pdf [Internet]. [cited 2017 Jun 4]. Available from: http://www.inaactamedica.org/archives/2008/18560024.pdf
18. Effects of Dietary Pattern and Education on Glycemic Control in Patients with Type 2 Diabetes Mellitus .pdf [Internet]. [cited 2017 Jun 4]. Available from: http://www.inaactamedica.org/archives/2008/18560024.pdf
19. Li Y, Xu M, Fan R, Ma X, Gu J, Cai X, et al. The Effects of Intensive Nutrition Education on Late Middle-Aged Adults with Type 2 Diabetes. Int J Environ Res Public Health [Internet]. 2016 Sep;13(9). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5036730/
20. Welch G, Rose G, Ernst D. Motivational Interviewing and Diabetes: What Is It, How Is It Used, and Does It Work? Diabetes Spectr. 2006 Jan 1;19(1):5–11.
21. Chen SM, Creedy D, Lin H-S, Wollin J. Effects of motivational interviewing intervention on self-management, psychological and glycemic outcomes in type 2 diabetes: A randomized controlled trial. Int J Nurs Stud. 2012 Jun 1;49(6):637–44.
22. Miller ST, Akohoue SA. Two-year follow-up study of a group-based diabetes medical nutrition therapy and motivational interviewing intervention among African American women [Internet]. Patient Related Outcome Measures. 2017 [cited 2017 Jun 21]. Available from: https://www.dovepress.com/two-year-follow-up-study-of-a-group-based-diabetes-medical-nutrition-t-peer-reviewed-fulltext-article-PROM
23. Ekong G, Kavookjian J. Motivational interviewing and outcomes in adults with type 2 diabetes: A systematic review. Patient Educ Couns. 2016 Jun 1;99(6):944–52.
24. What is a healthy, balanced diet for diabetes? - Diabetes UK [Internet]. [cited 2017 Jun 18]. Available from: https://www.diabetes.org.uk/Guide-to-diabetes/Enjoy-food/Eating-with-diabetes/What-is-a-healthy-balanced-diet/
25. NHS Diet Advice for Diabetes [Internet]. [cited 2017 Jun 18]. Available from: http://www.diabetes.co.uk/diet/nhs-diet-advice.html
26. Diabetes - Healthy eating and your Diabetes.pdf [Internet]. [cited 2017 Jun 18]. Available from: http://www.nhslanarkshire.org.uk/Services/Diabetes/Documents/Diabetes%20-%20Healthy%20eating%20and%20your%20Diabetes.pdf
27. [cited 2017 Jun 18]. Available from: http://www.nhslanarkshire.org.uk/Services/Diabetes/Education/Pages/STEP.aspx
28. STEP Leaflet v2 updated June16.pdf [Internet]. [cited 2017 Jun 18]. Available from: http://www.nhslanarkshire.org.uk/Services/Diabetes/Education/Documents/STEP%20Leaflet%20v2%20updated%20June16.pdf
29. STEP POSTER June 2016.pdf [Internet]. [cited 2017 Jun 18]. Available from: http://www.nhslanarkshire.org.uk/Services/Diabetes/Education/Documents/STEP%20POSTER%20June%202016.pdf

Appendix 1: Taken from http://www.caremeasure.org/CAREEng.pdf

CARE Patient Feedback Measure for

*** Type name of Practitioner here ***

Please write today's date here:

D D / M M / Y Y

Please rate the following statements about today's consultation.

Please mark the box like this ☑ with a ball point pen. If you change your mind just cross out your old response and make your new choice. Please answer every statement.

How good was the practitioner at...	Poor	Fair	Good	Very Good	Excellent	Does not apply
1) Making you feel at ease (introducing him/herself, explaining his/her position, being friendly and warm towards you, treating you with respect; not cold or abrupt)	☐	☐	☐	☐	☐	☐
2) Letting you tell your "story" (giving you time to fully describe your condition in your own words; not interrupting, rushing or diverting you)	☐	☐	☐	☐	☐	☐
3) Really listening (paying close attention to what you were saying; not looking at the notes or computer as you were talking)	☐	☐	☐	☐	☐	☐
4) Being interested in you as a whole person (asking/knowing relevant details about your life, your situation; not treating you as "just a number")	☐	☐	☐	☐	☐	☐
5) Fully understanding your concerns (communicating that he/she had accurately understood your concerns and anxieties; not overlooking or dismissing anything)	☐	☐	☐	☐	☐	☐
6) Showing care and compassion (seeming genuinely concerned, connecting with you on a human level; not being indifferent or "detached")	☐	☐	☐	☐	☐	☐
7) Being positive (having a positive approach and a positive attitude; being honest but not negative about your problems)	☐	☐	☐	☐	☐	☐
8) Explaining things clearly (fully answering your questions; explaining clearly, giving you adequate information ; not being vague)	☐	☐	☐	☐	☐	☐
9) Helping you to take control (exploring with you what you can do to improve you health yourself; encouraging rather than "lecturing" you)	☐	☐	☐	☐	☐	☐
10) Making a plan of action with you (discussing the options, involving you in decisions as much as you want to be involved; not ignoring your views)	☐	☐	☐	☐	☐	☐

Comments: If you would like to add further comments on this consultation, please do so here.

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Appendix 2

Change-Plan Worksheet

Changes I want to make:	
How important is it to me to make these changes? (1-10 scale)	
How confident am I that I can make these changes? (1-10 scale)	
The most important reasons I want to make these changes are:	
The steps I plan to take in changing are:	
How other people can help me:	
Person	**Kind of help**
I will know my plan is working when:	
Some things that could interfere with my plan are:	

Taken from https://smartrecovery.org/wp-content/uploads/2017/03/Change_Plan_Worksheet-1.pdf

Spontaneous uterine rupture in first trimester: A case report

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Abstract

Uterine rupture is one of the obstetric emergency complications affecting both the mother and fetus. Various risk factors contribute to the condition such as uterine scar and uterine anomalies , usually occurring in the late second and in the third trimester. However, it can occur in the first trimester which is extremely rare.

Obstetricians should consider this diagnosis in a pregnant woman especially after ruling out more common conditions.

Our case was a spontaneous uterine rupture at 13 weeks of gestation in a 28-year-old female.

The initial impression was a ruptured ectopic pregnancy with hemoperitoneum.

An emergency laparotomy revealed a ruptured uterus and the presence of a large amount of blood in the abdominal cavity.

Clinical signs of uterine rupture in early pregnancy are non-specific and should be distinguished from acute abdominal emergencies.

Key words: Uterine rupture, first trimester pregnancy

Introduction

Uterine rupture is a hot obstetric emergency requiring rapid action and intervention from obstetricians to save the mother and fetus (1).

There are several risk factors that contribute to this condition, but the most common risk factor is uterine scar either due to caesarean section or uterine surgery (2,3).

This condition occurs in the late second and in the third trimester or during labour but s extremely rare in the first trimester with few cases reported in literature.

We report a case of a multiparous women with multiple uterine surgery who presented with hemoperitoneum and uterine rupture.

Case report

A 28 year old multiparous woman with a history of previous 4 caesarean sections complicated by uterine rupture at term in the last pregnancy, presented to us one year later at 13 weeks of gestation with severe lower abdominal pain and heavy vaginal bleeding while working at her house.

The patient was semi-conscious with a heart rate of 121 BPM and a blood pressure of 84/42 for which an IV access was obtained, and fluids were given immediately, and bloods were sent for FBC, X-match and 4 units of blood were prepared.

On examination the abdomen was rigid and tender to palpate.

Ultra sound was done at the bed side which showed a small haematoma close to the uterus and a moderate amount of fluid in the abdomen and the pouch of Douglas with a fetus of 12 weeks of age with no fetal heart.

A decision was done to take the patient to theatre for laparotomy.

In theatre haemoglobin was 65 gm/dl so 2 units of blood were given.

Laparotomy revealed a large amount of blood in the abdomen with a large organized haematoma (Figures 1,2)

A site in the anterior wall at the site of previous caesarean scar was open and a sac was protruding from it. The sac was removed intact (Figures 3,4) and abdomen cleaned.

The opening was sutured with 1 vicryl suture and haemostasis was secured.

2 more units were given post operatively.

The patient's post-operative recovery was uneventful, and the patient was discharged after 4 days during which findings were explained to her and an advice of earlier caesarean section in case of a new pregnancy.

Discussion

Information obtained from literature showed that most cases had various risk factors (4).

It is important to remember that the most important cause to determine the risk of uterine rupture is whether the uterus has had previous scar or not (2).

Previous injuries to the uterus such as caesarean section, hysteroscopic resection of uterine septum, and myomectomy are all considered as predisposing factors for uterine rupture (5).

The incidence rate of uterine rupture is 1:17000-20000 (6) with a morbidity and mortality estimated between 20-65% (7).

Other factors that contribute to uterine rupture in an intact uterus include high parity (4 or more), uterine abnormalities, obstetric manoeuvres, abnormal placentation, malpresentation, excessive use of oxytocin and misoprostol (8), vigorous fundal pressure during delivery and cocaine abuse (9).

There are also some research reports that observed a non-gravid uteri rupture (10,11).

In our case the patient had a previous uterine surgery which is considered as a risk factor on top of which there is a history of trauma to the abdomen.

Clinical signs of uterine rupture in early pregnancy are non-specific and must be distinguished from other causes of acute abdomen. Abdominal pain and vaginal bleeding are classical and important findings.

Differential diagnosis includes bleeding corpus luteum, heterotopic or ectopic pregnancy and molar pregnancy with secondary invasion (12) with the most relevant one being ectopic pregnancy (13).

Ultrasound may sometimes have limited value and urgent surgical intervention is crucial to prevent catastrophic consequences.

An emergency laparoscopy and laparotomy is required (depending on the findings, condition of the patient and skills of the surgeon) it must be done to facilitate the correct diagnosis and proper management of the patient to reduce maternal and fetal morbidity and mortality rates associated with uterine rupture.

In our case a laparotomy was done due to instability of the patient and an early surgical intervention was the key to successful management.

The management mainly depends on the extent of the lesion, parity, age and condition of the patient, and expertise of the surgeon.

Figure 1

Figure 2

Figures 1 and 2 an organized haematoma and free blood in abdomen

Figure 3

Figure 4

In the past hysterectomy was the preferred management option however recent studies showed suturing of the rupture can be performed with or without bilateral tubal ligation depending on the women's wish to preserve fertility.

The risk of recurrence is between 4-19% at a subsequent pregnancy (14) for this reason all women should be counselled on the need to go for a caesarean section in future pregnancies.

In our case uterine suturing was done without tubal ligation due to social and religious reasons.

Conclusion

Uterine rupture in first trimester is very rare and can end up with catastrophic results.

An early diagnosis and a fast surgical intervention can be the difference between good outcomes and catastrophic results.

References

1. Guèye M, Mbaye M, Ndiaye-Guèye MD, et al. Spontaneous uterine rupture of an unscarred uterus before labour. Case Reports in Obstetrics and Gynecology. 2012;2012:3 pages.598356 [PMC free article][PubMed]
2. Turner MJ. Uterine rupture. Best Pract Res Clin Obstet Gynaecol. 2002;16:69–79. [PubMed]
3. Kong KY, Chang SK, Kim YJ, Lee JY, Chung JK. A clinical evaluation on the rupture of the gravid uterus. Korean J Obstet Gynecol. 1993;36:1486–1490.
4. Suner S, Jagminas L, Peipert JF, Linakis J. Fatal spontaneous rupture of a gravid uterus: Case report and literature review of uterine rupture. J Emerg Med. 1996;14:181–185. [PubMed]
5. Cunningham FC, Gant NF, Leveno KJ, Gilstrap LC, III, Hauth JC, Wenstrom KD. Williams Obstetrics.21st ed. McGraw-Hill; 2001. Obstetrical hemorrhage; pp. 619–669.
6. Ofir K, Sheiner E, Levy A, Katz M, Mazor M. Uterine rupture: differences between a scarred and an unscarred uterus. American Journal of Obstetrics and Gynecology. 2004;191(2):425–429. [PubMed]
7. Schrinsky DC, Benson RC. Rupture of the pregnant uterus: a review. Obstetrical and Gynecological Survey. 1978;33(4):217–232. [PubMed]
8. Berghahn L, Christensen D, Droste S. Uterine rupture during second-trimester abortion associated with misoprostol. Obstet Gynecol. 2001;98:976–977. [PubMed]
9. Mishra A, Landzberg BR, Parente JT. Uterine rupture in association with alkaloidal cocaine abuse. Am J Obstet Gynecol. 1995;173:243–244. [PubMed]
10. Chan LY, Yu VS, Ho LC, Lok YH, Hui SK. Spontaneous uterine perforation of pyometra: a report of three cases. J Reprod Med. 2000;45:857–860. [PubMed]
11. Ding DC, Chu TY, Liu JY. Menstruation-induced uterine rupture. Int J Obstet Gynaecol. 2000;69:171–172. [PubMed]
12. Ijaz S, Mahendru A, Sanderson D. Spontaneous uterine rupture during the 1st trimester: a rare but life-threatening emergency. Journal of Obstetrics and Gynaecology. 2011;31(8):p. 772. [PubMed]
13. Singh A, Jain S. Spontaneous rupture of unscarred uterus in early pregnancy—a rare entity. Acta Obstetricia et Gynecologica Scandinavica. 2000;79(5):431–432. [PubMed]
14. Ahmadi S, Nouira M, Bibi M, et al. Uterine rupture of the unscarred uterus. About 28 cases. Gynecologie Obstetrique Fertilite. 2003;31(9):713–717. [PubMed]

Intra-articular injection of hyaluronic acid inpatients with knee osteoarthritis in Aden, Yemen

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Abstract

Background: Knee osteoarthritis is a chronic degenerative joint disease, characterized clinically by gradual development of fluctuating joint pain, swelling, stiffness, and loss of motion.

The aim of the study was to determine the characteristics of the patients, some aspects of the clinical findings and the outcome of treatment procedure.

Materials and method: It was a retrospective descriptive study of patients suffering from knee osteoarthritis and who had been treated by the use of intra-articular injection of hyaluronic acid. The study was conducted from January 2016 to December 2016 in a private hospital in Aden. The patients' charts were retrieved and the study data obtained.

Results: The study patients were 112 (males 54.5% and females 45.5%). The ratio male to female was 1.2:1.

The age of patients ranged between 60 to 88 years.

Most of the patients 50 (44.6%) were of age group 60 – 70 years followed by the age group 71 – 80 years with 42 (37.5%). The mean age of all patients was 72.8 ± 7.2 years. The body mass index (BMI) ranged between 27 – 41 kg/m2. Obesity of the patients (BMI between 30 – 39.9 kg/m2) were predominant 100 (89.3%).

Most of the patients were from rural areas (75.0%). The sites of knee osteoarthritis were bilateral (50.0%), right knee (25.9%) and left knee (24.1%).

The total number of affected knee joints was 168. Moderate pain was predominant 89 (53.0%) followed by severe pain 66 (39.2%). Morning stiffness was found in 76.8% patients. The follow up period ranged between 6 to 12 weeks.

Sixty nine percent of treated OA knee joints improved, 13.8% deteriorated and 17.2% did not improve.

Conclusion: As a result of the follow-up we found 69% of treated OA knee joints were improved due to the use of intra-articular hyaluronic injections.

Key words: Knee osteoarthritis, Intra-articular injection, hyaluronic acid, Aden, Yemen

Introduction

Knee osteoarthritis (OA), is a chronic degenerative joint disease, characterized clinically by gradual development of fluctuating joint pain, swelling, stiffness, and loss of motion [1].

A recent study revealed that OA is a leading cause of disability, with 10% of men and 13% of women over 60 years of age suffering from symptomatic OA of the knee [2].

The incidence of OA is higher in women compared with men, and aging, obesity, genetics and biomechanical predisposing factors are risk factors for the initiation and progression of OA [3].

Patients with OA are vulnerable to morbidity, disability and functional deficits [4].

The number of patients with OA is estimated at 151 million worldwide. Symptomatic knee OA has emerged as the most common form of OA in the elderly aged 65 years or older [5].

Viscosupplementation with intra-articular hyaluronans (HA) is the latest pharmacological treatment for OA.

Intra-articular hyaluronic acid injections, also known as viscosupplementation, are widely used by orthopedic surgeons to treat knee OA [6]. There has been some debate about the effectiveness of viscosupplementation in earlier studies, most of which were manufacturer-sponsored studies. However, a Cochrane review of 76 clinical trials concluded that viscosupplementation was effective for treating knee osteoarthritis [7]. The treatment effect often lasted for up to four months and led to improvements in pain and function [7,8].

The aim of our study was to determine the characteristics of the patients, some aspects of the clinical findings and the outcome of treatment procedures.

Materials and method

This is a retrospective descriptive study of patients suffering from knee osteoarthritis and treated by the use of intra-articular injection of hyaloronic acid (HA).

The study was conducted from January 2016 to December 2016 in a private hospital in Aden.
During the study period, a total of 112 patients were seen at the outpatient clinic of the private hospital with chronic osteoarthritis and they were examined and treated with intra-articular knee injections of low molecular density HA.

The patients' charts were retrieved and information about sex, age, residency, osteoarthritis knee side, body mass index (BMI), type of pain (of each effected knee joints), morning stiffness (of each effected knee joints), duration of follow-up, and the outcome of the treatment procedures was obtained. Body Mass Index (BMI) was defined as weight in kilograms divided by the square of patient's height in meters. Patients were stratified by obesity status into 4 groups according to their BMI values: <25 kg/m² (underweight), 25-29.9 kg/m² (overweight), 30-39.9 kg/m² (obese), and = 40 kg/m² (morbidly obese) [9].

The data was entered into a computer and analyzed using SPSS version 17, statistical package. For variables difference, chi-square tests, and P values were calculated. A p-value of < 0.05 was considered statistically significant.

Results

In the study period, a total of 112 patients who suffered from chronic knee osteoarthritis were seen and treated by the author at the private hospital in Aden.

Table 1 summarizes the characteristic variables of patients with knee joint osteoarthritis. The study patients were 61 (54.5%) males and 51 (45.5%) females with the ratio of male to female 1.2:1. The age of patients ranged between 60 to 88 years.

Most of the patients 50 (44.6%) were of age group 60 – 70 years followed by the age group 71 – 80 years with 42 (37.5%) and > 80 years 20 (17.9%). The mean age of all patients was 72.8 ± 7.2 years, and the mean age of males was 72.1 ± 7.0 years and for women it was 73.6 ± 7.4 years. By comparing between means using Anova table in SPSS no positive relationship was found between values (p > 0.05).

The Table revealed that the BMI ranged between 27 – 41 kg/m2. The obesity of the patients (BMI between 30 – 39.9 kg/m2) were predominant 100 (89.3%) followed by overweight (BMI between 25 – 29.9 kg/m) with 9 (8.0%) and morbidly obese (BMI = = 40 kg/m2) were 3 (2.7%).

Patients from rural areas were predominant 84 (75.0%).

Figure 1 displays the sites of knee osteoarthritis which were bilateral (50.0%), right knee (25.9%) and left knee (24.1%).

Table 2 shows the total number of affected knee joints which was 168. It revealed that 85 (50.6%) were in the right side and 83 (40.9%) in the left side. Moderate pain was predominant 89 (53.0%) followed by severe pain 66 (39.2%) and mild pain 13(7.8%). It showed also that 129(76.8%) patients were complaining of morning stiffness.

Table 3 shows the right and left knees OA related to type of pain, morning stiffness and outcome.

In general, pain was slightly more 85 (50.6%) in the right knee OA and in left knee OA was 83 (49.4%).

Table 1: Characteristic variables of patients with knee joint osteoarthritis (n = *112*)

Variables	Range	Mean ± SD	No	%
Sex:				
Males			61	54.5
Females			51	45.5
Age range (years):	60 – 88			
Age groups (years):				
60 – 70			50	44.6
71 – 80			42	37.5
> 80			20	17.9
Mean Age (years):				
Age of all patients		72.8 ± 7.2		
Age of males		72.1 ± 7.0		
Age of females		73.6 ± 7.4		
P-value		P > 0.05		
Range BMI (kg/m²)	27 – 41			
BMI groups (kg/m²):				
25 – 29.9			9	8
30 – 39.9			100	89.3
≥ 40			3	2.7
Body mass index (BMI):				
All patients		33.7 ± 2.5		
Men		33.8 ± 2.5		
Women		33.5 ± 2.5		
P-value		P > 0.05		
Residency:				
Urban areas			28	25.0
Rural areas			84	75.0

Figure 1: Site percentage of osteoarthritis among the study patients

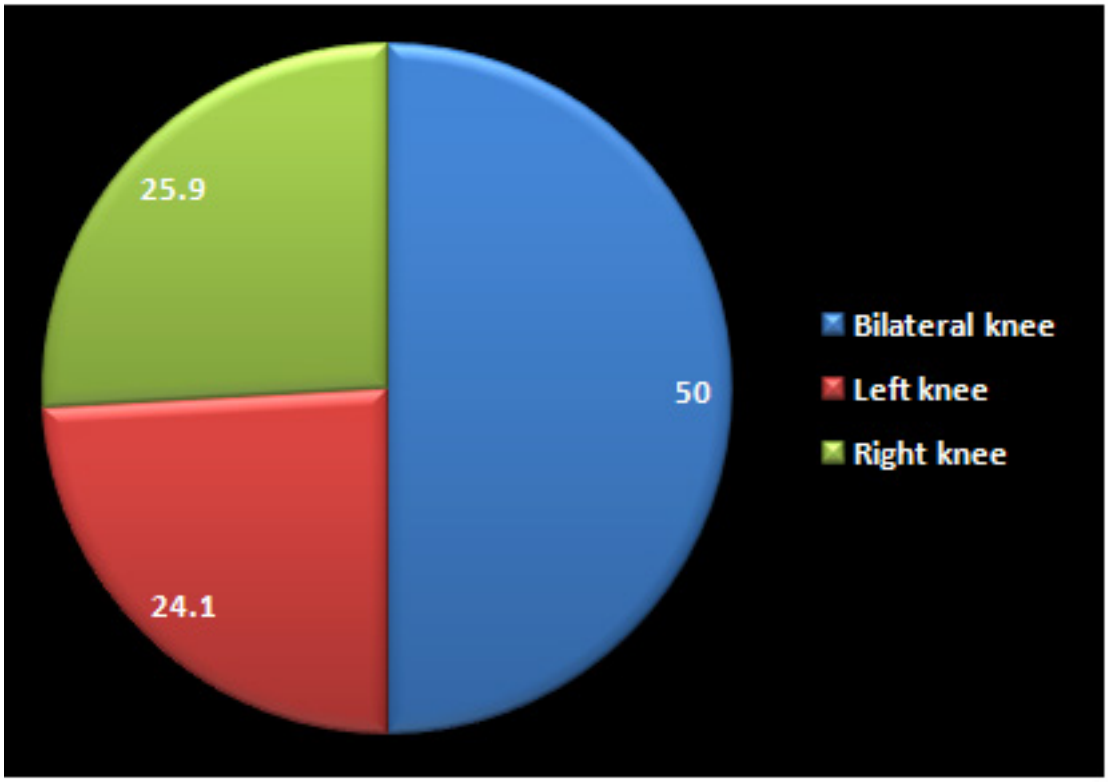


Table 2: Distribution of knee joint osteoarthritis among the study patients (n = 168)

Variables	Frequency	%
Site of all knee joints:		
Right	85	50.6
Left	83	49.4
Type of pain:		
Moderate	89	53.0
Severe	66	39.2
Mild	13	7.8
Morning stiffness:		
Yes	129	76.8
No	39	23.2

Table 3: Site of knee OA related to type of pain and morning stiffness (n=168)

Variables	Right knees n = 85 (50.6%)		Left knees n = 83 (49.4%)		Total n = 168 (100%)		p-value
Type of pain:							
Moderate	43	(25.6)	46	(27.4)	89	(53.0)	P > 0.05
Severe	33	(19.6)	33	(19.6)	66	(39.2)	
Mild	9	(5.4)	4	(2.4)	13	(7.8)	
Morning stiffness							
Yes	71	(42.3)	58	(34.5)	129	(76.8)	P < 0.05
No	14	(8.3)	25	(14.9)	39	(23.2)	

Figure 2: Percentage of follow up periods for all study patients

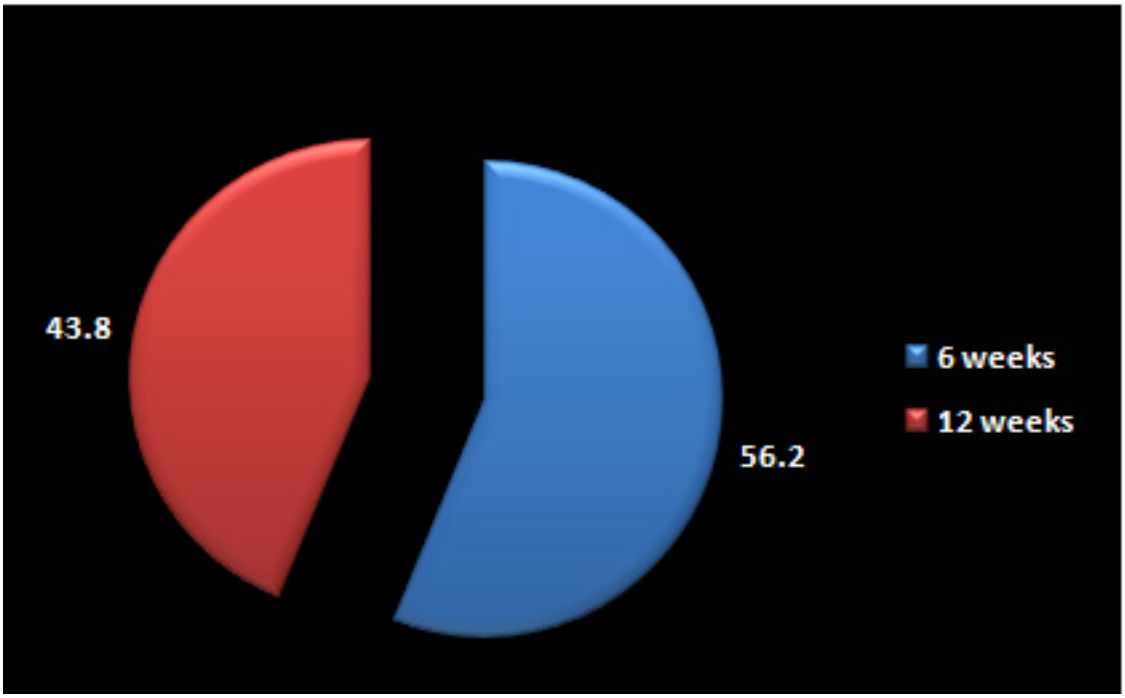
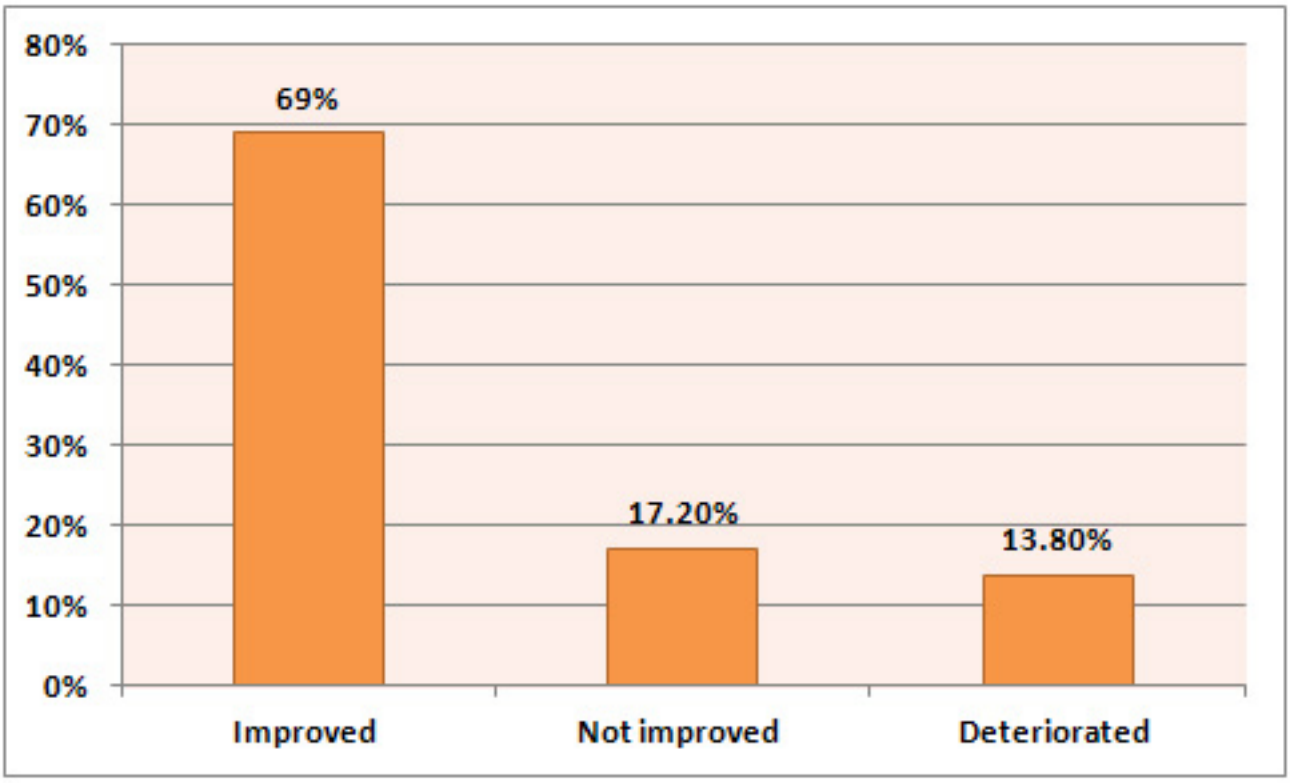


Figure 3: Illustration of treatment outcome of the total OA knee joints (n=168)



Moderate pain in the right and left knee joint were to some extent similar 43 (25.6%) and 46 (27.4%) respectively. Also, severe pain in both knee joints was similar and the difference appeared in mild pain 9 (5.4%) in the right knee joints and 4 (2.4%) in the left knee joints. The difference between values is not statistically significant ($p > 0.05$). Morning stiffness was more in the right knee joints 71 (42.3%), while in the left knee joints was 58 (34.5%). The difference between values is statistically significant ($p < 0.05$).

The follow up period ranged between 6 to 12 weeks. 56.2% of the study patients were followed for 6 weeks and 43.8% of the patients were followed for up for 12 weeks, as shown in Figure 2.

Figure 3 reveals the proportions of the outcome of our treatment procedures (injection with HA) for all OA knee joints. Sixty nine percent of treated OA knee joints were improved, 13.8% deteriorated and 17.2% were not improved.

Discussion

The first studies on the use of HA in human knee OA were carried out in the 1970s by Rydell and Balasz (1971) [10] and Peyron and Balasz (1974) [11]. In 1974, Peyron injected 1, 2, or 3 ml of HA (Healon) in 23 knees and obtained positive responses in pain and function in 74% of patients. The treatment with two injections of 2 ml HA each appeared to have the best outcome [12].

To our knowledge, this is the first retrospective and observational study on the use of intra-articular injection of hyaluronic acid (HA) in patients with osteoarthritis of knee joint in Aden.

In the present study male patients were predominant 61 (54.5%) while females were 51(45.5%). The ratio male to female was 1.2:1.

Women are at greater risk for developing knee osteoarthritis [13,14] compared with men, particularly those over 50 years of age [14].

Women with OA have also been found to have greater levels of knee pain and lower function [15]. However, a greater prevalence of radiographic knee OA in women [16] could account for sex differences in knee pain and function [15].

In the world, it is estimated that 10%–15% of all adults aged over 60 have some degree of OA, with prevalence higher among women than men [17].

According to data produced by the Dutch Institute for Public Health, the prevalence of knee OA in those aged 55 and above was 15.6% in men and 30.5% in women, respectively [18].

Our findings differ from those of other studies that revealed that knee osteoarthritis affects more women than men.

Our explanation for this difference is that our study was limited to patients in one private clinic. Also, it may be due to the women's choice of female orthopedic doctors as a result of traditions and religious reasons in our society.

In our study we found that the BMI ranged between 27 – 41 kg/m2. The obesity of the patients (BMI between 30 – 39.9 kg/m2) was predominant 100 (89.3%) followed by overweight (BMI between 25 – 29.9kg/m) with 9 (8.0%) and

the morbidly obese (BMI = = 40 kg/m2) were 3 (2.7%).

Hasan et al [19] mentioned that every step taken in a normal gait places about three times an individual's body weight on lower limb joints. Thus it should not be surprising that obesity and high body mass index have long been recognized as potent risk factors for OA, especially medial compartment OA of the knee in females.

The Framingham Study found that women who lost about 5 kg had a 50% reduction in the risk of developing new symptomatic knee OA [20]. Weight-loss interventions have been shown to decrease pain and disability in established knee OA.

The Arthritis, Diet, and Activity Promotion Trial showed that weight loss combined with exercise, but not either weight loss or exercise alone, was effective in decreasing pain and improving function in obese elders who already had symptomatic knee OA [21].

In the present study the patients from rural areas were predominant (75.0%).

A study done in Asian countries of India, Pakistan, and Bangladesh showed a higher prevalence of OA knee in rural areas which was 13.7% as compared to 6.9% in urban areas [22].

Community survey data in rural and urban areas of India show the prevalence of OA to be in the range of 17%–60.6% [23].

A study conducted in India among adults had shown a significant difference in the prevalence of OA between rural (56.6%) and urban areas (32.6%) [23]. Due to the lifestyle habits, Asians have a higher risk for knee joint arthritis compared to Americans and Europeans [22].

The age of the patients in our study ranged between 60 to 88 years and most of the patients (44.6%) were of age group 60 – 70 years followed by the age group 71 – 80 years with (37.5%) and over 80 years (17.9%). Also, the mean age of the study patients was 72.8 ± 7.2 years. The mean age of all patients was 72.8 ± 7.2 years, and the mean age of males was 72.1 ± 7.0 years and for women it was 73.6 ± 7.4 years. There was no statistical significance between means ($p > 0.05$).
Christensen et al [24] reported that age is the greatest risk factor in the development of OA and the prevalence of the disease increases with age, reaching 20% in the 45 years of age group, 40% in the 55 years of age group, 70% in the 65 years of age group, and 80% in geriatric patients over age 75 with osteoarthritis of the knee. Also, Haq et al [25] mentioned that review of many studies in the literature reveals that the mean age of the OA patients in these studies was 65 years and over.

Bakirhan et al [9] reported that in their study the mean age of the 320 patients was 66.92 years. This finding supports the finding in our study that the highest frequency of osteoarthritis is observed in people aged 60-70 years.

In the current study we found the sites of knee osteoarthritis were bilateral 56(50.0%), right knee 29(25.9%) and left knee 27(24.1%). So, we observed that bilateral knee osteoarthritis site was predominant.

Cross sectional studies have shown that bilateral knee pain is a frequent problem in the community and each additional joint affected by osteoarthritis results in a decrease in physical function and an increase in overall pain [26,27].

A recent study demonstrated that bilateral knee pain was an independent risk factor for poor physical function [28].

Whereas joint injury (bony or soft tissue) usually affects one joint alone; there are many reasons why knee osteoarthritis would tend to progress to bilateral disease. Genetic influences and inherent mal-alignment would be expected to lead to bilateral disease [29]. A recent gait analysis study found abnormal loading in the unaffected knee of patients with unilateral knee osteoarthritis, implying that patients with a painful joint may accelerate disease in other joints due to changes in gait [30].
Gunther et al [31] reported that bilateral knee osteoarthritis is particularly common in people with advanced disease.

In a previous study with 2-year follow-up, 34% of patients with unilateral disease subsequently developed disease in the contra-lateral knee, however follow up was relatively short and the study was restricted to females only [32].

In the present study moderate pain was predominant 89 (53.0%) followed by severe pain 66 (39.3%) and mild pain 13 (7.7%).

Hawamdeh et al [33] found in their study 44.8% had severe pain, 38.3% had moderate pain, and 16.8% had mild pain. The types of pain vary between our finding and finding of Hawamdeh et al from Jordan [33].

The most common symptom of knee OA is pain around the knee joint. Pain can be dull, sharp, constant, or intermittent (off and on). Pain can vary from mild to agonizing. Range of motion can be decreased. These disabilities, mainly related to pain, are usually manifested by difficulty in walking, climbing stairs, performing household chores, and sitting upright and have a negative psychological impact, all of which can lead to a decreased quality of life. Knee pain can develop slowly and worsen over time (most common), or pain can have a sudden onset [34].

In the present study we found that 129 (76.8%) patients complained of morning stiffness. Morning stiffness was more in the right knee joints 42.3%, while in the left knee joints was 34.5%.

The difference between morning stiffness and values of right and left knee osteoarthritis was statistically significant ($p < 0.05$).

Knee pain and stiffness in the morning, after sitting, or after prolonged rest are most common. Over time, painful symptoms may occur more frequently, including during rest or at night. Typically, pain flares up with vigorous activity. Joint pain and stiffness after sitting or prolonged rest typically loosens up in less than 30 minutes, known as gelling [34].

In our study the follow up period ranged between 6 to 12 weeks. 56.2% of the study patients were followed for 6 weeks and 43.8% of the patients were followed for up to 12 weeks. As a result of this follow-up we found 69% of treated OA knee joints were improved, 13.8% deteriorated and 17.2% were not improved.

Multiple studies have been conducted to evaluate the efficacy of intra-articular hyaluronic injections. Initial studies [11,35] in the 1970s and 1980s demonstrated benefits for hyaluronic injected knees.

Conclusion

The patients in this study were characterized by the majority of obese patients and most patients complained of moderate pain followed by severe pain. Most of the patients complained of morning stiffness. As a result of the follow-up we found 69% of treated OA knee joints were improved due to the use of intra-articular hyaluronic injections.

References

1. Moreland LW. Intra-articular hyaluronan (hyaluronic acid) and hylans for the treatment of osteoarthritis: mechanisms of action. Arthritis Res Ther. 2003; 5(2): 54–67.
2. Zhang Y, Jordan JM. Epidemiology of osteoarthritis. Clin Geriatr Med. 2010; 2 6:355–369.
3. Robinson WH, Lepus CM, Wang Q, Raghu H, Mao R, et al. Low-grade inflammation as a key mediator of the pathogenesis of osteoarthritis. Nat Rev Rheumatol. 2016; 12:580–592.
4. Rosemann T, Laux G, Kuehlein T. Osteoarthritis and functional disability: results of a cross sectional study among primary care patients in Germany. BMC Musculoskelet Disord. 2007; 8:79.
5. Bhatia D, Bejarano T, Novo M. Current interventions in the management of knee osteoarthritis. J Pharm Bioallied Sci. 2013; 5: 30–8.
6. Keith Sinusas. Osteoarthritis: Diagnosis and Treatment. Am Fam Physician. 2012; 85(1): 49-56.
7. Bellamy N, Campbell J, Robinson V, Gee T, Bourne R, Wells G. Viscosupplementation for the treatment of osteoarthritis of the knee. Cochrane Database Syst Rev. 2006;(2): CD005321.
8. Goldberg VM, Goldberg L. Intra-articular hyaluronans: the treatment of knee pain in osteoarthritis. J Pain Res. 2010; 3: 51–56.
9. Bakirhan S, Bozan O, Unver B, Karatosun V. Evaluation of functional characteristics in patients with knee osteoarthritis. Acta Ortop Bras. [online]. 2017; 25(6): 248-52.
10. Rydell NW, Balasz EA. Effect of intra-articular injection of hyaluronic acid on the clinical symptoms of osteoarthritis and on granulation tissue formation. Clin Orthop. 1971; 80:25–32.
11. Peyron JG, Balasz EA. Preliminary clinical assessment of
Na-hyaluronate injection into human arthritic joint. Pathol Biol (Paris). 1974; 22: 731–6.
12. Migliore A, Granata M. Intra-articular use of hyaluronic acid in the treatment of osteoarthritis. Clinical Interventions in Aging. 2008; 3(2): 365–369
13. Felson DT, Zhang Y, Hannan MT, Naimark A, et al. Risk factors for incident radiographic knee osteoarthritis in the elderly: the Framingham Study. Arthritis Rheum. 1997; 40: 728–733.
14. Oliveria SA, Felson DT, Reed JI, Cirillo PA, Walker AM. Incidence of symptomatic hand, hip and knee osteoarthritis among patients in a health maintenance organization. Arthritis Rheum. 1995; 38: 1134–1141.
15. Ebrahimpour PB, Do HT, Bornstein LJ, Westrich GH. Relationship between demographic variables and preoperative pain and disability in 5945 total joint arthroplasties at a single institution. The Journal of Arthroplasty. 2011; 26: 133–137.
16. Srikanth VK, Fryer JL, Zhai G, Winzenberg TM, Hosmer D, Jones G. A meta-analysis of sex differences prevalence, incidence and severity of osteoarthritis. Osteoarthritis Cartilage. 2005; 13: 769–781.
17. World Health Organization. Department of Chronic Diseases and Health Promotion. Available from: http://www.who.int/chp/topics/rheumatic/en/. [Last accessed on 2017
18. Bijlsma JW, Knahr K. Strategies for the prevention and management of osteoarthritis of the hip and knee. Best Pract Res Clin Rheumatol. 2007; 21: 59-76
19. Hasan M, Shuckett R. Clinical features and pathogenetic mechanisms of osteoarthritis of the hip and knee. BCMJ. 2010; 52(8): 393-398
20. Felson DT, Zhang Y, Anthony JM, et al. Weight loss reduces the risk for symptomatic knee osteoarthritis in women. The Framingham Study. Ann Intern Med. 1992; 116: 535-539.
21. Messier SP, Loeser RF, Miller GD, et al. Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis: The Arthritis, Diet, and Activity Promotion Trial. Arthritis Rheum. 2004; 50: 1501-1510.
22. Fransen M, Bridgett L, March L, Hoy D, Penserga E, Brooks P, et al. The epidemiology of osteoarthritis in Asia. Int J Rheum Dis. 2011; 14: 113-21
23. Sharma MK, Swami HM, Bhatia V, Verma A, Bhatia S, Kaur G. An epidemiological study of co-relates of osteoarthritis in geriatric population of Chandigarh. Indian J Community Med. 2013; 32: 77
24. Christensen R, Astrup A, Bliddal H. Weight loss the treatment of choice for knee osteoarthritis? A randomized trial. Osteoarthritis Cartilage. 2005;13(1):20–27.
25. Haq SA, Davatchi F. Osteoarthritis of the knees in the COPCORD world. Int J Rheum Dis. 2011; 14(2): 122–129.

26. Dawson J, Linsell L, Zondervan K, et al. Epidemiology of hip and knee pain and its impact on overall health status in older adults. Rheumatology (Oxford). 2004; 43:497–504.
27. Keenan AM, Tennant A, Fear J, et al. Impact of multiple joint problems on daily living tasks in people in the community over age fifty-five. Arthritis Rheum. 2006; 55:757–764.
28. White DK, Zhang Y, Felson DT, et al. The independent effect of pain in one versus two knees on the presence of low physical function in a multicenter knee osteoarthritis study. Arthritis Care Res (Hoboken). 2010; 62:938–943.
29. Valdes AM, McWilliams D, Arden NK, et al. Different risk factors are involved in clinically severe large joint osteoarthritis according to the presence of hand interphalangeal nodes. Arthritis Rheum. 2010; 62:2688–2695.
30. Metcalfe AJ, Stewart C, Postans N, Dodds A, Smith H, Holt C, Roberts A. The effect of osteoarthritis of the knee on the biomechanics of other joints in the lower limbs. Bone Joint J 2013; 95-B:348–53.
31. Gunther KP, Sturmer T, Sauerland S, et al. Prevalence of generalized osteoarthritis in patients with advanced hip and knee osteoarthritis: the Ulm Osteoarthritis Study. Ann Rheum Dis. 1998; 57:717–723.
32. Spector TD, Hart DJ, Doyle DV. Incidence and progression of osteoarthritis in women with unilateral knee disease in the general population: the effect of obesity. Ann Rheum Dis. 1994; 53:565–568.
33. Hawamdeh ZM, Al-Ajlouni JM. The Clinical Pattern of Knee Osteoarthritis in Jordan: A Hospital Based Study. Int J Med Sci. 2013; 10 (6):790-795
34. Mahir L, Belhaj K, Zahi S, Azanmasso H, Lmidmani F, El Fatimi A. Impact of knee osteoarthritis on the quality of life. Ann Phys Rehabil Med. 2016 Sep; 59(Suppl): e159.
35. Peyron JG. Intraarticular hyaluronan injections in the treatment of osteoarthritis: state-of-the-art review. J Rheumatol. 1993;39(suppl):10–5.