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Editorial

This issue is rich with topics of concerns to primary care in the Region and Worldwide.

Alqurashi A.O et al carried a case-control study design, 100 autistic children 3-12 years old were selected from four rehabilitation autistic children in addition to 100 age-matched non-autistic children (control group) who were recruited from nearby kindergarten centers and primary schools. The aim was to identify risk factors associated with autism among autistic children in Makkah Al-Mukarramah City. Most autistic children (74%) were diagnosed at the age of 4-8 years. The mean age at diagnosis was 6.1±2.4 years.. Mothers of autistic children have been significantly more exposed to smoke than those of non-autistic children (15% and 6%, respectively, p=0.038). Autistic and non-autistic children did not differ significantly according to their family, prenatal and postnatal characteristics. The author concluded that most autistic children become diagnosed at 4-8 years old. The female: male ratio among autistic children is about 1:3. Advanced parental age is a significant risk factor for autism among their children. Exposure of mothers to smoke is a risk factor for autism among her children.

In two papers the issues of mental health in Qatar within primary care was presented. Zada K and Anwarulhaq M evaluated the the quality of mental health referrals from primary care physicians in Qatar. They collected 234 psychiatric referrals from Qatari primary care clinics and assessed their quality using a seven-item inclusion checklist derived from existing research and best practices. Psychiatrists rated all of the checklist items as important, with "reason for referral" and HPI rated as most important. The authors concluded that mental health referrals from primary care physicians in Qatar suffer from a profound lack of basic data; reasons for

this may include gaps in primary care physicians' knowledge and self-efficacy about mental health care. Primary care physicians must be supported to improve referral quality, which will result in better and more efficient mental health care delivery. K Zada, K et al , collected anonymous surveys from primary care physicians working in the Primary Health Care Corporation (PHCC). The survey collected demographic data about the respondents, and used the well-validated Mental Illness: Clinicians' Attitude Scale (MICA-4) to assess attitudes and confidence about mental health treatment, as well as a knowledge assessment tool developed locally. There were 115 respondents, most of whom were male (67%) and aged 36-55 (80.4%). Most respondents (75.7%) had less than two years of psychiatric training or experience, and had taken two or fewer psychiatric education courses in the last year (83.4%). The authors concluded that Primary care physicians in Qatar are willing to treat mental health conditions and feel confident about doing so. They have good fundamental knowledge but appear to lack knowledge of local (PHCC) policies about managing common mental health conditions.

Azaybi H.A.H et al, carried a descriptive cross-sectional study including all physicians worked in the primary health care centers (PHCCs) in Abha City. In order to assess primary care physicians' knowledge and identify barriers against achievement of a healthy lifestyle. Also to detect which of the physicians' characteristics are significantly affecting their knowledge level. High knowledge regarding health lifestyle was recorded among 84.3% of the included physicians and 77.9% had good healthy life. None sleeping for enough duration was the most recorded barriers among physicians (62.1%) followed with non-fixed time to go sleep (55.7%). The authors concluded that knowledge of the PHCCs physician regarding healthy life style was high

especially old aged experienced physicians. Many barriers were recorded for adopting health lifestyle, especially sleeping time.

Asseri A.A did a retrospective chart review study was approved by the institutional review board at Abha Maternity and Children Hospital, Saudi Arabia. Children were also enrolled if the parents reported previous use of inhaled corticosteroids for asthma control therapy. The diagnosis of asthma was confirmed by either a pediatric allergist or a pulmonologist who was actively involved in inpatient and outpatient asthma care. Of the 128 patients enrolled in the study, 31 required PICU admissions. No statistically significant difference was detected between age and age categories (<3, 3–6, and >6 years) in children admitted to the pediatric ward and PICU. The authors concluded that previous PICU admissions and SpO2 measurements at the emergency department (ED) are independent predictors of needing intensive care admission for children between 2 and 12 years of age with acute asthma exacerbation. Nevertheless, further studies are needed to explore additional modifiable predictors that could help in identifying children with a high risk for intensive care admissions.

Al-Qahtani Y.M et al , investigated sleep quality and its associates among secondary school students. A total of 400 secondary school students (200 males and 200 females) in Abha City were included. A total of 171 students (42.8%) had poor quality of sleep, while 177 students (44.3%) had insomnia. The authors concluded that poor sleep quality and insomnia are common among secondary school students in Abha City. Females and cigarette smokers are more prone to poor sleep quality. Insomnia among secondary school students is significantly associated with older age.

Mahfouz , M.E et al, did a cross-sectional study and was done from May to August 2017. 1119 people participated in this study. The aim was assessing the knowledge and awareness about causes, risk factors, and proper management of an inguinal hernia among the population of Kingdom of Saudi Arabia (KSA). The electronic online questionnaire was published through social media in all regions of Saudi Arabia. It consists of

socio-demographic data, Past medical and surgical history, Questions related to risk factors. The authors concluded that the majority of participants in our study were not fully aware of the causes and management of a hernia. Age, marital status, education level, number of kids and occupation play a significant role in the awareness. More educational programs about inguinal hernias are needed.

Omar S.A.M et al, did a cross sectional study of randomly selected 402 patient in reproductive age, data obtained through standardized questionnaire including obstetrical , medical and surgical history information. BMI was divided according to the the WHO criteria: underweight <19, normal (19±24.9), over weight (25-29.9), and obese women (BMI >30). Recurrent pregnancy loss was no significantly more among those had ≥5 kids 2(12.5%) than those had 0-1kids 14(6.1%). Risk to have 1-2 miscarriage was significantly 0.3 times among those aged <18 years than those aged 19-30 years, and those had 2-4 kids 1.6 times than those had 0-1 kid. The authors concluded that obesity was significantly associated with increased risk of RPL, it is important to recommend females with recurrent pregnancy loss to decrease weight in order to get better results.

Helvaci M.R et al, tried to understand significance of high density lipoproteins (HDL) in metabolic syndrome. Patients with plasma HDL values lower than 50 mg/dL were collected into the first and 50 mg/dL and higher into the second groups. Although the decreased male ratio, smoking, plasma triglycerides values, and COPD, the mean age, BMI, FPG, LDL, WCH, HT, and DM increased by the increased plasma HDL values. Due to the significant relationships between male ratio, smoking, plasma triglycerides values, and COPD, HDL may not be good prognostic parameters of the metabolic syndrome.

Ditta M.A & Bham A discussed incorporating Resilience into the Family Medicine Training Curriculum. They stressed that family medicine training curriculum is of upmost importance in that it informs the learner what needs to be learned, the teacher what needs to be taught and also then determines that which is to be assessed. A study conducted using the Maslach burnout inventory (MBI) surveyed 564 GPs. The results showed 46% had high

levels of "emotional exhaustion and depersonalisation" and 34% reported low levels of personal accomplishment. Therefore the authors stressed that Training curricula can be enhanced is by incorporating 'resilience' training in to the formal curriculum. The GMC mention behaviours as well as knowledge in their definition of curriculum so resilience could be behaviour trait that is encouraged through curriculum design, planning and consideration for nations that have formal family medicine residency programmes.

Khattak F & Al Saudi H, reported a case of an atypical presentation of disseminated tuberculosis in a forty-one-year-old otherwise healthy female. Although tuberculosis has been known to mankind for centuries and there is a vaccine against the disease and multiple newer antibiotics available in today's world, still it is one of the major causes of morbidity and mortality and its presentation can be deceptive and diagnosis can be difficult.

This is a case report of a 41-year-old female who presented with a short history and acute symptoms that are atypical for tuberculosis. This case demonstrates the deceptive presentation of this disease and hence importance that clinicians need to be more vigilant, otherwise an important disease that needs timely diagnosis and treatment can be missed.

Bham A, report a case of Melanoma in Situ in Australian primary care setting. Melanoma rates in Australia are amongst the highest in the world and there is an increasing global incidence of rates of melanomas. The life time risk being 2.4% in Caucasians. A 65-year-old farmer presented to a Family Practice Clinic in Mundijong, Western Australia which is a semi-rural practice. He had a long-standing skin lesion on his upper back that had recently changed color which is a red flag. The patient had a past medical history of Ischemic Heart Disease, Mechanical Heart Valve and Atrial Fibrillation and was taking Bisoprolol, Atorvastatin, Ramipril and Warfarin. He had no allergies. This 65 year old farmer presented with a pigmented skin lesion that was assessed using dermoscopy which suggested features of melanoma. Dermoscopic examination can aid early detection of skin malignancy. An excisional biopsy revealed a Melanoma in situ.

Evaluation of the quality of mental health referrals from primary care physicians in Qatar

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Abstract

Background: Primary care providers use referrals to communicate with mental health specialists about their patients' conditions. However, these referrals are not standardized, resulting in a potentially wide variance in referral quality that, in turn, can affect the quality of patient care. Our aim was to evaluate the caliber of these referrals in Qatar, a country with high mental health utilization rates but with comparatively underdeveloped psychiatry resources at the primary care level.

Materials and Methods: We collected 234 psychiatric referrals from Qatari primary care clinics and assessed their quality using a seven-item inclusion checklist derived from existing research and best practices. Checklist items included: 1) history of present illness (HPI); 2) mental status examination (MSE); 3) risk assessment; 4) past medical history; 5) use of psychiatric assessment tools; 6) treatment given in the primary care setting and 7) reason for referral. The importance of each of these seven items was independently rated by 18 psychiatrists.

Results: Psychiatrists rated all of the checklist items as important, with "reason for referral" and HPI rated as most important. Out of 228 valid referrals, 79.8% were accepted. 31% of all referrals contained an HPI; 18.85% contained an MSE; 11.4% included a suicide risk assessment; 16.2% included past medical history; 35.5% used a psychiatric assessment tool; 18.6% described treatment given in primary care; 46.5% included the reason for referral. No single checklist item was included in at least half the referrals.

Conclusion: Mental health referrals from primary care physicians in Qatar suffer from a profound lack of basic data; reasons for this may include gaps in primary care physicians' knowledge and self-efficacy about mental health care. Primary care physicians must be supported to improve referral quality, which will result in better and more efficient mental health care delivery.

Limitations: Study limitations include the use of subjective survey data to assess the face validity of the checklist items.

Key words: primary care, referrals, psychiatry, mental health treatment, quality improvement, mental health care, Qatar

Introduction

Referral letters are the main source of clinical information sent by primary care physicians to specialists in secondary care. In order to give a complete clinical impression to the doctors in secondary care, it is extremely important that the referral letters consist of sufficient relevant clinical information about the patients. However, there is evidence that sometimes these referral letters contain insufficient information, which can ultimately result in poor patient care (1 – 4).

Primary care physicians come from a wide variety of clinical backgrounds, which can create substantial disparity in clinical expertise. Nowhere is this disparity more apparent in primary care than in the treatment of mental illness. Some PCPs have more knowledge and understanding of mental health conditions and have more clarity when it comes to referring patients to secondary care, while others are less knowledgeable and can be ambiguous in their approach to securing referrals (5).

The quality of referral letters can have significant consequences for patient treatment outcomes, for healthcare system quality and for costs (2). Mental health patients are already vulnerable, and any poor communication between their treating healthcare professionals can potentially influence their quality of care.

Qatar has set out a National Mental Health Strategy, which constitutes an important component of its National Vision 2030. According to the vision of Qatar Mental Health, the goal is to provide "good mental health and wellbeing for the people of Qatar, supported by integrated mental health services with access to the right care, at the right time and in the right place" (6). Primary health care physicians are the first point of contact with patients and play a hugely important role in the management of mental health care. It is therefore imperative that primary health care physicians have good knowledge and understanding of mental health problems. They should have a clear idea what they can safely and effectively manage in primary care and what type of patients they need to refer to secondary care. When they refer patients to secondary care, they should be able to incorporate all relevant clinical information in the letter to provide a reasonably clear clinical picture to mental health specialists.

Compared to some of the developed Western countries, psychiatric care at the primary level in Gulf countries is not as developed. Moreover, patient expectations in Gulf countries is significantly different than patients in the West: many Qatari patients expect to see a psychiatrist for any mental health problem, including mild-to-moderate anxiety or depression, which can easily be managed in primary care. Several factors determine the quality of psychiatric referrals, including the demographic details, the mental health knowledge and skills of the referring physician, the existing psychiatric services and the current system of referral / communication between primary and specialist mental health services (9, 10, 11).

A referral process essentially starts with the primary care visit when a physician takes a history and conducts a mental status examination. The clinical information gathered during the consultation is then shared with the secondary care specialist so that, together, they can make an effective and timely decision about further management of the patient's mental health condition. It is therefore very important for primary care physicians to take a comprehensive history and carry out a relevant mental status examination (8, 12,). The primary care physician should then be able to relay that clinical information in a concise and structured way to the secondary care specialists.

Method

Data was collected from the seven Western region primary health centers of Qatar over a period of six months (August 2018 to February 2019) using descriptive study design with a convenience sampling method. There were 234 psychiatric referrals included in the study. The referral notes and consultation notes of each and every patient were evaluated and studied using the Cerner electronic health record system.

A seven-items checklist (Table 1) was specifically designed to assess the quality of the psychiatric referrals. The checklist was derived from the existing research in this field, being mindful of best clinical practices. Special attention was given to the assessment tools published by Francois and Hartveit et al. (13 ,15). Francois (13) published a checklist of assessment tools for consultation and a referral letter from primary care to secondary care which has good internal validity, reliability and feasibility. Hartveit et al. (15) designed a checklist consisting of seven headings (Demographics, Introductory information and risks, Case history and social history, Current state and investigations results, Current treatment and past medical history, Patient's thoughts / perspective and Reason for the referral) after recommendations from four groups (primary health physicians, psychiatrists and psychologists, managers and patient representatives).

In this study's checklist, demographics were not included, since in Qatar all psychiatric referrals are made online using electronic health record systems. The Primary Health Care Center (PHCC) and mental health hospital both use the Cerner electronic record system. Therefore, all the demographic data – for example, Name, age, sex, address, etc. — are transferred automatically and are available to the psychiatrists.

To give face validity to the above tool, a survey was sent to all the psychiatrists working in Hamad psychiatry hospital using a Likert scale from "not important at all" to referral quality ranked "1" to "highly important" to referral quality ranked "5". A score of 3.5 was taken as significantly "important" for each component in the survey.

A total of 18 psychiatrists responded to the anonymous survey. The average scores for all the seven components of the tools are given in Table 2. All the components were

Table 1 showing Seven-items checklist – (* indicates – where applicable - as not all patients were suitable for psychiatric assessment tools and initial treatment in primary care)

1	History of presenting complaints
2	Mental status examination
3	Risk assessment
4	Past medical / psychiatric history
5	Psychiatric assessment tools (PHQ9, HADS7, EPDS, cognitive test etc.) *
6	Treatment given in the primary care setting *
7	Reason for referral

Table 2 showing the results of survey using Likert scale by psychiatrist of Hamad General Hospital where they ranked the importance of information in referral letter according to Seven-items checklist.

Seven-items Checklist	Average Score
1.History of presenting complaints	4.72
2.Past medical / psychiatric history	4.38
3.Treatment given in the primary care setting	4.55
4.Mental status examination	4.44
5.Assessment tools	3.66
6.Risk assessment	4.55
7.Reason for referral	4.83

ranked well above 4 with the exception of "assessment tools" where the average rank score was 3.66 (still above our threshold value for importance).

Data

A total of 234 referrals were recorded by the "Office of Referral Management". However, after going through individual referral and their clinical notes, there was no record found for referral for six patients. Therefore, those six patients were not included in the study and the remaining number of 228 was taken as the total referral number for the purpose of this study.

Each patient's clinical referral was studied and assessed using the seven-item checklist (Table 1). The consultation notes for that day and time were also studied, including the patients' listed medications. Each referral was assessed for the presence of the y-axis items in Figure 1, with the x-axis showing the percentage of the total referrals which contained the item.

228 patient referrals were assessed in total; out of this total, 46 (20.2%) referrals were rejected and 182 (79.8%) referrals were accepted.

Out of 228 referrals, only 71 referrals (31%) had some details of history of presenting complaints (e.g., duration and severity of symptoms and effects on activity of daily living). Only 37 referrals (16.2%) had documented

details of past medical and psychiatric history. As per Primary Health Care Corporation (PHCC) policy of Qatar, patients who present with mild to moderate GAD or depression should be treated in primary care level using antidepressants (SSRIs) and available psychology services in the community. However, the data revealed that only 28 patients received treatment in PHCC before referral to the psychiatric hospital. Even granting that not all patients were suitable for treatment in primary care (children, perinatal, elderly patients with cognitive problems learning disability patients, patients with severe mental illness and those who refused treatment at PHCC), only 18.66 % of the patients had been started on treatment at the primary care level.

Mental status examination was documented for only 43 patients (18.86%) while risk assessment details were given for only 26 (11.4%) referrals.

Similarly, in 49 referrals assessment tools (PHQ9, HAD7, EPDS and cognitive assessment, etc.) were used. Patients meeting exclusion criteria accounted for 35.5% of this subset of referrals. 26 (11.4%) referrals had mention of risk assessment.

The data showed that 98 (46.5%) referrals made mention of a reason as to why this patient should be seen by the specialist at this stage.

**Figure1 shows results for the seven-items checklist**
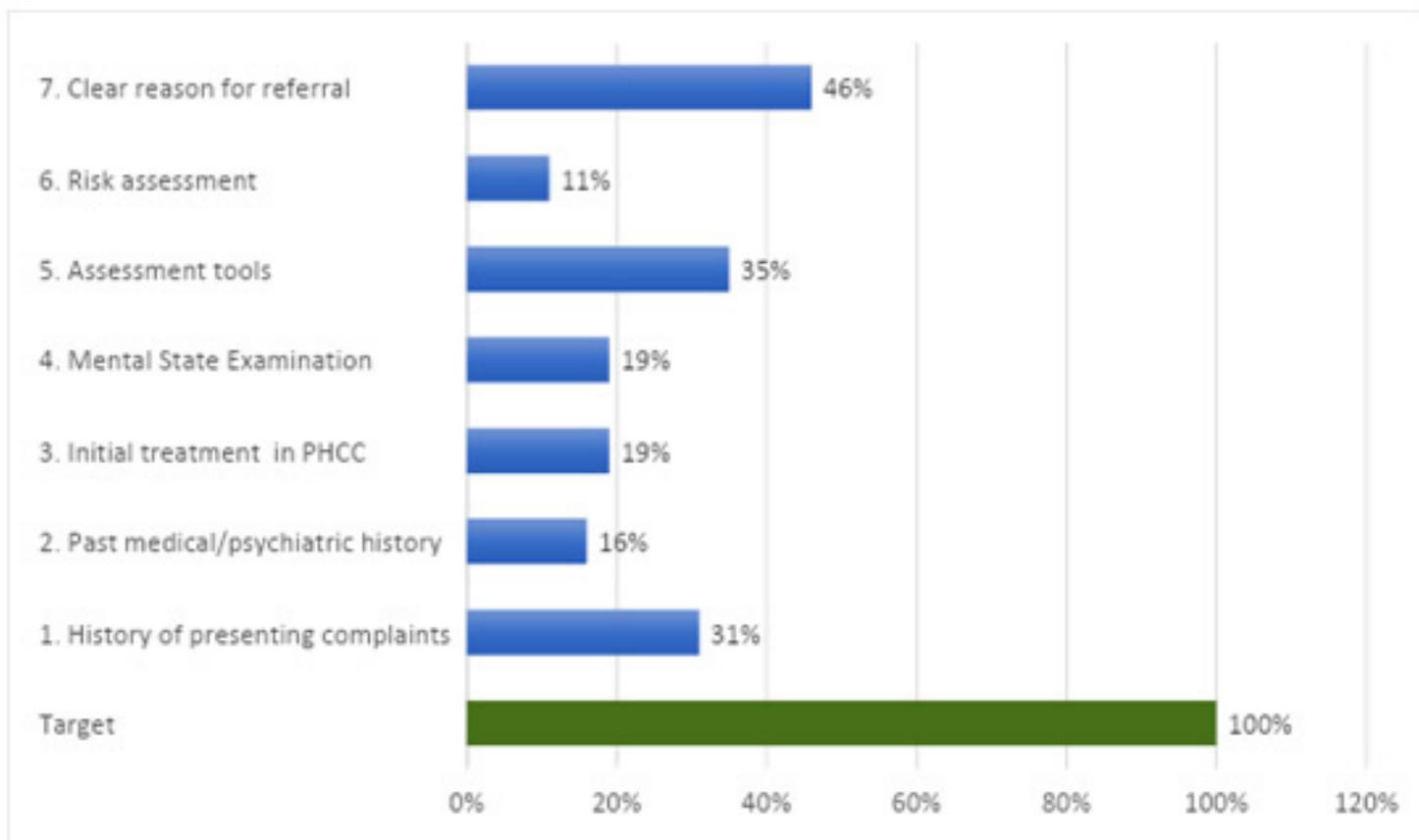
Figure 2 shows treatment given at the primary care level. (Note – The 78 patients were not suitable for initial treatment in primary care. i.e. children, perinatal, elderly patients with cognitive problems learning disability patients, patients with severe mental illness and those who refused treatment at PHCC)
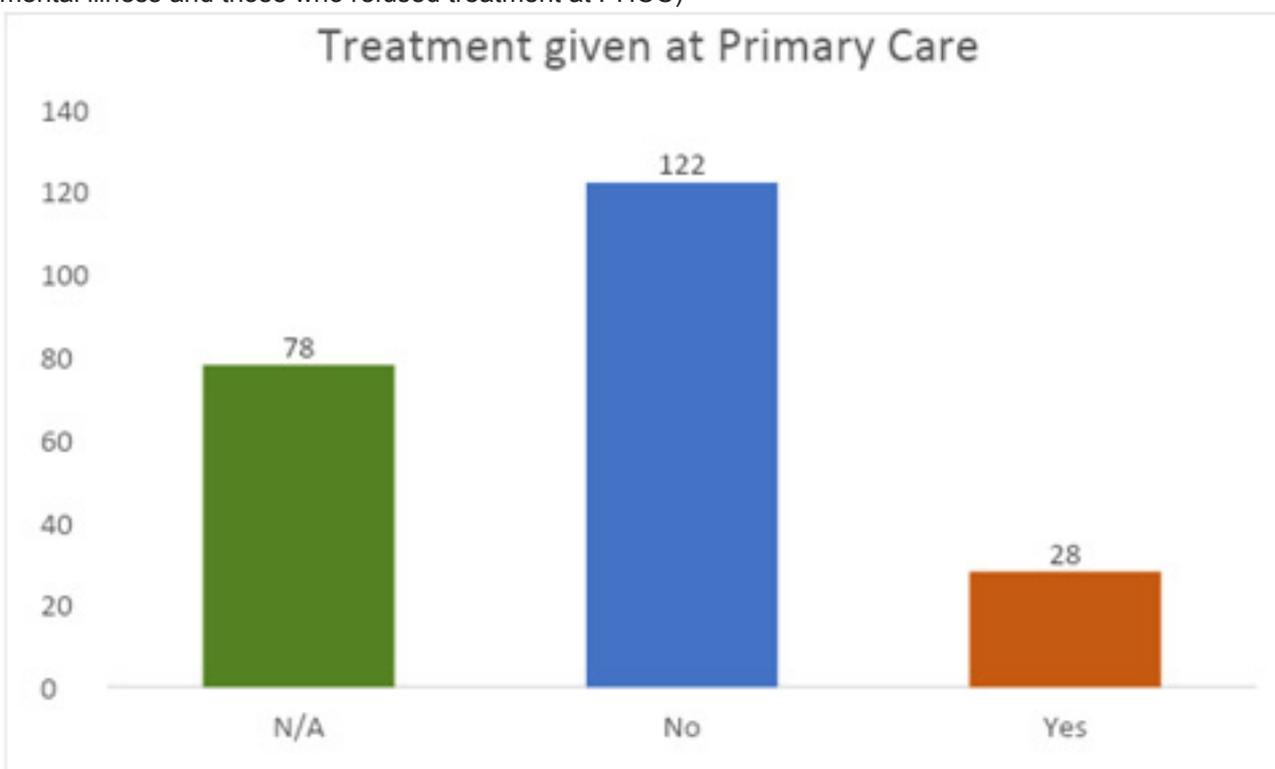
Table 3 shows the results for the seven-items checklist.

S.No	Seven-items Checklist	Results
1	History of presenting complaints	31%
2	Mental status examination	18.85%
3	Risk assessment	11.40%
4	Past medical / psychiatric history	16.20%
5	Psychiatric assessment tools	35.50%
6	Treatment given in the primary care setting	18.60%
7	Reason for referral	46.50%

Discussion

The evidence from previous studies elsewhere (14, 17) shows that the quality of mental health referrals to the hospitals is below a satisfactory level; this study shows that the quality of referrals in this sample are particularly bad and need addressing.

Some of the rates of referral component inclusion for this study are alarmingly poor, most notably information about mental state examination (18.86%) and risk assessment (11.4%). For any consultation involving a mental health problem, one would assume that mental status examination and risk assessment would be part and parcel of the referral. However, the results from the study point toward a disturbing trend: a profound lack of basic information in the referrals. Even the most important basic information forming the basis (history of presenting complaints and the reason for referral) for referral was not documented in more than half of the referrals (31% and 43%, respectively). Some referrals were single-worded referrals with no other supporting information, e.g., "Anxiety disorder" or "Depression".

It is not certain as to what are the exact reasons for the poor quality of psychiatric referrals in our study, but we know from the previous studies (18) that one of the factors may be the attitude of primary care physicians towards mental health care and the stigma and stereotypes of the "old school" approach. There is evidence that primary care physicians show unfavorable attitudes in assessing and having interactions with people presenting with mental health problems in primary care. (18). Another reason may be the disparity in knowledge and training of primary care physicians when it comes to dealing with mental health problems. A study by Kogan and colleagues (18) demonstrated the most prominent gap was visible in the knowledge of primary care physicians in managing substance use disorders and suicidality. This study also investigated the self-efficacy of the primary care physicians and showed that they lacked self-efficacy for detecting, treating and managing mental health problems in the community.

Although it was beyond the scope of this study to measure the impact of poor-quality referrals, it is known as per local data (here in Qatar) that nearly 20% of referrals, nearly one fifth, are being rejected (internal audit). This number could be even higher, had the psychiatry colleagues not taken extra precautions and effort by phoning the individual patients to get more information. This is not only unfair to the psychiatrists but also counterproductive for the health care system, where a lot of time and resources are spent on a task more efficiently performed at the primary care level.

This study highlights the need for formal training of primary care physicians to help in making appropriate mental health referrals, as well as reducing their gaps in knowledge, attitude and perception towards mental health care in the community. This study did not look into the demographics (age, gender, qualification and previous psychiatric training) of primary physicians, but future research projects can look into these aspects to identify and target areas for further improvement. One of the ways to improve the structure of referral letters is to introduce a template letter so that it prompts the referring physicians to include the important information at the time of referral.

Another very important question to ask at this stage is: what is the impact of the rejected referrals? Although this was not the aim of this study, the question, and its answer, can help improve care for patients, as well as reduce unnecessary burden on the system. One can safely say that by improving the quality of referral letters one can reduce the rejection in referrals, decrease delays in treatment and improve the quality of treatment delivery.

As per the Qatar national health strategy 2018 – 2022, "mental health and well-being" is one of the 7 priority focus areas. The target is to have improved mental health services, with 20% of those services being delivered to the community by primary care physicians. If this target is to be achieved, it is very important that primary physicians get further training in detecting and managing patients with mental health problems.

Summary

In this study, the author investigated the quality of psychiatric referrals made by primary care physicians in Qatar and found the referrals to have a significant lack of information related to all the clinical areas of mental health care. The author believes that this could be due to wider gaps in physician knowledge about mental health care and the perceptions of primary care physicians towards mental health care. There is a pressing need to address these issues and further research is required to investigate the

various causes of poor mental health referrals in order to improve the quality of care and improve the efficiency of the health system.

Note: The author would like to thank all the psychiatrists in Hamad General Hospital who participated in the completion of the survey for designing the seven-item checklist.

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Knowledge about inguinal hernia among the Saudi Population

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Abstract

Background: Inguinal hernias are the most common type of hernias and are a common health problem, which is most commonly treated surgically to avoid the risk of complications.

Aim: assessing the knowledge and awareness about causes, risk factors, and proper management of an inguinal hernia among the population of the Kingdom of Saudi Arabia (KSA).

Methods: A cross-sectional study was done from May to August 2017. 1,119 people participated in this study. The electronic online questionnaire was published through social media in all regions of Saudi Arabia. It consisted of socio-demographic data, Past medical and surgical history, Questions related to risk factors. Awareness score was calculated for all participants, depending on validated answers from many surgical international references to the answers chosen by the participants. The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) program version 21.

Results: 50.9% show a good awareness level, 45.3% of them were Saudi, those who were significantly younger p=0.000 with a mean age of 28 ± 9 compared with 49.1% show a poor awareness level (mean age 31 ± 11). Variables found to have a statistically significant relationship with awareness level were age, marital status, occupation, number of children and educational level (p=0.005).

Conclusion: The majority of participants in our study were not fully aware of the causes and management of a hernia. Age, marital status, education level, number of children and occupation play a significant role in their awareness. More educational programs about inguinal hernias are needed.

Key words: Inguinal hernias, Awareness, Knowledge, Saudi Arabia, Hernia.

Introduction

Hernias are a common public health issue; inguinal hernias are the most common among them. One of the most frequently performed operations worldwide is inguinal hernia repair [1]. A hernia is defined as a tissue, or an organ bulge or a protrusion through the weakened abdominal area. Although there are different types of hernias, they are usually related to the abdomen with approximately 75% of all hernias occurring in the inguinal region [2].

Regarding risk factors, males are more at risk to have an inguinal hernia than females [3]. Some patients who have suffered from an inguinal hernia on one side in the past tend to develop another on the other side; positive family history, obesity, and smoking are all known as potential risks for an inguinal hernia [1,4,5]. Multiple pregnancies in female patients and patients who are actively engaged in sport are at more risk to develop inguinal hernias, but they can occur in those who do not fit these categories [6,7].

The major cause of indirect hernias is congenital according to the age of the patient. They happen due to bulging of abdominal contents into an open processus vaginalis. In general, any conditions that contribute to increasing intra-abdominal pressure may be a risk for a hernia. Direct hernias occur due to weakness in the Hesselbach's triangle, especially the transversalis fascia [8].

Most important complications of an inguinal hernia are incarceration and strangulation [4,9]. Intraoperative complications are nerve injury of the vas deferens, blood supply of the testis, and hemorrhage. Early postoperative complications may be either local such as hematoma formation, scrotal swelling including testis and skin and primarily wound infection, or systemic such as respiratory and cardiac conditions [10].

Different approaches are used in the treatment and prevention of a hernia. These include truss, medications, and surgery. Surgery is the treatment of choice for hernia today; there are two main methods for surgery: open surgery and laparoscopy. Different methods are used in inguinal hernia repair, such as herniotomy which is defined as removal of hernial sac, and herniorrhaphy (herniotomy, with inguinal canal posterior wall repair). Tthis method is used for smaller hernias, indirect hernia, and for healthy tissues [11]. Hernioplasty (herniotomy, with posterior wall reinforcement) can be performed using a synthetic mesh which is used for larger abdominal defects. One of the most common inguinal hernia repair procedures is Lichtenstein tension-free mesh repair [12].

Hernia prevention can be achieved by preventing muscle weakness that allows a hernia to occur, cessation of smoking, avoiding a persistent cough, maintaining a healthy body weight, avoiding straining during urination or bowel movements, and avoiding lifting too heavy weights [13].

As Abdulwahab Alkhar's study revealed lack of public knowledge on the predisposing factors for hernia among the study group of young Saudis in Riyadh. Overall results showed that only 48% of the respondents could relate hernia to the key underlying risk factors while 22% denied the correlation and 30% claimed no knowledge of the risk factors, and the association with hernia development [14].

Studies concerning the knowledge of the population in the Kingdom of Saudi Arabia about hernia and its causes, management, and prevention have been reported rarely. So, the aim of this study was to assess the knowledge and awareness of the population about causes, risk factors and proper management of an inguinal hernia in the Kingdom of Saudi Arabia.

Methodology

Study setting and time frame: A cross-sectional study was conducted between May 2017 and August 2017.

Sampling methodology: The study was done to assess the knowledge and awareness of the Saudi population about causes, risk factors and proper management of an inguinal hernia in KSA. The inclusion criteria were Saudi, from all education levels, all regions and for adults from any age group, all genders, who live in KSA and have fluency in the Arabic language. There were no exclusion criteria. The target sample was at least 350 subjects from all regions of the Kingdom of Saudi Arabia (KSA). According to the response to the online survey, 1,119 responses were collected.

Study instrument: An open and close-ended structured questionnaire was administered to the public as an electronic copy through Social media. We put open questions for age, weight and height to calculate the body mass index (BMI), close-ended questions included multiple choice for risk factors, causes, complication, management, and prevention with most common answers with the ability to select more than one answer, to assess the knowledge and awareness of population. The questionnaire included filter questions to the persons who had a history of hernia.

Each questionnaire had four sections comprised of the person's demographic information, past history, diagnostic criteria, and symptoms and signs, followed by the knowledge and awareness section. The questionnaires provided information about the past history of persons, assessed the most common risk factors widespread in the sample, determined the most common symptoms of hernias, what are the causes of the hernia from their point of view, determined the type of management, whether drug management or non-drug management and which type of management would be used if they had a hernia and the most common complications in their opinions. Finally, to determine the most effective preventive method in their point of view.

Statistical analysis: Data were analyzed by a biostatistician using Statistical Package for the Social Sciences (SPSS) program version 21 developed by International Business Machines (IBM®) Corporation. Statistical tests were descriptive analysis where quantitative data was expressed as mean and standard deviation (Mean ± SD), and qualitative data were expressed as numbers and percentages, and the Chi-square (χ2) test was used to test the relationship between variables. A p-value of <0.05 was considered as statistically significant.

Results

This study was applied on 1,119 subjects from the Saudi population during the period between May 2017 and August 2017. Most of them were females 874 (78.1%) and 245 (21.9%) were males and the mean age of the participants was (29 ± 10 years). The age and other Socio-demographic data of participants are summarized in Table 1. Different educational levels were noticed in the participants of our research, most of them were university graduated 845(76.3%).

According to the questionnaire given to the participants, 50.9% showed a good awareness level and they were significantly younger (p=0.000 with a mean age of 28 ± 9) compared with 49.1% who showed a poor awareness level (mean age 31 ± 11) (Figure 1). Socio-demographic data of both are shown in Table 2. Variables found to have a statistically significant relationship with awareness level were age, nationality, residency, marital status, occupation (p=0.000), and educational level (p=0.004). No significant difference in awareness level was noticed between male and females who participated in this study.

About 79 % of all participants in our research thought that they are not fully aware and oriented about causes, management, and prevention of a hernia, and they suggest more educational programs to the Saudi population about this common health problem. Most statistically significant questions found to affect the awareness level were those about causes of a hernia; both who had a good and poor awareness level chose abdominal muscles weakness as a most common cause of a hernia (625(18.8%) of our participants), while the rest most commonly chose causes are weight lifting sports, pregnancy, and delivery, abdominal surgeries, respectively; other causes are shown in Table 3. Most of the participants chose pain in the affected area as the most common presenting complaint, while the most participants chose treatment of choice is surgery in 803(71.8%); other chosen symptoms and treatments are shown in the same Table.

Awareness of treating hernia by surgical mesh was noticed in 506 (45.2%) of participants, and to assess the knowledge and awareness of hernia prevention we allowed participants to choose more than one method of prevention which is shown in Table 3.

Discussion

Population knowledge, perceptions, and views must be elicited to provide appropriate prevention methods, as hernia complications are considered life-threatening conditions. In this study, 50.9% of our participants are fully aware of hernia causes, management, and prevention. Age, marital status, educational level, occupation, number of children and frequency of pregnancy were significantly associated with awareness level.

The relation between awareness level and the age of participants was significant in our study. 23.2% who have good awareness level were between 18-24 years old; this may be because we included university students most. In another study which aimed to assess the awareness of females about breast cancer, they found that younger women had higher scores in relation to other participants [15].

In our study, we observed that there is a significant relationship between good awareness and marital status and we found that 26.5% of participants who had good awareness level were singles. Another study conducted in Jeddah to assess the awareness about breast cancer found that single females had better knowledge than others [16].

There is a significant relationship between awareness level and education; 39.5% who had a good awareness level were highly educated. Another study that aimed to assess the knowledge of Breast cancer showed that women with Low education level seem to be associated with poor awareness level about breast cancer which inversely influenced their breast cancer screening behaviors (15). Other research conducted in Al-Qassim region about diabetes mellitus knowledge showed an association between level of education, and awareness of DM [17].

Our result showed that field workers (health care) who havda good awareness level (124, 11.1%) was higher than non-field workers (70, 6.3%). While the field worker did noy have a better awareness level compared to the unemployed who had a good awareness level (376,33.6%). This can be accounted for by the fact that the majority of our sample where unemployed (675 out of 1119). This is consistent with Ahmad Alakeel research (2017), where their sample was students and unemployed (367, 36.4%), (273, 27.1%) respectively [18].

In our study we observed that there is a significant relation between good awareness level and number of children. Those who have no children had a   higher awareness score than others (218, 23.6%). That is because 46% of the participants were single and as we discussed before 26.5% have a good awareness level score. To our knowledge, no previous research has studied the relationship between number of children and the awareness level about hernia. In contrast, previous research done about awareness of parents about antibiotic use among children in Riyadh, found no significant differences in awareness level

Table 1: Sociodemographic data (n = 1119)

Variables		n	%
Age groups (years)	18-24	467	41.7%
	25-39	393	35.1%
	40-59	211	18.9%
	<18	43	3.8%
	+60	5	0.4%
Age (Mean ± SD) *			29 ±10
Gender	Female	874	78.1%
	Male	245	21.9%
Nationality	Saudi	995	88.9%
	Non-Saudi	124	11.1%
Residency	Middle	316	28.2%
	North	301	26.9%
	West	250	22.3%
	East	141	12.6%
	South	111	9.9%
Marital status	Married	568	50.8%
	Single	524	46.8%
	Divorced	19	1.7%
	Widow	8	0.7%
No. of children	None	409	44.2%
	<4	277	29.9%
	4-6	204	22.1%
	>6	35	3.8%
Education level	University	845	76.3%
	Secondary school	191	17.2%
	Higher education	41	3.7%
	Less than secondary school	31	2.8%
House Type	Apartment	439	39.9%
	Old house	77	7.0%
	Villa	585	53.1%
Occupation	Unemployed	675	60.3%
	Field work	269	24.0%
	Non-field work	175	15.6%

Figure 1: Awareness level about hernia among the participants (n= 1119)

Awareness level about hernia (*n*=1119)
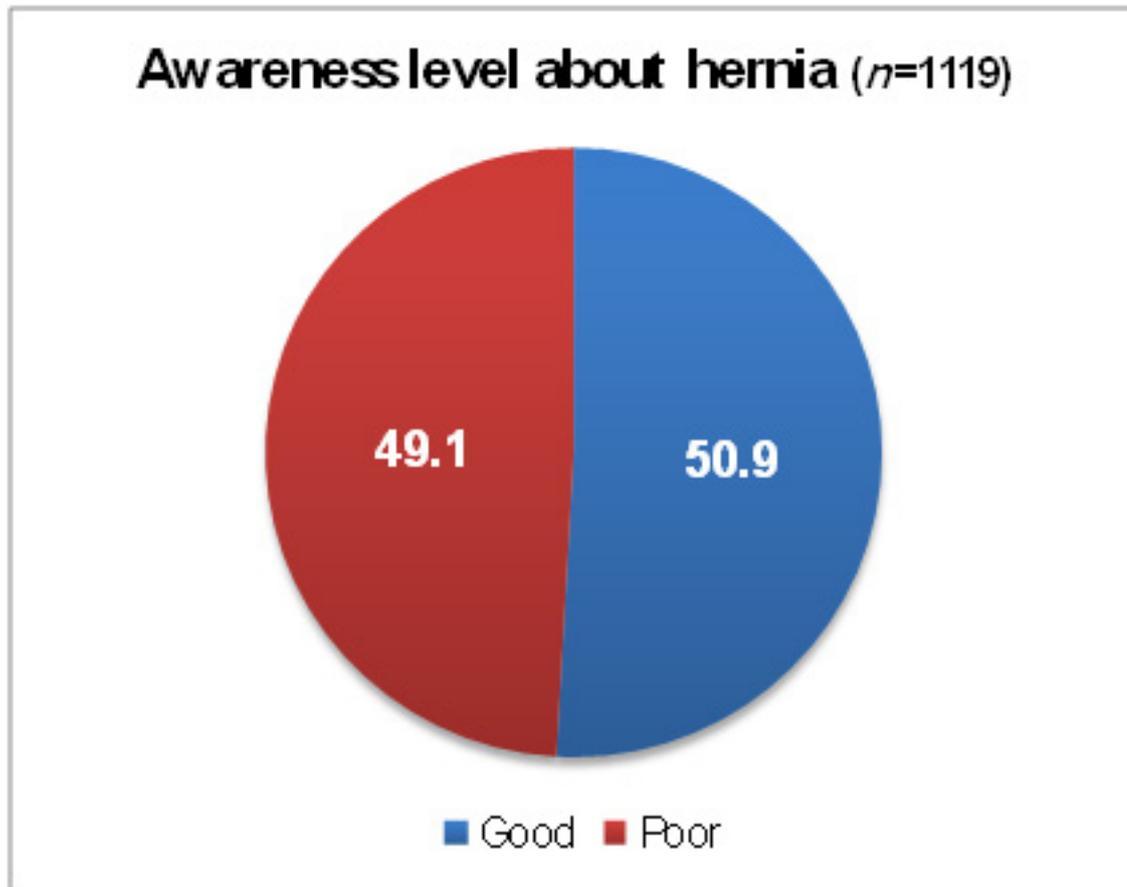
Good ■ Poor

Table 2: Relationship between awareness level and sociodemographic data (n = 1119)

Variables		Awareness level				P. value
		Good		Poor		
		n	%	N	%	
Age groups (years)	18-24	260	23.2%	207	18.5%	0.002[†]
	25-39	201	18%	192	17.2%	
	40-59	88	7.9%	123	11%	
	<18	21	1.9%	22	2%	
	+60	0	0%	5	0.4%	
Marital status	Married	261	23.3%	307	27.4%	0.004[†]
	Single	297	26.5%	227	20.3%	
	Divorced	9	0.8%	10	0.9%	
	Widow	3	0.3%	5	0.4%	
No. of kids	None	218	23.6%	191	20.6%	0.005[†]
	<4	135	14.6%	142	15.4%	
	4-6	89	9.6%	115	12.4%	
	>6	9	1%	26	2.8%	
Education level	University	438	39.5%	407	36.7%	0.008[†]
	Secondary school	105	9.5%	86	7.8%	
	Less than secondary school	7	0.6%	24	2.2%	
	Higher education	19	1.7%	22	2%	
Occupation	Unemployed	376	33.6%	299	26.7%	0.000[†]
	Field work	124	11.1%	145	13%	
	Non-field work	70	6.3%	105	9.4%	

Table 3: Response of the studied participants to the questionnaire items about hernia (n = 1119)

Variable		n	%
What are the causes of the hernias in your opinion?	Abdominal muscles weakness	625	18.8%
	Weight lifting sports	464	14.0%
	Pregnancy and delivery	438	13.2%
	Abdominal surgery	388	11.7%
	Congenital	371	11.2%
	Obesity	351	10.6%
	Chronic constipation	313	9.4%
	Chronic cough	247	7.4%
	Smoking	123	3.7%
Do you think that surgery has a role in causing the hernia?	Yes	640	57.2%
	No	479	42.8%
What do you think is the treatment of choice for the hernia?	Surgery	864	77.2%
	Lifestyle modification	200	17.9%
	Medications	55	4.9%
What do you think is the complication after treating the hernia surgically?	Recurrence	406	36.3%
	None	283	25.3%
	Inflammation of the incision	247	22.1%
	Chronic pain or uncomfortable feeling in the affected area	183	16.4%
Have you heard that inguinal hernia repair is better to be done by surgical mesh?	Yes	570	50.9%
	No	549	49.1%
For prevention of the hernia	Lifting the subjects in right way	821	44.5%
	Go to doctor if have one or more of (cough, dysuria, constipation, swelling of abdomen or part of it)	807	43.7%
	Stop smoking	219	11.9%
Do you think that there is enough awareness about the prevention and management of hernia?	No	957	85.5%
	Yes	162	14.5%
Awareness level	Good	570	50.9%

found no significant differences in awareness level regarding the number of children (p-value > 0.05) [19]. Another study attempted to assess awareness level of parents of children with disabilities about human rights of their children and found that the number of children in the family has an impact on awareness level of the parents with children with disability. Parents having two children are more aware compared with other parents. Further, parents having more than three children are found to be least aware [20].

The majority of participants agreed that abdominal muscle weakness is the most common cause of hernia while smoking was the least likely chosen cause. A Comprehensive Review about Etiology of Inguinal Hernias done in 2017 showed that high intra abdominal pressure (as in coughing, straining and jumping) [21], old age, male gender, connective tissue disorder, patent processus vaginal, are risk factors for developing a hernia. It also showed that higher BMI is a protective factor for a hernia and it showed that smoking is not confirmed to be a risk factor for developing an inguinal hernia.

Regarding heavy lifting as a risk factor for developing hernia, research done in 2015 mentioned that its remains controversial. A recent systematic review showed data concerning the relationship between repeated heavy lifting, occasional heavy lifting, or a single strenuous lifting episode and the development of a groin hernia to be inconclusive [22]. Of note, there is no increased incidence of inguinal hernias in weightlifters [23]. While it includes other risk factors for inguinal hernias: family history and previous hernia.

In our research, we discussed whether surgery has a role in causing a hernia. The majority of participant answered yes (640 = 57.2%). Other studies include, low surgical volumes, surgical inexperience, poor surgical techniques, peritoneal dialysis and history of open appendectomy as risks for IH [24].

Regarding surgical complications the most common chosen complication in our study was recurrence. Other complications included chronic pain in the area, infection, and inflammation of the incision. Other studies include complications as hematoma or wound seroma, wound infection (4), testicular complications [25], and complications related to the mesh, for example, erosion, infection, and contraction.

In our study (570=50.9%) of participants thought that mesh repair is better to be used in hernia surgery. A Cochrane meta-analysis done in 2002 compared mesh repair without mesh repair and strongly supported the superiority of prosthetic mesh repairs over sutured repairs, reporting a 50 to 75% lower risk of hernia recurrence, an earlier return to work and a lower risk of chronic post-herniorrhaphy groin pain [26].

Based on IH prevention, (821=44.5%) of participants think that lifting objects in a correct way is a safer and effective way to prevent IH and least preventive method chosen by both was smoking cessation. Based on another review, IH cannot be prevented in patients who are physically demanding [27], in which risk will decrease after repair [28].

Limitations
Limitations of our study could be the difficulty of generalizing our findings, as the target population didn't cover the whole Saudi population as it was an online survey.

Conclusion

In conclusion, according to the participant's knowledge, the most common causes are abdominal muscle weakness and the commonest risk factors are previous abdominal surgery, and overweight. More than half of the participants believe surgical intervention is the treatment of choice. The majority of participants in our study were not fully aware of the causes and management of a hernia. This indicates their need for educational programs about a hernia.

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Predictors of Pediatric Intensive Care Unit admissions among Children with Acute Asthma Exacerbation

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Abstract

Introduction: Asthma is a common chronic childhood respiratory disorder characterized by episodes of acute shortness of breath, cough, and wheezing that are due to chronic airway inflammation. The present study aimed to investigate the predictors of Pediatric Intensive Care Unit (PICU) admission among 2–12 years old children with exacerbated asthma.

Materials and Methods: This retrospective chart review study was approved by the institutional review board at Abha Maternity and Children Hospital, Saudi Arabia. Children were also enrolled if the parents reported previous use of inhaled corticosteroids for asthma control therapy. The diagnosis of asthma was confirmed by either a pediatric allergist or a pulmonologist who was actively involved in inpatient and outpatient asthma care.

Results: Of the 128 patients enrolled in the study, 31 required PICU admissions. No statistically significant difference was detected between age and age categories (<3, 3–6, and >6 years) in children admitted to the pediatric ward and PICU. Children who had previous PICU admissions, one, two, and three times have high odds of being admitted to the PICU during the current asthma exacerbation. These odds did not change after adjusting for the gender, prevalence of food allergy, previous inhaled corticosteroid (ICS) use, and age. Independent of age, gender, and previous use of ICS, previous PICU admissions and emergency department (ED) triage peripheral capillary oxygen saturation (SpO2) are statistically significant factors to predict the current PICU admissions required for children with acute asthma exacerbations between 2 and 12 years of age.

Conclusion: Previous PICU admissions and SpO2 measurements at the emergency department (ED) are independent predictors of needing intensive care admission for children between 2 and 12 years of age with acute asthma exacerbation. Nevertheless, further studies are needed to explore additional modifiable predictors that could help in identifying children with a high risk for intensive care admissions.

Key words: Children, Asthma Exacerbation, Pediatric Intensive Care Unit

Introduction

Asthma is a common chronic childhood respiratory disorder that is characterized by episodes of acute shortness of breath, cough, and wheezing attributed to chronic airway inflammation (1). Despite improvements in asthma care and the availability of medications that control the symptoms and prevent exacerbations, asthma continues to have a significant financial impact on the health care systems (1–3). In a recent report from the USA, the estimated direct cost of childhood asthma in 2018 was more than USD 6 billion and has increased as compared to the previous reports (3,4). The study also estimated that the cost of asthma-related ED visits was more than USD 300 million (3,5). Most of the asthma-related costs are due to acute flare-up hospitalizations and emergency department (ED) visits. In Saudi Arabia, the recent national asthma guidelines stated that the prevalence of childhood asthma has increased, which in turn, elevates the cost of treatment (1)(6).

Despite limited nation-wide and standardized prevalence studies among Saudi children, several cross-sectional studies, conducted in different regions, estimated a prevalence of asthma between 9 and 33% (7–11). Frayh conducted a cross-sectional study in three different regions of Saudi Arabia on randomly enrolled >1500 school-age children (>6 years), and reported the highest prevalence (33%) of asthma among children living in the Eastern region (Hofu city) and the lowest (14%) in the Western region (Jeddah city) (7). Alahmadi et al. published an extensive systematic review about the asthma prevalence studies conducted in Saudi Arabia and proposed a standardized nation-wide survey that measures the real and accurate prevalence and impact of this common disease (11). Consequently, the health care systems of the Kingdom could target the regions that have a high prevalence of uncontrolled asthma and implement programs to emphasize the understanding of this disease and its complications.

Based on local and international reports, asthma-related pediatric intensive care admissions have increased (12,13). Hartman et al. reported three folds increased admissions in Pediatric Intensive Care Unit (PICU) over a period of 15 years in New Jersey (USA)(13). In Saudi Arabia, a more recent study published in 2013 showed four folds increase in PICU admissions compared to prior cohorts in 2003 (12). Despite the increase in PICU admissions among asthmatic children, modifiable risk factors for PICU admissions are lacking. Thus, the present study aimed to evaluate the predictors of PICU admissions among children with asthma exacerbation between 2 and 12 years of age.

Materials and methods

This retrospective chart review study was approved by the institutional review board at Abha Maternity and Children Hospital (AMCH), Saudi Arabia.

Study subjects and setting
Children aged 2–12 years, suffering from asthma exacerbation as per the emergency pediatrician evaluation, were enrolled in the present study. Children were also enrolled if the parents reported previous use of inhaled corticosteroids for asthma control therapy. The diagnosis of asthma was confirmed either by a pediatric allergist or a pulmonologist who was actively involved in inpatient and outpatient asthma care. The study period was July 2018–December 2019. After the list of patients was made, comprehensive chart reviews were conducted for the extraction of the study variables. Children <2 years old were excluded since the viral-induced wheezing phenotypes are prevalent among this age group and can be misdiagnosed as asthma.

The present study was conducted at the inpatient pediatric department of AMCH. The hospital has 50 active inpatient bed capacity and is located in the southwest region of Saudi Arabia. Also, it has a separate section of pediatric allergy and pulmonology medicine with three active board-certified physicians (two pediatric pulmonologists and one allergy immunologist).

Study variables
The data collection sheet consisted of three sections: pre-hospital clinical and demographic variables, emergency room clinical variables, and current admission clinical and laboratory variables. Pre-hospital clinical and demographic variables include age, gender, age at first wheezy episode, ED visits and admissions in the last year, food allergies, previous inhaled corticosteroid (ICS) use, duration of illness before coming to the ED, and previous PICU admissions. The emergency room clinical variables include initial ER vitals (O2 saturation, temperature, weight, and chest auscultatory findings) and chief complaints (cough, fever, and wheezing). Also, the ED acute management was recorded. The last section of the datasheet included inpatient antibiotics use, whether or not the patient needs PICU admission, complete blood count (CBC), erythrocyte sedimentation rate (ESR), and the total length of hospital stay (LOS).

Statistical analyses
Statistical analyses were performed using Stata version 14 (StataCorp, College Station, TX, USA). Data for normally distributed variables were represented as mean and SD and as median with interquartile range for non-normally distributed variables. The categorical variables were represented as counts and percentages. T-test and two-sample Wilcoxon- rank-sum (Mann–Whitney) tests were used for continuous variables to test the variable differences among patients admitted to PICU and the general pediatric ward. Fisher's exact test and chi-square test was used to study the differences between categorical

variables. The unadjusted odds ratios (OR) were calculated for the statistically significant variables using bivariate logistic regression, and the adjusted OR were calculated based on the multivariate logistic regression model after adjusting for gender, prevalence of food allergy, previous ICS use, and age. P-value <0.05 was used to determine the statistical significance.

Results

Baseline characteristics of the patients
A total of 128 patients were enrolled in this study. Of these, 31 patients (24%) required PICU admissions. The enrolled patients were 2–12 years (mean, 5±2.6). No statistically significant differences were detected between the age and age categories (<3, 3–6, and >6 years) with respect to children admitted to the pediatric ward and PICU (Tables 1 and 2). Around one-third of the cohort was comprised of females, 47/128 (37%), and male predominance was 65% and 58% in the pediatric ward and PICU admissions, respectively. The majority of the hospitalizations were during winter and autumn months with the lowest during summer: 46%, 36%, and 6% respectively. Previous PICU admissions were statistically significant between the two groups (p=0.02). Less than one-fifth of the total cohort was followed up in the outpatient clinic the previous year (20/128, 15%). Interestingly, the patients' current or previous history of food allergy did not differ significantly between the two groups. Furthermore, 17/31 (55%) of the PICU admitted patients were hospitalized at least once in the previous year. Emergency visits in the previous year were prevalent in pediatric ward 87/97 (90%) and PICU admissions 30/31 (97%), respectively. The previous ICS use was observed in about half of the subjects in both groups while the use of ICS in the last four weeks before the current illness was in only 4/128 (3%). More than 90% of the patients received systemic steroids at the ER before hospitalization. Dexamethasone was the commonly used type of steroid in 67/128 (58%). The two commonly reported chest X-ray findings were pneumonic consolidations and hyperinflations: 36/118 (30%) and 82/118 (69%), respectively. All patients received antibiotics. Azithromycin was the commonly used antibiotic in 109/128 (85%), followed by cefuroxime for patients 78/97 (80%) admitted to the general ward and ceftriaxone in 19/31 (61%) requiring PICU admission (Table 1).

SpO2 at the ED triage was statistically significant between the two groups: 85±4 for general pediatric admissions and 82±3.9 for PICU admissions (p=0.01) (Table 2). The white blood cell counts and sodium levels did not differ between the two groups. Also, the potassium levels did differ significantly from those admitted to the general ward compared to PICU admissions (means: 3.7±0.75 and 4.1±0.99, respectively, p=0.03). The mean LOS for PICU patients was 7±2.53 days, which differed significantly as compared to that for the general pediatric admissions (p<0.001). Most of the enrolled asthmatic children 79/128 (62%) had their first wheeze episode before the first birthdays, and the median duration of the current illness was two days. The temperature levels and other laboratory parameters, such as neutrophils, eosinophils, lymphocytes, glucose, and ESR did not differ between the two groups (Table 2).

Predictors of PICU admission
Children who were previously admitted to the PICU one, two, and three times had high odds of being admitted to the PICU during the current asthma exacerbation (1.38, 3.8, and 15.3, respectively). However, these odds did not alter after adjusting for the gender, prevalence of food allergy, previous ICS use, and age, and statistically significant odd ratios were detected for those who had ≥3 previous PICU admissions (OR: 13.7, 95% confidence interval (CI): 1.3–139, p=0.040) (Table 3). In addition, those who received steroids at the ED had high odds of being admitted to the PICU; however, the significance disappeared after adjusting for the covariates (p=0.32). Nevertheless, statistically significant differences were detected between SpO2 levels among children who were admitted to PICU as compared to those admitted to the general pediatric ward (Table 2). Strikingly, for each unit increase in the SpO2, is a 0.89-fold increase in the odds of being admitted to the PICU (OR 0.89, 95% CI: 0.80–0.99, p=0.03; Table 3). Also, the OR for being admitted to PICU increased with the number of previous PICU admissions (Figure 1).

Discussion

The present study demonstrated the importance of previous PICU admissions and SpO2 measurements at the ED triage as predictors of PICU admissions in children with acute asthma exacerbation. The odds of PICU admissions increased with a high number of previous PICU admissions. This phenomenon emphasizes the importance of history and initial vital signs in the ED in any child with acute asthma exacerbation. Irrespective of age, gender, and previous use of ICS, previous PICU admissions and ED triage SpO2 are statistically significant factors to predict current PICU admissions for children aged 2–12 years, with acute asthma exacerbations.

Paniagua et al. reported the importance of emergency room O2 saturation level <94% as an independent predictor for general ward and PICU admissions with odds of 5.2 and 4.6, respectively (14). However, a previous study by Keahey et al. did not support using SpO2 as the only predictor for hospital admission in children with acute asthma exacerbation (15). Furthermore, the likelihood ratios for different cut off points were calculated, and it was found that patients who had had the initial room air SpO2<88% had more than 10 likelihood ratio LR of requiring hospitalizations, but few patients presented with low SpO2 (15). In addition to the importance of ED SpO2 for the prediction of PICU and general ward admissions, the LOS in the emergency room was also estimated (OR 4.6, 95% CI: 4.1–5.2). The LOS cutoff was >3 h, as this was the estimated time for stabilization, initial treatment, and assessment of the response. The current cohort showed SpO2 was <92%, and all children were admitted to the hospital; nonetheless, those who had low SpO2 (mean,

Table 1: Demographic characteristics (categorical variables) of the patients admitted to the general pediatric ward and pediatric intensive care unit (PICU) (n=128)

Variables[1]	Total N=128		Pediatric ward n=97		PICU n=31		P- value[2]
	N	%	N	%	N	%	
Age <3, years	48	38%	37	38%	11	35%	0.58
Age 3-6, years	39	30%	31	32%	8	26%	0.52
Age >6, years	41	32%	29	30%	12	39%	0.72
Gender, female	47	37%	34	35%	13	42%	0.45
Season at time of Hospitalization:							
- Winter	59	46%	48	50%	11	36%	
- Spring	15	12%	9.0	9.0%	6.0	19%	0.28
- Summer	8	06%	5.0	5.0%	3.0	10%	
- Autumn	46	36%	35	36%	11	35%	
Previous PICU admission	22	17%	13	13%	9.0	29%	**0.02**
Follow up clinic last year	20	15%	13	13%	7.0	23%	0.22
History of food allergy	20	15%	16	17%	4.0	13%	0.63
Hospitalization last year	63	49%	46	49%	17	55%	0.47
ER visit last year	117	91%	87	90%	30	97%	0.22
ICS use ever	62	48%	45	46%	17	54%	0.41
ICS use last 4 weeks	4.0	3.0%	3.0	3.0%	1.0	3.0%	0.97
Steroid use at ER triage:							
- Dexamethasone	67	58%	54	62%	13	45%	
- Prednisolone	24	21%	21	24%	3.0	10%	
- Hydrocortisone	5.0	4.0%	2.0	2.0%	3.0	10%	**0.007**
- Methylprednisolone	10	8.0%	4.0	5.0%	6.0	21%	
- Did not receive steroid	10	8.0%	6.0	7.0%	4.0	14%	
Chest x-ray finding (abnormal):							0.11
- Pneumonic consolidation	36	30%	25	28%	11	38%	
- Hyperinflation	82	69%	65	72%	17	59%	
Antibiotics use during admission:							
- Azithromycin	109	85%	80	82%	29	94%	
- Cefuroxime	89	81%	78	80%	11	35%	0.57
- Ceftriaxone	34	32%	15	15%	19	61%	
- Vancomycin	9.0	8.0%	02	02%	07	23%	
Referral to Allergy/Pulmonology service			128	100%			

1 These variables are reported as a proportion, n (%).
2 P value was derived by Chi-square or Fisher's exact test for categorical variables.

Table 2: Demographic characteristics (continuous variables) of the patients admitted to the general pediatric ward and pediatric intensive care unit (PICU) (n=128)

Variables (normally distributed)[1]	Total N=128 Mean (SD)	Pediatric ward n=97 Mean (SD)	PICU n=31 Mean (SD)	P-value[2]
Age	5 (-/+2.6)	4.9 (-/+2.6)	5.4 (-/+2.6)	0.31
SpO2 at ER triage	84 (-/+4.2)	85 (-/+4)	82 (-/+3.9)	0.01
White blood cell count	9.9 (-/+4.2)	9.8 (-/+4.3)	10 (-/+3.8)	0.71
Potassium level	3.8 (-/+0.83)	3.7 (-/+0.75)	4.1 (-/+0.99)	0.03
Sodium level	132.8 (-/+20.8)	133 (-/+19.5)	131.6 (-/+24.7)	0.71
Length of Stay	5.24 (-/+2.20)	4.68 (-/+1.76)	7 (-/+2.53)	<0.001
Variables (non-normally distributed)[1]	Median (25th-75th quartiles)	Median (25th-75th quartiles)	Median (25th-75th quartiles)	
Age at first wheeze episode	12 (8-24)	12 (8-24)	12 (9-24)	0.65
Days of illness	2 (2-3)	2 (2-3)	3 (2-3)	0.75
Temperature at ER triage	37 (36.2-37.3)	37 (36.02-37.7)	37 (36.7-37)	0.84
Weight	16 (13-22.2)	16 (12.5-21.8)	17.65 (14-25)	0.23
Neutrophils count	77 (61-87)	76 (58-87)	78 (68-87)	0.18
Lymphocytes count	16.7 (9-29)	20 (9-33)	14 (8-23)	0.22
Eosinophil count	0.0 (0-1)	0.1 (0-1.2)	0.0 (0.0-0.5)	0.26
Glucose level	110 (92-143)	116 (94-172)	106 (88-113)	0.07
Erythrocyte Sedimentation rate	22 (11-35)	24 (12-35)	19.5 (6.5-32.5)	0.34

1 These variables are reported as mean -/+ SD.
2 P value was derived by a t-test for normally distributed continuous variables and by Wilcoxon Rank for non-normally distributed variables.

Table 3: Predictors of pediatric intensive care admissions

Predictors	Crude ORs (95% CI)	Adjusted ORs (95% CI)[1]	P-value[2]
Previous PICU admissions:			0.040
- 1 previous hospitalization	1.38 (0.4 to 4.7)	1.6 (0.4 to 6.2)	
- 2 previous hospitalization	3.8 (0.2 to 63)	3.8 (0.2 to 73)	
- 3 previous hospitalization	15.3 (1.6 to 143.6)	13.7 (1.3 to 139)	
Steroid use at ER triage	1.50 (1 to 2.2)	1.44 (0.96 to 2.1)	0.32
SpO2 at ER triage	0.88 (.81 to 0.98)	0.89 (0.80 to 0.99)	0.03

Figure-1: Odds of current PICU admissions associated with previous PICU admissions
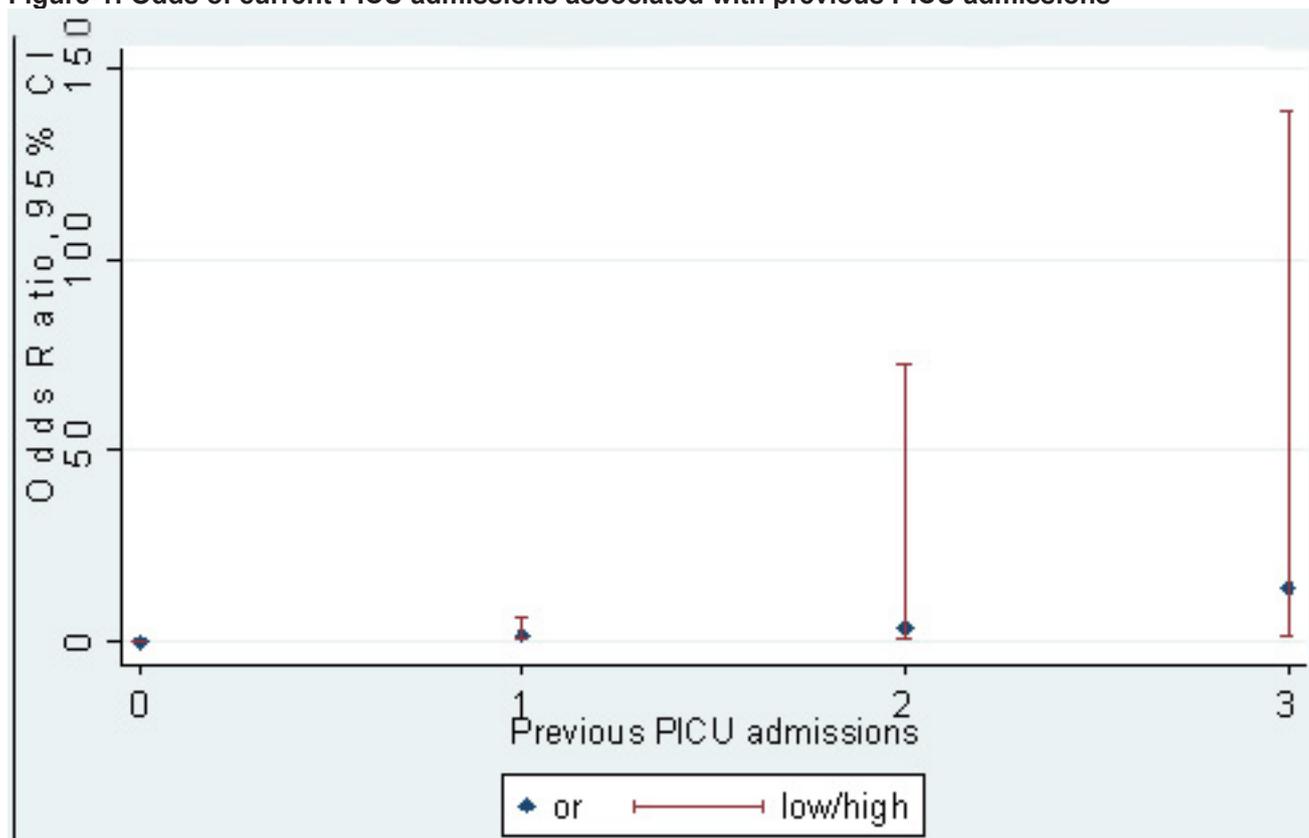
82±3.9) were admitted to the PICU. Several studies have used the initial SpO2 measurements as one of the asthma severity score elements, which support the importance of initial ER vital signs for the patients' disposition (16–18). Another study recommended the use of SpO2 as the fifth vital sign in any pediatric emergency as it aids in the clinical decisions and disposition of the patient (19).

Earlier hospitalization either in PICU or general ward has been reported as a significant risk factor for current PICU admission (20,21). A systematic review encompassing more than 40 years of adult asthma-related studies reported similar results (OR=5.14, 95% CI: 1.91–13.86, p=0.001) (22). In the current study, children who required PICU had high odds of being admitted previously to the PICU, which increased with additional PICU admissions. The odds were statistically significant for those with three previous admissions, even after adjusting for covariates (age, gender, presence of food allergy, and previous use of ICS). Al-Shehri et al. reported that previous PICU and neonatal intensive care had a 344% and 96% higher readmission rate, respectively, compared to children who did not have previous intensive care admissions (23). Given the current and previous findings, children who had previous PICU/general ward admissions had high odds of needing PICU admissions.

Since the high cost of asthma treatment is primarily due to acute exacerbations and hospitalizations, multidisciplinary asthma care is recommended to enhance the education and early interventions for asthma flare-up. These programs should be targeted to children with severe and moderate asthma and those who have been previously admitted to PICU.

Conclusion

Previous PICU admissions and the SpO2 measurements at the ED are independent predictors of needing intensive care admission for children with acute asthma exacerbation, aged 2–12 years. Further studies are needed to explore the modifiable predictors that would help in identifying children with a high risk for intensive care admissions.

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The survey of primary care physicians regarding attitude, confidence and knowledge in providing mental health care in Qatar

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Abstract

Background: In Qatar, the enormous cost of mental health disorders has spurred a primary care-driven national strategy to improve mental health treatment access. However, attitudes, confidence and knowledge about mental health treatment can widely vary in the Qatari primary care physician population, which can have significant implications for the quality of mental health treatment delivery. We know of no published data on these characteristics.

Materials and Methods: We collected anonymous surveys from primary care physicians working in the Primary Health Care Corporation (PHCC). The survey collected demographic data about the respondents, and used the well-validated Mental Illness: Clinicians' Attitude Scale (MICA-4) to assess attitudes and confidence about mental health treatment, as well as a knowledge assessment tool developed locally.

Results: There were 115 respondents, most of whom were male (67%) and aged 36-55 (80.4%). Most respondents (75.7%) had less than two years of psychiatric training or experience, and had taken two or fewer psychiatric education courses in the last year (83.4%).

Most of the physicians expressed positive attitudes about mental health and confidence about treating it. Although respondents lacked in the mental health knowledge when judged against the local policies, they showed good fundamental knowledge of diagnosing and treating common mental health problems. The majority of the physicians chose SSRIs (citalopram, fluoxetine, paroxetine) as first line treatment of depression (81%) and anxiety (90%). However, they could not identify the proper protocol to manage SSRI-induced hypomania (76.5%). They did identify the importance of thyroid function screening (87.8%) and evidence-based non-pharmacological treatment (71.3%).

Conclusion: Primary care physicians in Qatar are willing to treat mental health conditions and feel confident about doing so. They have good fundamental knowledge but appear to lack knowledge of local (PHCC) policies about managing common mental health conditions.

Limitations: Study limitations include the use of subjective survey data and use of a knowledge assessment tool validated solely by local expert consensus.

Key words: primary care, psychiatry, mental health treatment, quality improvement, mental health care, Qatar

Introduction

Mental health conditions make up about one-third of the total adult disability burden worldwide (1,7). In 2017, estimates show that 970 million people — one out of every eight people — were diagnosed with either a mental health condition or a substance use disorder (8). The economic and social costs of mental health conditions far exceed that of any other category of illness (17). Personal costs of mental illness are also massive: in high-income countries, 90% of suicidal deaths can be attributed to mental health or substance use disorders (8). These alarming numbers show no signs of stopping, as an increasing number of adolescents admit to having mental health problems. Suicide remains the leading cause of death in this age group (2).

Primary care physicians are tasked with the vast majority of the treatment responsibility for mental health conditions. According to a World Health Organization (WHO) study, about one-third of primary care consultations are requested to treat mental health conditions (1). Primary care physicians assume the majority of responsibility for the treatment of depression and anxiety. For most primary care physicians worldwide, they are expected to be the first and most heavily utilized treatment providers for mental health care.

When primary care physicians are involved in mental health care treatment, research shows that treatment outcomes improve (11, 12, 13). Such data supports the notion that early intervention is highly beneficial for those with mental health conditions, despite differences in knowledge and experience between mental health specialists and primary care physicians. There are several distinct advantages to mental health treatment from a primary care physician. Treatment in this setting is accessible, affordable and acceptable to patients and their families (3). Compared to the specialist mental health services, there is less risk of stigma with primary care management of mental health problems (4).

Qatar launched its own national mental health strategy in 2013 where it set out its vision for mental health treatment in the country (5). The main aim of this strategy is to ensure that there is provision of good mental health care for the people of Qatar — care that is supported by integrated mental health services with access to the right treatment, at the right time and at the right place. Primary care is the core of integrated mental health care. This treatment model is in line with the vision of the WHO, which also encourages the provision of integrated mental health care that is both accessible and free from stigma.

Primary care physicians are therefore at the center of this strategy. It is therefore crucial to gain an understanding of the attitude, knowledge and skills of primary care physicians regarding the treatment of mental health conditions. Such data could more effectively guide the efforts to improve mental health treatment delivery in the community. However, there are very few studies on this topic to date (6). Most of the research about provider knowledge and confidence about mental health treatment is focused on the secondary care of mental health in hospital settings by psychiatrists. In Qatar, there are no existing studies of these attributes in primary care providers; given the Qatar national mental health strategy, it is imperative to conduct research in this field.

Current evidence suggests that knowledge about mental health care can vary widely in the primary care physician population, despite the centrality of their role in mental health treatment (16). Assessments of this population's attitudes and confidence about treating mental health conditions is critical, as these qualities may or may not be in phase with their knowledge base, with significant treatment implications in either case.

Materials and Methods

We collected demographic and practice data about the respondents in five domains: age range, gender, certification type, years of psychiatric training or experience and number of psychiatric educational activities undertaken in the last 12 months (see Appendix 1).

To assess primary care physicians' attitudes about mental health treatment, we used the Mental Illness: Clinicians' Attitude Scale (MICA-4), a well-validated tool developed in the United Kingdom by Thornicroft, Kassam and colleagues in 2010, with express permission from the authors (18). The MICA-4 is a 28-item questionnaire, consisting of statements with which respondents can indicate their level of agreement using Likert scale responses. Of these items, 16 of them measure respondents' attitudes about mental health (see Appendix 2).

Similarly, 12 subsequent items devised by the authors assessed the respondents' confidence about commonly encountered aspects of mental health treatment provision, again using a Likert scale to signify agreement with the metric's suggested terms (see Appendix 3).

A 10-item, multiple choice knowledge assessment was designed by the authors and administered to respondents, aiming to ascertain primary care physicians' understanding of mental health care management. The examination items were intended to portray common encounters of mental health treatment in the primary care setting. The examination included questions about diagnostic criteria for common conditions, psychiatric medication management and evidence-based psychosocial treatment. The questions were designed to assess the diagnosis and treatment of most common mental health conditions, including generalized anxiety disorder and depression (see Appendix 4).

The four parts of the assessment tool were combined into a single survey, which was then sent anonymously (via the web-based survey administration application Google Forms) to primary care physicians in Qatar's Primary Health Care Corporation (PHCC) system via email. Participation in the study was entirely voluntary, creating a "variable sampling" study design.

Results

There were 115 respondents to the survey. Results were analyzed using descriptive statistics.

Demographics
By far, the most represented age demographic in the responding population were those 36-45 (59.1% of respondents) and 46-55 (31.3%). Respondents were predominantly male, by a ratio of about 2 to 1 (67% vs 33%). The vast majority of surveyed physicians obtained practice qualification through one of three means: Membership of the Royal College of General Practitioners in the United Kingdom, or MRCGP UK (47%), the Arab Board (21.7%) or the General Practitioner, or GP, qualification (13.9%). Most respondents (75.7) had less than two years of psychiatric training or experience and had taken two or fewer psychiatric education courses in the last year (83.4%).

Age group of respondent

Age	Frequency (n)	Percentage (%)
25 - 35	3	2.61
36 - 45	68	59.13
46 - 55	36	31.30
56 - 75	8	6.96
Total	115	100.00

Table 1: Age of survey respondents

Gender	Frequency (n)	Percentage (%)
Male	77	66.96
Female	38	33.04
Total	115	100.00

Table 2: Gender of survey respondents

Qualification	Frequency (n)	Percentage (%)
MRCGP UK	54	46.96
Arab Board	25	21.74
GP	16	13.91
MRCGP International	7	6.09
American Board of Pediatrics	1	0.87
Egyptian integrated course of family medicine	1	0.87
MBBS	2	1.74
MICGP, FRCPI, FRCP	1	0.87
MRCPsych	1	0.87
Arab board /Jordanian board	1	0.87
FRACGP	2	1.74
Arab Board + Egyptian fellowship+MRCGP (international)	1	0.87
MMCH	1	0.87
Missing	2	1.74
Total	115	100.00

Table 3: Qualification of survey respondents

Attitude

Survey respondents typically had positive and proactive attitudes toward mental health care; for example, out of 115 respondents, most (65.2%) disagreed that they learn mental health strictly out of obligation, and they largely (77.5%) disagreed with the idea that those with mental illness cannot recover enough to have a good quality of life. and the large majority (83.5%) had at least some level of agreement that they feel just as comfortable talking to someone with a mental illness as they do with someone with a physical illness. An overwhelming majority (87.8%) of respondents felt that working in mental health was just as respectable as working in other health disciplines, and 3 out of every 4 respondents (74.1%) disagreed with the idea that working in mental health was not like working in a "real" health field.

Results were more mixed when respondents answered more personal hypothetical questions about mental illness: nearly half (46.1%) agreed that if they had a mental illness, they would never disclose the mental illness to a friend for fear of being treated differently, and over half (53.9%) agreed that they wouldn't tell a colleague. However, when given the scenario that a colleague had a mental illness, nine of ten respondents (89.5%) expressed continued desire to work with that colleague.

Primary care physicians also felt that people with severe mental illness can be dangerous. A little over half (51.4%) of respondents believed, at some level, that people with severe mental illness are dangerous more often than not. A large majority (74.7%) disagreed with the idea that the public does not need to be protected against those with severe mental illness.

Yet, such concerns did not seem to affect the respondents' sense of comfort with and respect for people with mental illness. The most strongly held sentiment in the entire survey came from the 74 respondents (64.5%) who strongly disagreed with the statement "I would use terms like 'crazy', 'nutter', 'mad', etc. to describe to a colleague someone with a mental illness who I have seen in my work." Nine of ten respondents (89.5%) expressed some level of disagreement with the statement. About five out of every six respondents (83.5%) stated that they feel as comfortable talking to a person with mental illness as they did talking to a person with a physical illness. Nearly four out of five (78.2%) stated that if a senior colleague instructed them to treat people with a mental illness in a disrespectful manner, they would not follow the colleague's instructions. Notably, 56.5% strongly agreed with this sentiment.

The group was also mostly in accordance when offering opinions about the role of health providers in patients with mental illness. There was nearly universal agreement (96.6%) that anyone who supports someone with a mental illness should ensure that their physical health is assessed. The majority of the group (60.3%) believed that health care/social care staff know more about the lives of people with mental illness than do their family or friends. More than four out of five respondents (81.5%) disagreed with the idea that they would ascribe physical symptoms to mental illness. Finally, three out of four respondents (75.6%) strongly disagreed with the opinion that general practitioners should not be expected to complete a thorough assessment for people with psychiatric symptoms since they can be referred to a psychiatrist.

Table 2 - Responses for confidence rating								
Response items	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Missing
I feel confident in my clinical ability to detect common mental health problems like anxiety or depression	1 (0.9%)	0	4 (3.5%)	2 (1.7%)	19 (16.5%)	1 (0.9%)	88 (76%)	0
I feel confident in my clinical ability to detect serious mental health problems like psychosis (including schizophrenia)	3 (2.6%)	1 (0.9%)	5 (4.3%)	23 (20%)	41 (35.7%)	0	42 (36.5%)	0
I feel confident in my clinical ability to detect substance misuse problems	1 (0.9%)	0	7 (6.1%)	32 (27.8%)	53 (46.1%)	0	22 (19.1%)	0
I feel confident in my clinical ability to take a proper psychiatric history	0	0	5 (4.3%)	11 (9.6%)	51 (44.3%)	0	48 (41.7%)	0
I feel confident in my clinical ability to carry out a mental state examination	0	0	7 (6.1%)	14 (12.2%)	36 (31.3%)	0	58 (50.4%)	0
I feel confident in my clinical ability to do risk assessment in a patient with mental health problem	1 (0.9%)	0	4 (3.5%)	11 (9.6%)	56 (48.7%)	0	43 (37.4%)	0
I feel confident in my clinical ability to complete PHQ-9 and HADS-7	1 (0.9%)	0	4 (3.5%)	7 (6.1%)	19 (16.5%)	0	84 (73%)	0
I feel confident in my clinical ability to make diagnosis of a common mental health problem like anxiety or depression	0	0	2 (1.7%)	5 (4.3%)	21 (18.3%)	0	85 (73.9%)	2 (1.7%)
I feel confident in my clinical ability to provide active listening and helpful advice to the patients suffering from common mental health problems like anxiety or depression	0	0	1 (0.9%)	5 (4.3%)	36 (31.3%)	0	73 (63.5%)	0
I feel confident in my clinical ability to initiate / change pharmacological treatment for common mental health problem like anxiety or depression	2 (1.7%)	0	5 (4.3%)	8 (7%)	42 (36.5%)	0	58 (50.4%)	0
I feel confident in my clinical ability to provide psycho-education to patients with common mental health problems like anxiety or depression	1 (0.9%)	0	9 (7.8%)	9 (7.8%)	50 (43.5%)	0	46 (40%)	0
I feel confident in my clinical ability to manage patients with suicide/self-harm tendencies	15 (13%)	0	15 (13%)	24 (20.9%)	41 (35.7%)	0	20 (17.4)	0

Confidence

Respondents expressed high levels of confidence about their abilities to detect common mental health problems like anxiety or depression (94.3%) and with 92.5% of this physician group at least somewhat agreeing that they feel competent at treating these conditions. Nearly three out of four (73.9%) respondents strongly felt that they could readily make diagnoses of depression and anxiety. When asked if they felt confident about medication management for common conditions, 86.5% of physicians agreed (at least in part) that they do.

With regards to identifying serious mental health conditions (e.g., psychosis or schizophrenia), more than two third (72%) felt confident enough to detect these conditions in the community. Similarly, nearly two thirds (65%) of the physicians, felt confident in diagnosing substance use disorders. More than 9 out of 10 physicians (94.8%) felt confident to listen to patients and provide psychological advice to them. A vast majority of the physicians (86.1%) felt confident in carrying out risk assessment on mental health patients, but only about half of the physicians (53.1%) felt confident that they can manage patients with suicide / self-harm risks.

Table 2 - Responses for confidence rating

Response items	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Missing
I feel confident in my clinical ability to detect common mental health problems like anxiety or depression	1 (0.9%)	0	4 (3.5%)	2 (1.7%)	19 (16.5%)	1 (0.9%)	88 (76%)	0
I feel confident in my clinical ability to detect serious mental health problems like psychosis (including schizophrenia)	3 (2.6%)	1 (0.9%)	5 (4.3%)	23 (20%)	41 (35.7%)	0	42 (36.5%)	0
I feel confident in my clinical ability to detect substance misuse problems	1 (0.9%)	0	7 (6.1%)	32 (27.8%)	53 (46.1%)	0	22 (19.1%)	0
I feel confident in my clinical ability to take a proper psychiatric history	0	0	5 (4.3%)	11 (9.6%)	51 (44.3%)	0	48 (41.7%)	0
I feel confident in my clinical ability to carry out a mental state examination	0	0	7 (6.1%)	14 (12.2%)	36 (31.3%)	0	58 (50.4%)	0
I feel confident in my clinical ability to do risk assessment in a patient with mental health problem	1 (0.9%)	0	4 (3.5%)	11 (9.6%)	56 (48.7%)	0	43 (37.4%)	0
I feel confident in my clinical ability to complete PHQ-9 and HADS-7	1 (0.9%)	0	4 (3.5%)	7 (6.1%)	19 (16.5%)	0	84 (73%)	0
I feel confident in my clinical ability to make diagnosis of a common mental health problem like anxiety or depression	0	0	2 (1.7%)	5 (4.3%)	21 (18.3%)	0	85 (73.9%)	2 (1.7%)

I feel confident in my clinical ability to provide active listening and helpful advice to the patients suffering from common mental health problems like anxiety or depression	0	0	1 (0.9%)	5 (4.3%)	36 (31.3%)	0	73 (63.5%)	0
I feel confident in my clinical ability to initiate / change pharmacological treatment for common mental health problem like anxiety or depression	2 (1.7%)	0	5 (4.3%)	8 (7%)	42 (36.5%)	0	58 (50.4%)	0
I feel confident in my clinical ability to provide psycho-education to patients with common mental health problems like anxiety or depression	1 (0.9%)	0	9 (7.8%)	9 (7.8%)	50 (43.5%)	0	46 (40%)	0
I feel confident in my clinical ability to manage patients with suicide/self-harm tendencies	15 (13%)	0	15 (13%)	24 (20.9%)	41 (35.7%)	0	20 (17.4)	0

Knowledge

During the knowledge assessment, this primary care physician group was easily able to identify the most important laboratory value for common mental health conditions like depression and anxiety, with 87.8% of respondents correctly answering, "thyroid function tests." Generally, they also correctly identified the most evidence-based psychosocial treatment as cognitive behavioral therapy (71.3%). The group had mixed success with medication management questions. The vast majority of the physicians chose SSRIs (citalopram, fluoxetine, paroxetine) as first line treatment of depression (81%) or anxiety (90%) which is in line with the National Institute for Health and Care Excellence (NICE) guidelines in the United Kingdom (19, 20). Respondents did not know the first line SSRI treatments for depression (73.9% with an incorrect answer) or anxiety (89.6%), as per PHCC's policy. Also, they could not identify the proper protocol to manage SSRI-induced hypomania (76.5%).

Of note, qualification through MRCGP UK was associated with a choice of SSRI for first-line treatment of depression (OR = 17.99, 95% CI 1.01 to 319.69, p = 0.049), and was highly correlated with an answer of paroxetine (the correct answer per PHCC policy) for the first-line treatment of anxiety (OR = 48.24, 95% CI 2.77 to 838.69, p = 0.0078); all 12 correct responses came from physicians with the MRCGP UK qualification.

Which antidepressant would you consider as your first choice for the treatment of depression (considering there are no contraindications) in PHCC?

Number of respondent answers (fluoxetine is correct)
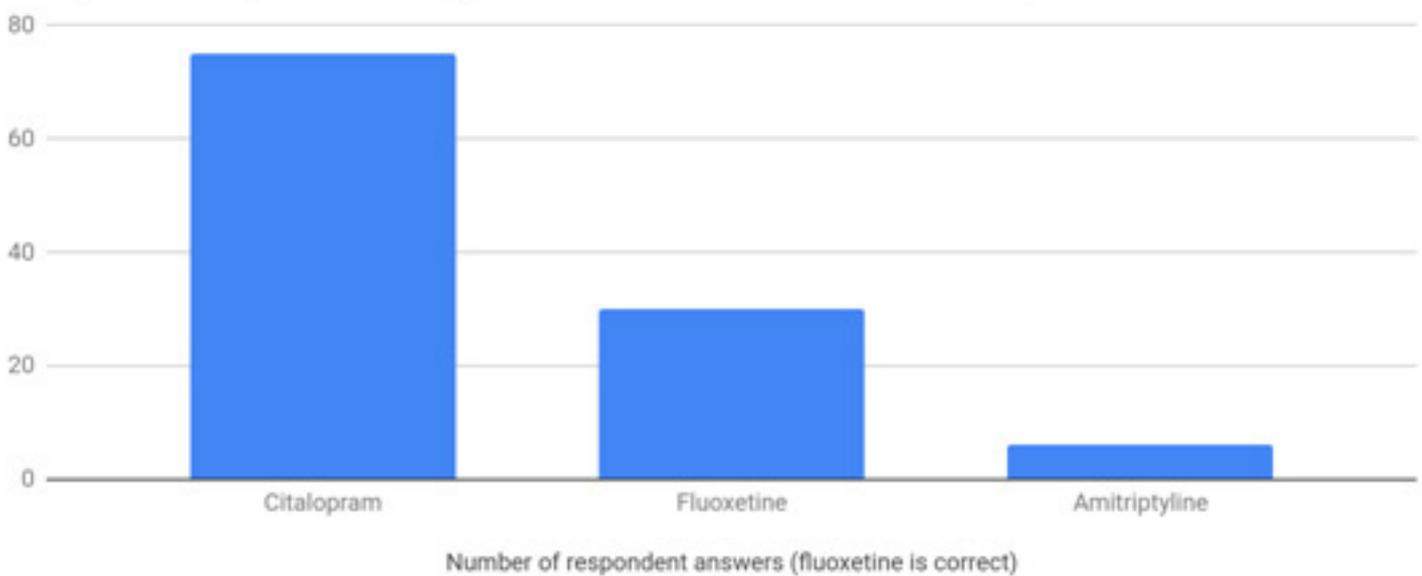
Which medication would you consider as your first choice for the treatment of Generalized Anxiety Disorder in PHCC?

Number of repondent answers (Paroxetine is correct)
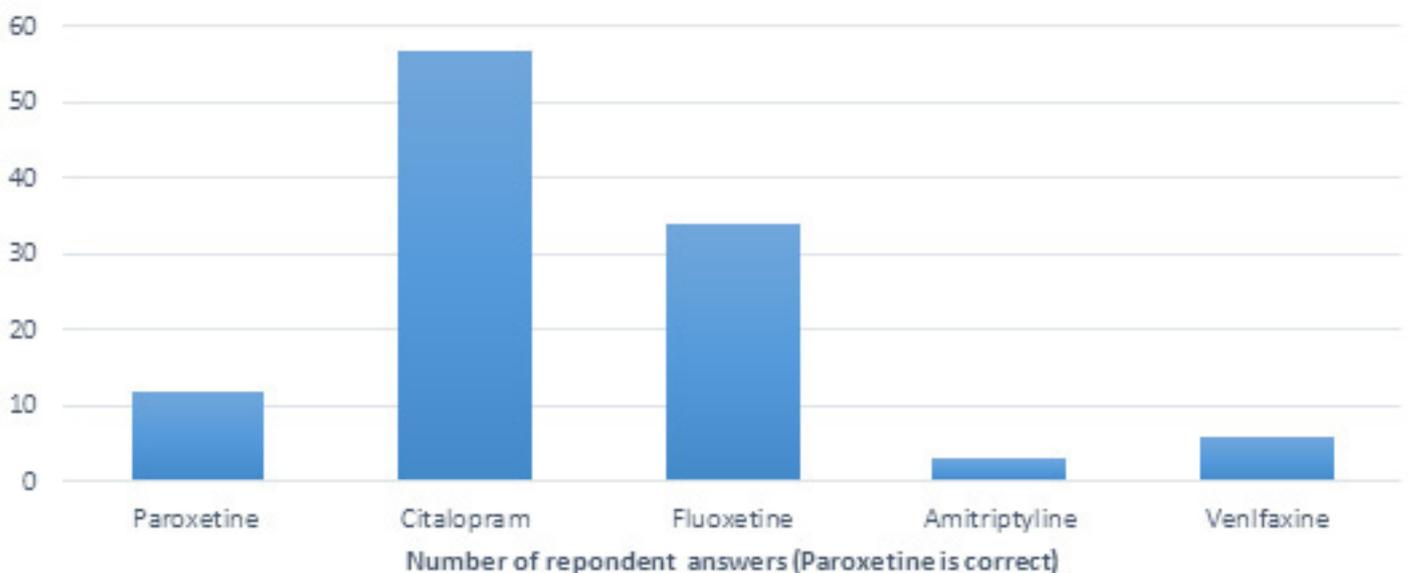
Table 3 - Responses on items regarding knowledge

Possible answers	72 hours	1 week	2 weeks	1 month	2 months	6 months	There is no time limit
D1	12 (10.4%)	1 (0.9%)	65 (56.5%)	9 (7.8%)	10 (8.7%	4 (3.5%)	12 (10.4%)
Possible answers	72 hours	2 weeks	1 month	2 months	6 months	There is no time limit	Missing
D2	7 (6.1%)	47 (40.9%)	21 (18.3%)	12 (10.4%)	15 (13%)	13 (11.3%)	0
Possible answers	CBC	CMP	Glucose	Testosterone	TFT	Missing	
D3	2 (1.7%)	5 (4.3%)	6 (5.2%)	1 (0.9%)	101 (87.8%)	0	
Possible answers	Amitriptyline	Citalopram	Fluoxetine	Missing			
D4	6 (5.2%)	75 (65.2%)	30 (26.1%)	4 (3.5%)			
Possible answers	Amitriptyline	Citalopram	Fluoxetine	Paroxetine	Venlafaxine	Missing	
D5	3 (2.6%)	57 (49.6%)	34 (29.6%)	12 (10.4%)	6 (5.2%)	3 (2.6%)	
Possible answers	Straightaway	Within 72 hours	Within 1 week	Within 2 to 4 weeks	Within 4 to 6 weeks	Missing	
D6	3 (2.6%)	8 (7%)	14 (12.2%)	69 (60%)	21 (18.3%)	0	
Possible answers	Stop	Half the dose and stop in 2 months	Slowly reduce over 4 weeks and stop	Continue with same dose and consider stopping in 4 months	Continue with same dose and consider stopping in 12 months	Missing	
D7	5 (4.3%)	7 (6.1%)	26 (22.6%)	42 (36.5%)	32 (27.8%)	3 (2.6%)	
Possible answers	CBT	EMDR	Counselling	All above are equally effective	Missing		
D8	82 (71.3%)	2 (1.7%)	5 (4.3%)	26 (22.6)	0		
Possible answers	Change medication and refer to psychiatry	Increase the dose and refer to psychiatry	Reduce the dose and refer to psychiatry	Stop the medication and refer to psychiatry	Refer to psychiatrist	Review him in 2 weeks	Missing
D9	4 (3.5%)	3 (2.6%)	15 (13%)	27 (23.5%)	36 (31.3%)	27 (23.5%)	3 (2.6%)
Possible answers	GAD	Hypochondriasis	IBS	Somatization	Undiagnosed depression	Missing	
D10	15 (13%)	50 (43.5%)	4 (3.5%)	40 (34.8%)	5 (4.3%)	1 (0.9%)	

Discussion

A significant limitation of the study is that while measures of clinician attitudes about mental health care treatment were obtained with a well-validated tool, assessments of primary clinicians' confidence and knowledge were made using tools designed by the authors. Validation of the confidence and knowledge assessments has come from local consensus. Another limitation is its reliance on subjective responses rather than on patient records or directly observed procedures. Potential consequences of this approach include potential participant bias toward answers perceived to be desirable. The respondents' candor, especially in their responses about the dangers engendered by mental illness, makes the existence of such bias somewhat less likely. Strengths include the usage of a well-validated instrument and a relatively large sampling.

In 2008, the number of primary care physicians in Qatar was estimated to be 419 (21); this study had 115 respondents, 27.4% of the 2008 estimated population.

Previous research has suggested that there are gaps in primary care physicians' knowledge about mental health care (14, 15, 22). This study shows that, particularly regarding psychiatric medication management and diagnostic criteria for conditions like depression and anxiety, primary care physicians appear to have a lack of knowledge of the local (PHCC) policies regarding managing common mental health conditions at primary care level. However, a vast majority of the physicians did show that they have knowledge of some of the fundamental mental health principles to recognize and manage common mental health problems. Although primary care physicians lack knowledge of the local PHCC's policies in the management of common mental health conditions like anxiety and depression, they have

fundamental knowledge required to treat these conditions as per NICE guidelines.

One of the reassuring findings of this survey is that a vast majority of the primary care physicians feel confident in recognizing and managing common mental health problems in the community. More than two thirds of the physicians felt confident that they can detect serious mental health conditions like psychosis and schizophrenia. This is very encouraging. Of course, they are not expected to manage these patients in the community, but early recognition and diagnosis mean that these patients will be referred to psychiatry teams on time and they will be given appropriate treatment and support. This can help improve the long term prognosis and outcome for these patients.

Among the most surprising findings for this respondent group was the wide disparity between their knowledge gap and their generally positive attitudes and high levels of confidence about mental health treatment. Primary care physicians expressed a high level of confidence about medication management for common conditions — 86.5% of the respondents agreed, at least in part, that they feel comfortable with managing psychiatric medications, but only 26.1% of the respondent group knew the first-line medication for depression, and only 10.4% of the group knew the first-line medication for anxiety. At first glance, these findings appear grim; a detailed look reveals that they chose one of the SSRIs (citalopram, fluoxetine, paroxetine) as a first line medication in the treatment of depression (81%) and anxiety (90%) which is in line with NICE guidelines in the UK. The reason for this may be the fact that nearly half of the physicians (47%) had an MRCGP qualification and were used to practicing under the UK's NICE guidelines, but were not aware of the local PHCC policies on the management of depression and anxiety.

The knowledge section of the survey did highlight that physicians need to be more aware of the criteria for duration of symptoms for diagnosing anxiety or depression. They also need to be aware of how long they should continue with the treatment and when to consider stopping medications. Only 27.8% of these respondents could identify the proper length of time to remain on an antidepressant after resolution of depressive symptoms. Just 23.5% — less than one quarter — of the group could properly identify the procedure when an SSRI creates hypomanic symptoms.

Despite these gaps in the knowledge of mental health management, primary care physicians appear to be highly willing and feel confident to treat common mental health conditions. Such attitudes suggest that the clinicians' positivity can be leveraged with dedicated training on mental health care delivery especially familiarity with local guidelines and policies. We believe that most of the primary care physicians are well placed in managing common mental health problems in the community. However, in order to have a well-integrated community care as per the vision of Qatar National Mental Health Strategy, primary care physicians should be trained with specific focus on the local policies and pathways.

Summary

Primary care physicians represent the first line of treatment of mental health conditions, and they perform the bulk of such treatment. In Qatar, where primary care physicians are the centerpiece of the national strategy to improve mental health care delivery, primary care doctors consistently demonstrate strongly positive attitudes and confidence about mental health care treatment. These physicians appear to have good fundamental knowledge but lack knowledge of the local policies about mental health treatment. Further study can help psychiatrists, primary care providers and government officials efficiently target resources to optimize mental health treatment provision.

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Appendix1. Demographics

1. Age
- 25 - 35
- 36 - 45
- 46 - 55
- 56 - 75

2. Gender
- Male
- Female

3. Qualification
- MRCGP UK
- MRCGP International
- Arab Board
- MRCPsych
- Other:
-

4. Years of previous psychiatric training / experience:
- 0 years
- 1 - 2 years
- 3 - 5 years
- 5 - 10 years
- More than 10 years

5. How many educational sessions have you attended regarding mental health care in the last 12 months?
0
1
2
3
4
5

Appendix 2. Attitude questions as per MICA-4.

1. Strongly Agree
2. Agree
3. Somewhat Agree
4. Somewhat Disagree
5. Disagree
6. Strongly Disagree

1. I just learn about mental health when I have to, and would not bother reading additional material on it.

2. People with a severe mental illness can never recover enough to have a good quality of life.

3. Working in the mental health field is just as respectable as other fields of health and social care.

4. If I had a mental illness, I would never admit this to my friends because I would fear being treated differently.

5. People with a severe mental illness are dangerous more often than not.

6. Health/social care staff know more about the lives of people treated for a mental illness than do family members or friends.

7. If I had a mental illness, I would never admit this to my colleagues for fear of being treated differently.

8. Being a health/social care professional in the area of mental health is not like being a real health/social care professional.

9. If a senior colleague instructed me to treat people with a mental illness in a disrespectful manner, I would not follow their instructions.

10. I feel as comfortable talking to a person with a mental illness as I do talking to a person with a physical illness.

11. It is important that any health/social care professional supporting a person with a mental illness also ensures that their physical health is assessed.

12. The public does not need to be protected from people with a severe mental illness.

13. If a person with a mental illness complained of physical symptoms (such as chest pain) I would attribute it to their mental illness.

14. General practitioners should not be expected to complete a thorough assessment for people with psychiatric symptoms because they can be referred to a psychiatrist.

15. I would use the terms 'crazy','nutter', 'mad' etc. to describe to colleagues people with a mental illness who I have seen in my work.

16. If a colleague told me they had a mental illness, I would still want to work with them.

Appendix 3. Questionnaire items examining confidence about mental health treatment.

1. I feel confident in my clinical ability to detect common mental health problems like anxiety or depression
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

2. I feel confident in my clinical ability to detect serious mental health problems like psychosis (including schizophrenia)
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

3. I feel confident in my clinical ability to detect substance misuse problems
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

4. I feel confident in my clinical ability to take a proper psychiatric history
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

5. I feel confident in my clinical ability to carry out a mental state examination
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

6. I feel confident in my clinical ability to do risk assessment in a patient with mental health problem.
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

7. I feel confident in my clinical ability to complete PHQ-9 and HADS-7
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

8. I feel confident in my clinical ability to make diagnosis of a common mental health problem like anxiety or depression
1. Strongly agree
2. Somewhat agree
3. Neutral
4. Somewhat disagree
5. Strongly disagree

9. I feel confident in my clinical ability to provide active listening and helpful advice to the patients suffering from common mental health problems like anxiety or depression
1.   Strongly agree
2.   Somewhat agree
3.   Neutral
4.   Somewhat disagree
5.   Strongly disagree

10. I feel confident in my clinical ability to initiate / change pharmacological treatment for common mental health problem like anxiety or depression
1.   Strongly agree
2.   Somewhat agree
3.   Neutral
4.   Somewhat disagree
5.   Strongly disagree

11. I feel confident in my clinical ability to provide psycho-education to patients with common mental health problem like anxiety or depression
1.   Strongly agree
2.   Somewhat agree
3.   Neutral
4.   Somewhat disagree
5.   Strongly disagree

12. I feel confident in my clinical ability to manage patients with suicide/self-harm
1.   Strongly agree
2.   Somewhat agree
3.   Neutral
4.   Somewhat disagree
5.   Strongly disagree

1.   Refer the patient to psychiatry
2.   Change the antidepressant and refer the patient to psychiatry
3.   Increase the dose of antidepressant and refer the patient to psychiatry
4.   Reduce the dose of antidepressant and refer the patient to psychiatry
5.   Stop the antidepressant and refer the patient to psychiatry
6.   It's too early to change anything at this stage. Review him again in 2 weeks.

Appendix 4. knowledge based questions.

1. In order to diagnose a patient with clinical depression, he or she must have depressive symptoms for a minimum duration of
1.	72 hours
2.	2 weeks
3.	1 month
4.	2 months
5.	6 months
6.	There is no time limit

2. In order to diagnose a patient with clinical Generalized Anxiety Disorder (GAD), he or she must have anxiety symptoms for a minimum duration of
1.	72 hours
2.	2 weeks
3.	1 month
4.	2 months
5.	6 months
6.	There is no time limit

3. The single most important blood test to do in a patient with common mental health problem (anxiety or depression) is
1.	Complete Blood Count - CBC
2.	Comprehensive Metabolic Profile - CMP
3.	ESR
4.	Thyroid Function Test - TFT
5.	Glucose
6.	Testosterone

4. Which antidepressant would you consider as your first choice for the treatment of depression (considering there are no contraindications) in PHCC?
1.	Citalopram
2.	Paroxetine
3.	Fluoxetine
4.	Amitriptyline
5.	Venlafaxine

5. Which medication would you consider as you first choice for the treatment of Generalized Anxiety Disorder (considering there are no contraindications) in PHCC?
1.	Citalopram
2.	Paroxetine
3.	Fluoxetine
4.	Amitriptyline
5.	Venlafaxine

6. SSRIs / antidepressants work
1.	Straightaway
2.	Within 72 hours
3.	Within 1 week
4.	Within 2 – 4 weeks
5.	Within 4 – 6 weeks

(continued)

7. You have successfully treated a patient with first episode of depression, who is now symptoms free and back to his/her baseline. What would you do next?

1.   Stop the antidepressant
2.   Slowly reduce the antidepressant over a 4 week period to stop it.
3.   Half the dose and stop it after 2 months' time.
4.   Continue with same dose and consider stopping it in 4 months' time.
5.   Continue with the same dose and consider stopping it in 12 months' time.
6.   Advise them to stay on it for life.

8. The following psychological therapy has the most evidence-based role in the management of common mental health problems like anxiety or depression
1.   Counselling
2.   Debriefing
3.   Cognitive Behavioral Therapy
4.   Hypnotherapy
5.   EMDR
6.   All the above are equally effective

9. You have started a patient on antidepressant. During a follow-up appointment after 2 weeks, you notice that the patient exhibit signs and symptoms of hypomania. What would you do next?
1.   Refer the patient to psychiatry
2.   Change the antidepressant and refer the patient to psychiatry
3.   Increase the dose of antidepressant and refer the patient to psychiatry
4.   Reduce the dose of antidepressant and refer the patient to psychiatry
5.   Stop the antidepressant and refer the patient to psychiatry
6.   It's too early to change anything at this stage. Review him again in 2 weeks.

10. A 36 year old female patient has a history of repeated presentations for abdominal pain because she is worried about cancer. She has been intensively investigated including CT abdomen and Endoscopies by the gastroenterologist who did not find any evidence of bowel cancer or other physical cause. Despite all the normal investigations she is still worried about bowel cancer. What is the likely diagnosis?
1.   Diverticulosis
2.   IBS
3.   Generalized anxiety disorder
4.   Undiagnosed depression presenting with physical health symptoms
5.   Somatization
6.   Hypochondriasis

Incorporating Resilience into the Family Medicine Training Curriculum

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Abstract

Family Medicine training curricula are extensive documents that contain what needs to be taught and learned during a training programme. Emotional Stress and burn out is common in General Practitioners In the United Kingdom due to work load pressures in the National Health Service.

Resilience is the ability or capacity to regulate stress and resilience can be considered as an emotional competence and a behavior that can be developed or enhanced during training.

We recommend the consideration of incorporating resilience training and development into the curriculum design of family medicine training programmes to better prepare Family Physicians to cope with the emotional stress and burn out associated with working as a Family Physician.

Key words: Resilience, Curriculum Design, Medical Education, Family Medicine Training

Background

A country's family medicine training curriculum is of upmost importance in that it informs the learner what needs to be learned, the teacher what needs to be taught and also then determines that which is to be assessed [1]. The General Medical Council (GMC) in the United Kingdom (UK) regulates the development of undergraduate and postgraduate curricula as per the Medical Act 1983 in the UK. The GMC offers a definition of the term curriculum in its document entitled standards for curricula and assessment systems [2]:

''A statement of the intended aims and objectives, content, experiences, outcomes and processes of a programme, including a description of the structure and expected methods of learning, teaching, feedback and supervision. The curriculum should set out what knowledge, skills and behaviours the trainee will achieve"

Thus the GMC through its policy directive is quite prescriptive in terms of what it expects of medical schools and Royal Colleges that are developing and designing both undergraduate and post graduate curriculum.

The Royal College of General Practitioners (RCGP) has produced an extensive 343 page curriculum for its General Practitioner trainees in the UK [3]. It has a more consolidated 60 page document that outlines the way the curriculum is structured into three broad areas. The first is the core curriculum statement of 'being a general practitioner' in which ''broad areas of capability'' are outlined in the document [4]. The second is the professional modules which include patient safety, quality of care and the GP in the wider professional environment. The third is the clinical modules which cover a range of specialities.

Developing Resilience in GP trainees

The hidden curriculum [5] is a process by which trainees learn things implicitly which are not part of the formal curriculum. In General Practice the hidden curriculum is important for the new GP trainee as lots of 'rules' are implicit. Burnout is very common in medical professionals and GPs in particular. A study conducted using the Maslach Burnout Inventory (MBI) surveyed 564 GPs. The results showed 46% had high levels of "emotional exhaustion and depersonalisation" and 34% reported low levels of personal accomplishment [6].

This high level of burnout is evident in the general practice workforce and morale is low and there is an unprecedented recruitment and retention crisis. A recent report in the Independent newspaper in April 2017 lamented how the NHS was "haemorrhaging GPs at an alarming rate" as GP numbers went down rather than up [7].

We feel one area of Family Medicine Training curricula can be enhanced by incorporating 'resilience' training into the formal curriculum. The GMC mention behaviours as well as knowledge in their definition of curriculum, so resilience could be a behaviour trait that is encouraged through curriculum design, planning and consideration for nations that have formal family medicine residency programmes.

Identifying burnout

Resilience training could be general or be targeted to those most in need by identifying burnout. The most commonly used burnout inventory is the Maslach Burnout Inventory (MBI) and then the Burnout Measure (BM). The burnout measure defines burnout as being "a state of physical, emotional and mental exhaustion caused by long term involvement in situations that are emotionally demanding" [8].

Family Medicine trainees and Family Medicine Physicians are often in situations that are physically and mentally exhausting and hence are at a high risk of burnout and hence awareness of burnout and increasing resilience of trainees should be an important part of the curriculum.

A systematic review examined numerous studies searched for on a definition of resilience and came across a multitude of interpretations. One of the studies mentioned the definition of resilience as being "able to moderate the negative effects of stress" whilst another suggested it was "a dynamic evolving process of positive attitudes and effective strategies" [9]. Dr King who is a psychiatrist wrote in a recent blog on the General Medical Council UK website [10] that resilience is "not only the ability to cope with stress but being able to thrive and flourish in difficult circumstances. It is not about asking doctors to grin and bear it and handle intolerable organisational pressures or excessive workloads. Neither is it about naming and shaming of the 'weak' doctor" [10].

A recent article by a GP educationalist implored medical educators to consider resilience as an 'emotional competence' and a "behaviour that can be acquired through training"[11]. It is more difficult to plan for emotional or behavioural competencies and perhaps this is why educators may be less keen to consider them in curriculum design.

Curriculum Planning Cycle

Peyton and Peyton suggest a curriculum planning cycle outlined in Figure 1 [12]. We applied the cycle to reflect on the possibility of enhancing an existing curriculum. The needs assessment has been done in that there is ample evidence of burnout amongst GPs, so doing something to prevent this will help in theory. The output would be trainees that are more emotionally resilient and less likely to burn out. The Design and Implementation is what I would like to focus on in this essay.

Figure 1: Peyton and Peyton 1998

Needs Assessment

Output

Design

Implementation
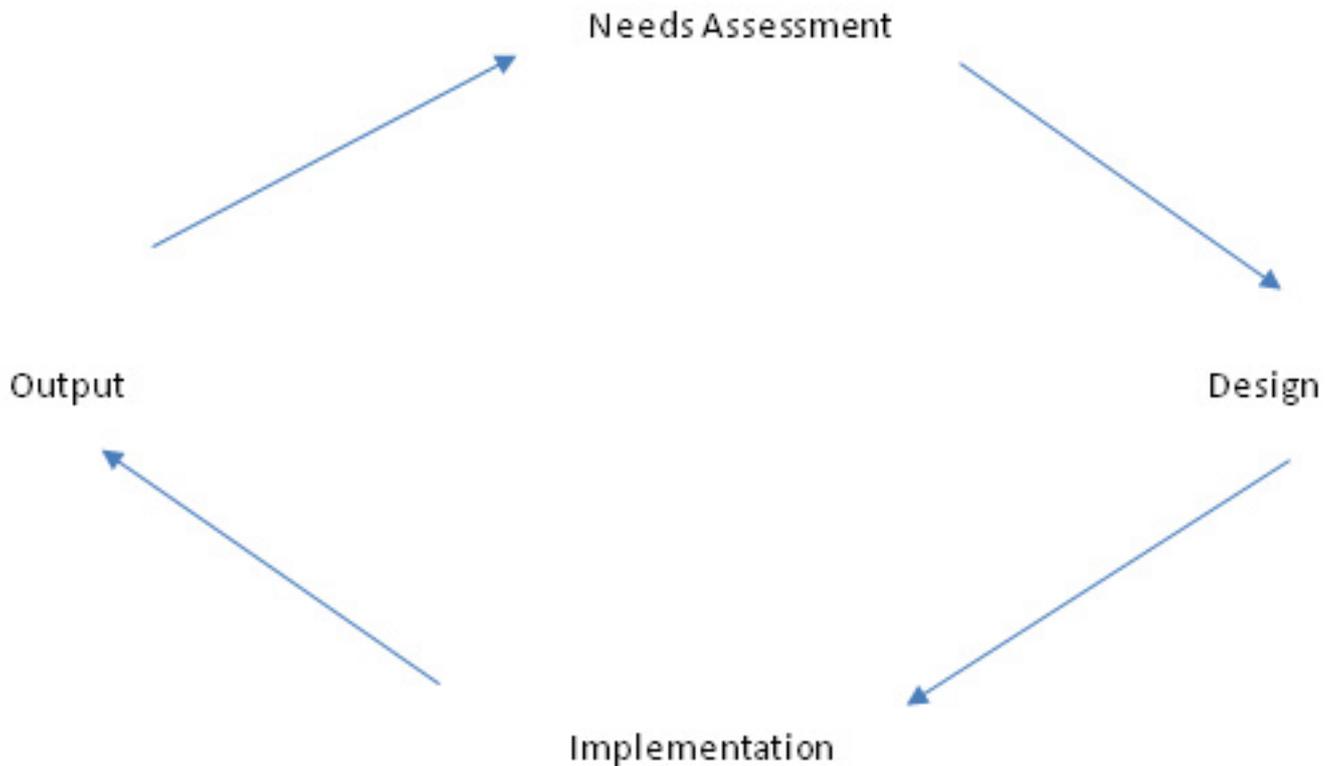
The SPICES Model

The SPICES Model [13] outlines some educational strategies to consider when developing curriculum with each of these six issues presented as a spectrum with two opposing positions as outlined in Figure 2.

Figure 2: The SPICES Model

1. Student Centred..Teacher Centred
2. Problem based..Information Gathering
3. Integrated..Discipline Based
4. Community based..Hospital Based
5. Elective..Standard Programme
6. Systematic..Apprenticeship or opportunistic

Considering these curriculum strategies in relation to incorporating resilience development into an existing curriculum was helpful. It is thought those curricula that are to the left side of Figure 2 are innovative whilst the right side is more traditional. The curriculum enhancement we are suggesting would have to be student centred although in post graduate terms it would be trainee centred rather than teacher or trainer centred. There seems to be little scope for a teacher telling someone how to be resilient but one could be 'coached' or guided to being more resilient.

An example of this could be helping a trainee learn how to say 'no' or learning how to delegate to manage workload better and hence increase emotional resilience. You could leave a trainee to be on call with various requests from all the community allied health professionals and requests from secondary care colleagues for months and they may be drowning in the workload, using the 'problem based learning' approach to come up with solutions. Or the trainer could guide the trainee to advise them to use community resources such the emergency care practitioner who could potentially do some of their home visits and reduce the workload.

This strand of the curriculum would have to be integrated as it transcends disciplines and could be both community based and hospital based. Resilience can be developed for the Family Medicine trainee who is doing 12 days in a row during his Emergency department rotation or the paediatric trainee who is doing the night shifts looking after unwell neonates. It would have to be part of the standard programme as it is not a skill or piece of knowledge, but attitude or behaviour that is being developed and cannot be confined to an elective block.

One day Workshops and Integration

During a recent GP training event in South Yorkshire there was thought given to resilience training as 'resilience' is the new buzz word in medical training given the current NHS crisis and low junior doctor morale amidst contract disputes and ever increasing workload. A one-day conference was organised at a local football stadium and workshops were organised around resilience. The most notable workshop was by a company called 'Chimp management' [14]. This workshop was on mind management and controlling the 'inner chimp' as a way of increasing emotional wellbeing and resilience. It offered strategies of how to put certain emotions into a 'box' when dealing with work related stress. It was useful to reflect on ones 'inner chimp' and how to deal with negative primate emotions in the face of adversity.

However, resilience training should be built into the curriculum in an integrated fashion rather than a one off study day.

Integration in medical education terms refers to whether curriculums are compartmentalised into different disciplines or integrated so teaching is interdisciplinary [15]. Horizontal integration refers to multiple disciplines being taught together perhaps around cases or problems, whereas vertical integration refers to integrating what was traditionally thought of as the distinction between pre clinical and clinical years. The spiral model of curriculum design has "clinical placements interspersed with content based learning, emphasising reinforcement, structured repetition and application of learning to clinical medicine" [16].

Most GPs or clinicians will be delivering a part of a curriculum and those who are Training programme directors (TPDs) will be planning the delivery of the curriculum during the 3 year training programme. I would recommend vertical integration of resilience training so that it is introduced gradually from Year one specialist trainees to final year Family Medicine trainees. Naturally, things will get more difficult as work load pressures increase for final year trainees and professional exams approach so resilience sessions will become increasingly important and relevant.

Outcome Based Curriculum

A recent trend in medical education is to move towards an outcome focussed curriculum [17, 18] where outcomes are defined which then informs curriculum design. In this case, an outcome that could be added would be that GP trainees must demonstrate personal and professional resilience. However, the assessment of this would have to be done via work placed based assessment and commented on by clinical supervisors. This assessment must be formative and can take the shape of discussions in one on one tutorials on development of professional and personal resilience. One of the reasons formative assessment would be important would be so that trainees are not discouraged from seeking help if they were struggling and fearing that would be deemed as not having resilience.

Implementation

In terms of actually incorporating this topic into the 3 year family medicine programme we would propose input from the local training progamme director to ensure some of the weekly half day VTS teaching sessions are devoted to personal and professional resilience. The tutorial sessions can focus on more hands on advice to trainees about how trainees are managing with certain tasks. They can focus on issues specific to the trainee and perhaps create learning opportunities tailor made to the trainees needs. For example, if one trainee is struggling with dealing with patients with multiple issues in ten minute consultations and hence is struggling with their resilience then sessions can be directed at this issue, whereas if another trainee is struggling with burnout due to the heavy workload whilst on call then this can be the focus of a particular tutorial.

Conclusion

Current Family Medicine trainee programmes can be enhanced by including resilience as an emotional competence and having a stated curriculum outcome focussed on personal and professional resilience.

Learner centred, integrated and problem based curriculum design features can be used to plan to include resilience training throughout the 3 year Family Medicine training programme to promote trainee well-being. Assessment of this competence should be formative rather than summative and struggling trainees can be given additional support tailored to their particular needs.

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Determinants of autism among children in Makkah Al-Mukarramah City, Saudi Arabia: A case-control study

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Abstract

Aim of Study: To identify risk factors associated with autism among autistic children in Makkah Al-Mukarramah City.

Subjects and Methods: Following a case-control study design, 100 autistic children 3-12 years old were selected from four rehabilitation centres in addition to 100 age-matched non-autistic children (control group) who were recruited from nearby kindergarten centers and primary schools. Based on relevant review of literature, an Arabic language questionnaire was designed by the researcher.

Results: There were significantly more male autistic children than non-autistic children (71% and 52%, respectively, p=0.006), with a female:male ratio of about 1:3. However, autistic and non-autistic children did not differ significantly according to their age groups, nationality or birth order. Most autistic children (74%) were diagnosed at the age of 4-8 years. The mean age at diagnosis was 6.1±2.4 years. The mean age of mothers of autistic children at their birth was significantly older than that of mothers of non-autistic children (35.1±5.9 years and 35.1±5.9 years, respectively, p=0.015), while mean age of fathers of autistic children at their birth was significantly older than that of fathers of non-autistic children (42.6±7.7 years and 39.7±8.8 years, respectively, p=0.016). Mothers of autistic children have been significantly more exposed to smoke than those of non-autistic children (15% and 6%, respectively, p=0.038). Autistic and non-autistic children did not differ significantly according to their family, prenatal and postnatal characteristics.

Conclusions: Most autistic children become diagnosed at 4-8 years old. The female:male ratio among autistic children is about 1:3. Advanced parental age is a significant risk factor for autism among their children. Exposure of mothers to smoke is a risk factor for autism among their children.

Recommendations: Screening of children, especially boys, for autism during their visits to the well-baby clinics and at school entry. Avoidance of exposure of pregnant mothers and children to smoke. Provision of health education to parents about autism and the importance of avoiding pregnancy at advanced parent ages.

Key words: Autism, Case Control, Risk factors, Saudi Arabia.

Introduction

Autism is a chronic neurodevelopmental disorder associated with an inability to communicate socially or to respond normally to some stimuli in the environment. A systematic review was done to estimate the global effect of autism in 188 countries and showed that autism affects about 21.7 million people as of 2013 (1).

According to the Center for Disease Control and Prevention, about 1 in 68 children has been estimated to have autism in U.S. It is five times more prevalent in boys than girls (2).

The etiology of autism is unknown, but several different factors that make a child more likely to have autism include biological and environmental factors. The genetic factors play a significant role in the disease. However, the presence of environmental risk factors can interact with these genetic factors and increase the possibility of occurrence of the disease (3-4).

Evidence suggests that the critical period for developing autism occurs before, during, and immediately after birth. A meta-analysis was done at the Department of Epidemiology, Harvard School of Public Health, and examined over 60 perinatal and neonatal factors and found an association with some of these factors (5).

Another systematic review summarized the pre, peri and neonatal risk factors that contribute to autism, and concluded that these factors may have a small risk for autism. However, the distinction was not possible if these risks should be considered purely environmental or relevant to genetic vulnerability (6).

A case–control study in Jamaica concluded that maternal and paternal age are associated with autism. Prematurity, low birth weight and small for gestational age are other risk factors for autism determined in research (7). These factors were found to be associated with autism in a case-control study conducted in Finland (8). Furthermore, a case-control study carried out in China, identified nine maternal risk factors that revealed a significant association with autism (9).

In addition, several maternal lifestyle factors such as nutrition and substance use can be related to many neurodevelopment diseases and therefore, may not be unique risk factors for autism (10).

A systematic review on epidemiology of autism concluded that there are limitations in research and no studies on identifying the burden and risk factors of autism in Gulf countries (11).

In Oman, a case-control study about the relation between breastfeeding and autism concluded that the risk of autism increases with delayed breastfeeding and no colostrum introduction, while exclusive breastfeeding and its continuation for two years significantly decreased the risk (12).

Most studies in Saudi Arabia on autism focused on biomarker studies as risk factors. A cross-sectional study done on 49 autistic children found that the communication problem is the most characteristic of an autistic patient with the presence of consanguineous marriages in approximately 29% (13).

Several diagnostic tests make an early diagnosis of autism by the age of 2 years very reliable. However, many cases do not reach final diagnosis until an age of 3 years. Currently, there is no cure for autism but research shows that early intervention treatment services up to 3 years can improve and increase the quality of life and functional independence (2).

The early diagnosis and early intensive treatment have the potential to affect the outcome (14). The diagnosis of autism can be made clinically, based on the history, examination, and observation of behavior. The establishment of appropriate management strategies in the early years can help to minimize or even avoid subsequent behavioral problems (15).

However, despite the increasing prevalence of autism worldwide, there is lack of research about its nature, determinants, diagnosis, and management. Therefore, this study aimed to identify risk factors associated with autism among autistic children in Makkah Al-Mukarramah City.

Subjects and Methods

Following a case-control research design, this study was conducted during 2018 in Makkah Al-Mukarramah City. By simple random sampling, four rehabilitation centers were selected. All autistic children aged 3-12 years old registered in the selected study rehabilitative centers were included. Children with associated other diseases (e.g., ADHD or epilepsy) were excluded.

The minimum sample size for this study was decided according to Dahiru et al. (16), to be 196. Therefore, to fulfill the required sample size, the researchers included 200 children, 100 autistic children and 100 age-matched non-autistic children (control group) who were recruited from nearby kindergarten centers and primary schools.

Based on relevant review of literature, an Arabic language questionnaire was designed by the researcher. The questionnaire was validated by academic professors of epidemiology and family medicine. The questionnaire included demographic data of parents and subjects, as well as pre, peri and neonatal risk factors that may be associated with autism.

A pilot study was conducted on 20 children (10 autistic children and 10 healthy controls) to test the clarity of the study questionnaire. Moreover, the questionnaire's internal consistency was tested by applying Cronbach's alpha coefficient. The data of participants in the pilot study were not included in the main study.

Collected data were coded before computerized data entry. The Statistical Package for Social Sciences (SPSS version 23) was used for data entry and statistical analysis. Descriptive statistics (e.g. number, percentage, mean, and standard deviation) were calculated and tests of significance, (i.e., X^2 and unpaired t-test) were applied. P-values < 0.05 were considered as statistically significant.

Results

Table 1 shows that there were significantly more male autistic children than non autistic children (71% and 52%, respectively, p=0.006), with a female:male ratio of about 1:3. However, autistic and non-autistic children did not differ significantly according to their age groups, nationality or birth order.

Figure 1 shows that 74% of autistic children were diagnosed at the age of 4-8 years, while 12% were diagnosed before their fourth year of age and 14% were diagnosed after their 8th year of age. The mean age at diagnosis was 6.1±2.4 years.

Table 2 shows that autistic and non-autistic children did not differ significantly according to their family characteristics, i.e., number of siblings, parents' educational status, parents' consanguinity, family monthly income or family history of autism.

Table 3 shows that mean age of mothers of autistic children at their birth was significantly older than that of mothers of non-autistic children (35.1±5.9 years and 35.1±5.9 years, respectively, p=0.015). Similarly, mean age of fathers of autistic children at their birth was significantly older than that of fathers of non-autistic children (42.6±7.7 years and 39.7±8.8 years, respectively, p=0.016). Mothers of autistic children have been significantly more exposed to smoke than those of non-autistic children (15% and 6%, respectively, p=0.038). However, other prenatal characteristics of autistic children did not differ significantly from those of non-autistic children, regarding maternal diseases during their pregnancy, intake of non-prescribed drugs during pregnancy, fetal problems or duration of pregnancy.

Table 4 shows that natal characteristics among autistic children did not differ significantly with those of non-autistic children.

Table 5 shows that characteristics of autistic children after labor did not differ significantly from those of non-autistic children, regarding their admission to pediatric intensive care unit, incidence of neonatal jaundice or type of feeding during the first 6 months.

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Table 1: Personal characteristics of participant autistic compared with non-autistic children

| Characteristics	Non-autistic		Autistic		P Value
	No.	%	No.	%	
Age groups					
• ≤5 years	11	11.0	9	9.0	
• 6-10 years	78	78.0	77	77.0	
• >10 years	11	11.0	14	14.0	0.753
Gender					
• Male	52	52.0	71	71.0	
• Female	48	48.0	29	29.0	0.006
Nationality					
• Saudi	81	81.0	88	88.0	
• Non-Saudi	19	19.0	12	12.0	0.171
Birth order					
• 1st	27	27.0	23	23.0	
• 2nd-3rd	29	29.0	39	39.0	
• 4th +	44	44.0	38	38.0	0.328

Figure 1: Age at diagnosis of autism
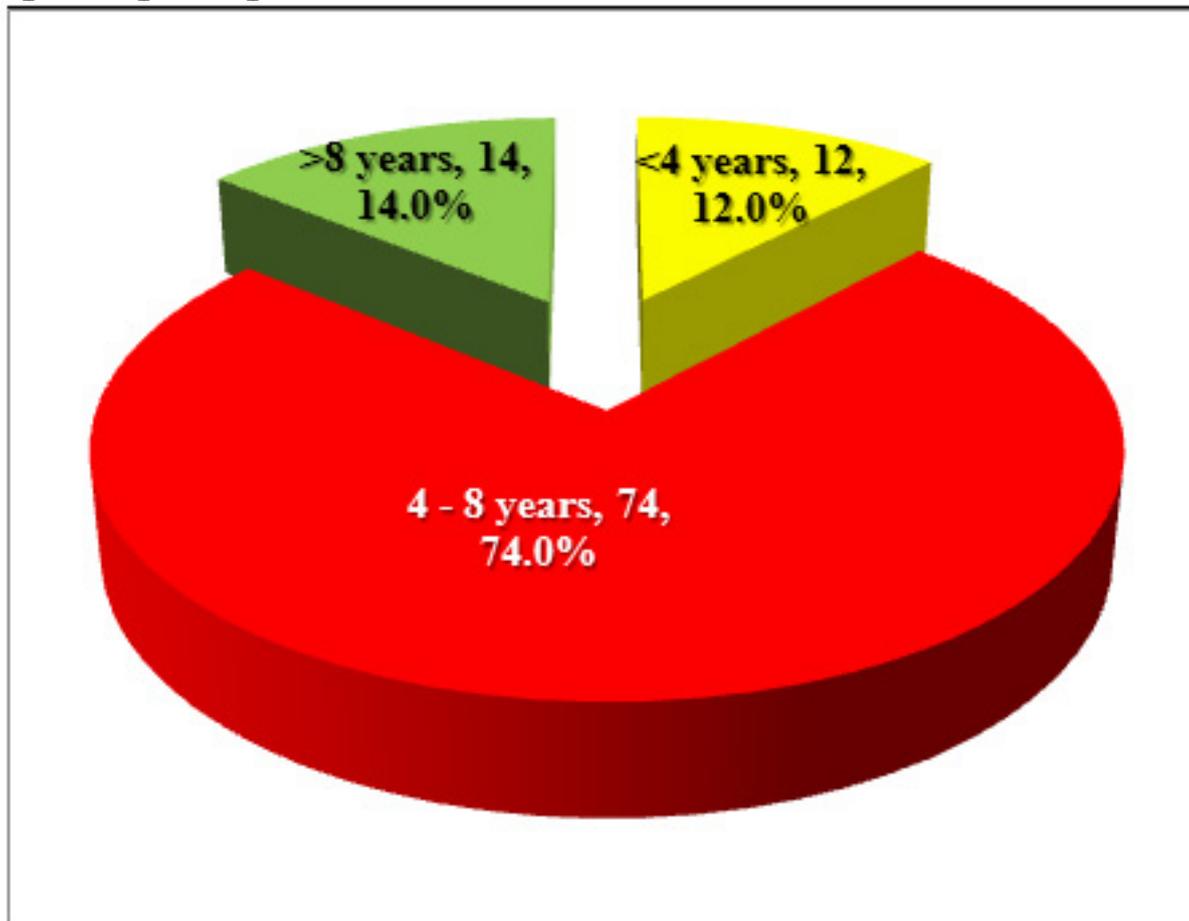
Table 2: Family characteristics of participant autistic compared with non-autistic children

Characteristics`	Non-autistic		Autistic		P Value
	No.	%	No.	%	
No. of siblings					
• 0	1	1.2	4	4.7	
• 1-4	68	80.0	60	69.8	
• 5+	16	18.8	22	25.6	0.198
Mother's educational status					
• Illiterate	9	9.0	13	13.0	
• Primary	9	9.0	10	10.0	
• Intermediate	9	9.0	11	11.0	
• Secondary	43	43.0	34	34.0	
• University	30	30.0	32	32.0	0.718
Father's educational status					
• Illiterate	8	8.0	7	7.0	
• Primary	10	10.0	11	11.0	
• Intermediate	10	10.0	24	24.0	
• Secondary	33	33.0	26	26.0	
• University	39	39.0	32	32.0	0.116
Parents' consanguinity	41	41.0	45	45.0	0.568
Family monthly income					
• <5000 SR	31	31.0	33	33.0	
• 5000-10000 SR	50	50.0	41	41.0	
• >10000 SR	19	19.0	26	26.0	0.360
Family history of autism	7	7.0	7	7.0	1.000

Table 3: Prenatal and natal characteristics of participant autistic compared with non-autistic children

Prenatal Characteristics	Non-autistic		Autistic		P Value
	No.	%	No.	%	
Mother's age at start of pregnancy (Mean±SD)	33.1±5.7		35.1±5.9		0.015
Father's age at start of pregnancy (Mean±SD)	39.7±8.8		42.6±7.7		0.016
Maternal diseases during pregnancy					
• Gestational diabetes	4	4.0	6	6.0	0.506
• Preeclampsia	0	0.0	1	1.0	1.000
• Psychiatric problems	1	1.0	1	1.0	1.000
• Hypothyroidism	5	5.0	4	4.0	1.000
• Anemia	17	17.0	12	12.0	0.359
Mother's intake of unprescribed drugs	5	5.0	4	4.0	1.000
Mother's exposure to smoke	6	6.0	15	15.0	0.038
Fetal problems					
• Breech presentation	2	2.0	4	4.0	0.683
• Meconium staining	5	5.0	4	4.0	1.000
• Fetal hypoxia	6	6.0	5	5.0	1.000
Duration of pregnancy					
• <37 weeks	11	11.0	7	7.0	
• 37-40 weeks	85	85.0	87	87.0	
• >40 weeks	4	4.0	6	6.0	0.519

Table 4: Natal characteristics of participant autistic compared with non-autistic children

Natal Characteristics	Non-autistic		Autistic		P Value
	No.	%	No.	%	
Type of labor					
• Spontaneous vaginal	68	68.0	71	71.0	
• Assisted vaginal	5	5.0	2	2.0	
• Caesarian section (CS)	27	27.0	27	27.0	0.509
– Type of anesthesia for CS:					
– Spinal	9	33.3	4	14.8	
– General	18	66.7	23	85.2	0.111
Child's birth weight					
• <2500 gm	13	13.0	20	20.0	
• 2500-3500 gm	81	81.0	76	76.0	
• >3500 gm	6	6.0	4	4.0	0.360

Table 5: Characteristics of participant autistic compared with non-autistic children after labor

Characteristics`	Non-autistic		Autistic		P Value
	No.	%	No.	%	
Admission to PICU	13	13.0	7	7.0	0.157
Incidence of neonatal jaundice	23	23.0	25	25.0	0.741
Feeding during the first 6 months					
• Breastfeeding	29	29.0	27	27.0	
• Artificial feeding	12	12.0	20	20.0	
• Mixed feeding	59	59.0	53	53.0	0.302

Discussion

Autism constitutes a group of neurodevelopmental disorders, which are manifested by persistent impairment in social communication and interaction and restricted and repetitive patterns of behavior, interests, or activities (17). It is the leading mental cause of disability among children aged under five years, and accounts for about 8 million disability adjusted life years (18).

Most cases of autism remain of unknown etiology (5). Nevertheless, new technologies and large population-based epidemiological studies could shed some light on the possible risk factors for its etiology (19).

The present study followed a case control research design aiming at identifying risk factors associated with autism among autistic children in Makkah Al-Mukarramah City.

Regarding the personal characteristics associated with autism, the current study revealed that the mean age for diagnosis of autism was 6.1±2.4 years. Autism was diagnosed among participant autistic children mainly before their eighth year of age.

Daniels and Mandell (20) noted that there is a considerable variation in the age at diagnosis of autism. Hrdlicka et al. (21) reported a mean age at diagnosis of 6.2±2.7 years, while Kurasawa et al. (22) reported a mean age of 7.2±4.2 years. In the National Survey of Children's Health, USA, Rydzewska et al. (23) reviewed that 24.6% of autistic children were diagnosed before their third year of age, while 44.5% were diagnosed at 3–5 years and 30.9% were diagnosed after the age of five years. Therefore, it is important to screen children, especially boys, for autism by the primary care physicians, during their visits to the well-baby clinics, as well as at school entry by the school health physician.

This study showed a female:male ratio of about 1:3. However, autistic and non-autistic children did not differ significantly according to their age groups, nationality, birth order, or according to their family characteristics (i.e., number of siblings, parents' educational status, consanguinity, monthly income or family history of autism).

These findings are in accordance with that reported by Kurasawa et al. (22), who found a female-to-male ratio of 1:3 among autistic children, while Honda et al. (24) reported a female-to-male ratio of 1:2.5.

Halladay et al. (25) noted a wide variability in this female-to-male ratio from 1:2 to 1:7. However, the most commonly reported ratio in literature is 1:4. This 1:4 ratio seems to represent a consistent finding in almost all epidemiological studies conducted in different countries, at different times, and using different diagnostic criteria (14).

Several genetics studies have displayed patterns of risk variations consistent with a protective effect against the autism phenotype in females (26-29). However, the neuro-developmental, cellular and molecular aspects by which these factors determine the risk for autism are still not fully understood (30).

Maternal educational level higher than secondary school was a significant risk factor for autism (31). Moreover, socioeconomic status was reported by some to be a significant risk factor for autism (32). However, this association has been denied by Delobel Ayoub et al. (33), who attributed difference in incidence of autism according to socioeconomic status to the accompanied healthcare disparity, as children in families with higher socioeconomic status are more likely to receive health care and subsequently more likely to be diagnosed.

Regarding prenatal characteristics of children, the current study revealed that mothers of autistic children were significantly more exposed to smoke than those of non-autistic children.

Several researchers reported significant associations between autism and exposure of pregnant mothers to smoke or tobacco use (30; 34-35).

However, it is to be noted that the exposure to smoke by children who developed autism cannot be decided whether being prenatal or after birth. It is difficult to distinguish active smoking by pregnant mothers, or their passive exposure to smoke and exposure of children to smoke after birth (36).

Khalil et al. (31) stated that although prenatal exposure to tobacco smoke is associated with behavioral problems, exposure to smoke during infancy and early childhood can be more hazardous to the child's developing brain than prenatal exposure. Furthermore, exposure of children to smoke is common and usually continues for longer periods than the nine months' exposure during pregnancy.

Park et al. (37) added that home environment tends to be similar prenatally and postnatally. Eskenazi and Castorina (38) reported adverse neurocognitive development among children who were passively exposed to smoke after birth compared to those who were only passively exposed to smoke in utero. Moreover, exposure of the fetus to smoke passes through the protective placental barrier; while postnatal exposure of the child to smoke occurs through direct inhalation (39).

Gardener et al. (5) stated that prenatal risk factors have been assessed by many epidemiologic studies for the association with autism. Some studies supported the hypothesis that obstetrical complications may potentiate the risk for developing autism. However, the specific complications, magnitude of effect, and the overall conclusions of these studies were mostly inconsistent, possibly due to methodological variations (40).

Advanced parents' age at birth of their children in the present study were significantly associated with autism.

These findings are in accordance with those reported by some other studies, which showed increased maternal age as being associated with autism, and also being associated with chromosomal abnormalities and obstetric complications (41-43).

Research provided a growing evidence for the hypothesis that mutations contribute to the association between advanced paternal age and autism (44). On the other hand, older maternal age has been associated with chromosomal changes (45-46); and genomic modifications (47).

Reichenberg et al. (48) suggested that the association between older fathers' age and autism among their children can be due to imprinted genes, de novo spontaneous mutations that accumulate with advancing age in spermatagonia.

However, since both mother's age and father's age are positively and strongly correlated, it has been suggested that it is possible to consider that advanced maternal age only or paternal age only is the one that is etiologically relevant. Therefore, to counterbalance any possible confounding, controlling for maternal age, showed that significant associations for paternal age at birth with autism were still observed (48; 32), while controlling for paternal age, the relative risk for older maternal age with autism was not statistically significant (odds ratio = 1.06, p=0.08 (5). Therefore, Sandin et al. (49) suggested that fathers' older age may be more associated with the risk of development of autism among their children than advancing maternal age.

Finally, Khalil et al. (31) stressed that the exact etiology for autism remains not clear. Both environment and genes possibly play an important role. Autism is most probably a heritable disorder. However, in monozygotic twins, there is almost 70% concordance. This suggests that nongenetic factors, e.g., environmental (prenatal and perinatal) factors (prenatal and perinatal) also play a significant role (4). Several sociodemographic factors that have been reported by some studies to be associated with autism include advanced parents' age, family socioeconomic status, prematurity, low birth weight. Some of these risk factors have been previously studied. Only a few risk factors were consistently associated with autism (4; 9; 33; 41-43).

It is currently believed that the mechanism underlying autism etiology is most likely polygenic and potentially epistatic, and that environmental factors may interact with genetic factors to increase risk (50-51).

Study limitations
This study was conducted in a limited local area, i.e., Makkah Al-Mukarramah City. Therefore, the generalization of its results should be cautiously considered. Moreover, it followed a case-control research design, with its main drawbacks of being prone to selection and recall bias (52).

This study concluded that most autistic children become diagnosed at 4-8 years old. The female:male ratio among autistic children is about 1:3. Advanced parental age is a significant risk factor for autism among their children. Exposure of mothers to smoke is a risk factor for autism among her children. Therefore, it is recommended to screen children, especially boys, for autism during their visits to the well-baby clinics and at school entry. Avoidance of exposure of pregnant mothers and children to smoke. Provision of health education to parents about autism and the importance of avoiding pregnancy at advanced parent ages. The conduction of further, nationwide studies on risk factors for autism, with prospective study design with larger sample sizes.

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Does increased Body Mass Index increase the risk of recurrent pregnancy loss?

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Abstract

Background: Obesity is a worldwide health problem. It is also associated with maternal and fetal outcome, such as sudden and unexplained intrauterine death, and diabetes, and polycystic ovary syndrome (PCOS). Little is known about the relation of obesity and recurrent pregnancy loss. This study aimed to assess the relation and impact of obesity on the risk of recurrent pregnancy loss.

Patient and methods: A cross sectional study was done in gynecology and obstetrics department in Azadi Teaching Hospital during 1st May 2019-1st August 2019. We randomly selected 402 patients of reproductive age. Data was obtained through standardized questionnaire including obstetrical , medical and surgical history information. BMI was divided according to the the WHO criteria: underweight <19, normal (19±24.9), over weight (25-29.9), and obese women (BMI >30).

Results: The prevalence of recurrent miscarriage was 24 (6%); those who had 1-2 miscarriages was 165 (41%). Recurrent miscarriage was significantly common among those aged ≥31 years 15 (9.9%), followed by 25-30 years 7(5.4%), and < 18 years 1 (3.4%). It was significantly common among obese 10 (12.7%), overweight 8 (4.5%) women, and underweight 1 (4.3).

Recurrent pregnancy loss was not significantly more among those who had ≥5 children 2 (12.5%) than those had 0-1 children14 (6.1%). Risk to have 1-2 miscarriages was significantly 0.3 times among those aged <18 years than those aged 19-30 years, and those who had 2-4 children 1.6 times than those had 0-1 children . Recurrent miscarriage was significantly 3.6 times more among obese women as compared with normal weight women, and 3.2 times among those aged ≥31, as shown in Table 4.

Conclusion and recommendation: Obesity was significantly associated with increased risk of RPL. It is important to recommend females with recurrent pregnancy loss to decrease weight in order to get better results.

Key words: recurrent miscarriage, recurrent pregnancy loss, obesity, overweight, BMI

Introduction

The definition of recurrent miscarriage is the manifestation of three or above sequential miscarriages and is one of the great distressing untoward reproductive outcomes influencing about 1% of fertile couples [1, 2]. Fifty percent of cases of recurrent miscarriage are of unknown etiologies, adding to the associated distress. The other 50% of cases are due to a number of identifiable causes: chromosomal, uterine, coagulation, and immunological causes [2, 3]. Increased BMI (obesity), which has been associated with a number of adverse pregnancy outcomes, is of increasing prevalence [4,5]. Several studies revealed an association between obesity and miscarriage [6–8], which may be due to adverse influences on the embryo, the endometrium, or both [9]. From the assessment of evidence from several studies that discuss the relation between miscarriage and obesity, we found that obese females have a significant increased risk of miscarriage regardless of the conception method [10]. Unfortunately, still the influence of obesity on the risk of recurrent miscarriage, and the association between the various degrees of obesity and miscarriage rates has not so far been studied. The aim of this study is to assess the relation and impact of obesity on the risk of miscarriage.

Patients and Methods

Cross sectional study was done in gynecology and obstetrics department in Azadi Teaching Hospital during the period 1st May 2019-1st August 2019. Detailed information was taken from the patient through comprehensive questionnaire including information about obstetrical, medical and surgical history obtained from the patients.

Randomly selected 402 patients in reproductive age were interviewed in the obstetrics and gynecology department.

Recurrent pregnancy loss (RPL), is defined as 3 consecutive pregnancy losses prior to 20 weeks from the last menstrual period [11].

The body mass index (BMI) of all mothers was calculated using the formula (weight in kg/(height in meters)2.

BMI was divided according to the the WHO criteria: underweight <19, normal (19±24.9), over weight (25-29.9), and obese women (BMI >30).

Data entry and analysis was done using SPSS -25. The significance of differences between the groups was analyzed using Chi-square test; and odds ratio used to calculate the risk using logistic regression. p<0.05 was considered statistically significant.

Results

The prevalence of recurrent miscarriage was 24(6%), those who had 1-2 miscarriages was 165(41%), as shown in Figure 1.

Recurrent miscarriage was common among those aged ≥31 years 15 (9.9%), followed by 25-30 years 7(5.4%), and < 18 years 1 (3.4%), This relation was statistically significant as shown in Table 1.

Recurrent miscarriage was common among those obese women 10(12.7%), followed by overweight 8(4.5%), and underweight1 (4.3%), respectively. This relation was statistically significant as shown in Table 2.

Recurrent miscarriage was commonly found among those who had ≥5 children 2 (12.5%) than those had 0-1 children 14(6.1) This relation was statistically not significant as shown in Table 3.

Logistic regression of number of abortions shows that risk to have 1-2 miscarriages was significantly 0.3 times more among those aged <18 years than those aged 19-30 years, and those who had 2-4 children 1.6 times than those who had 0-1 child.

Recurrent miscarriage was significantly 3.6 times more among obese women as compared with normal weight women, and 3.2 times more among those aged ≥31, as shown in Table 4.

Table 1: The distribution of patients according to number of miscarriages and age.

Age	Miscarriage 0	1-2	>3	Total
<18 year	23	5	1	29
	79.3%	17.2%	3.4%	100.0%
18-24	56	36	1	93
	60.2%	38.7%	1.1%	100.0%
25-30	64	58	7	129
	49.6%	45.0%	5.4%	100.0%
≥31	70	66	15	151
	46.4%	43.7%	9.9%	100.0%
Total	213	165	24	402
	53.0%	41.0%	6.0%	100.0%

X^2=19.188, df= 6, P value =0.0

Figure 1. The prevalence of abortion
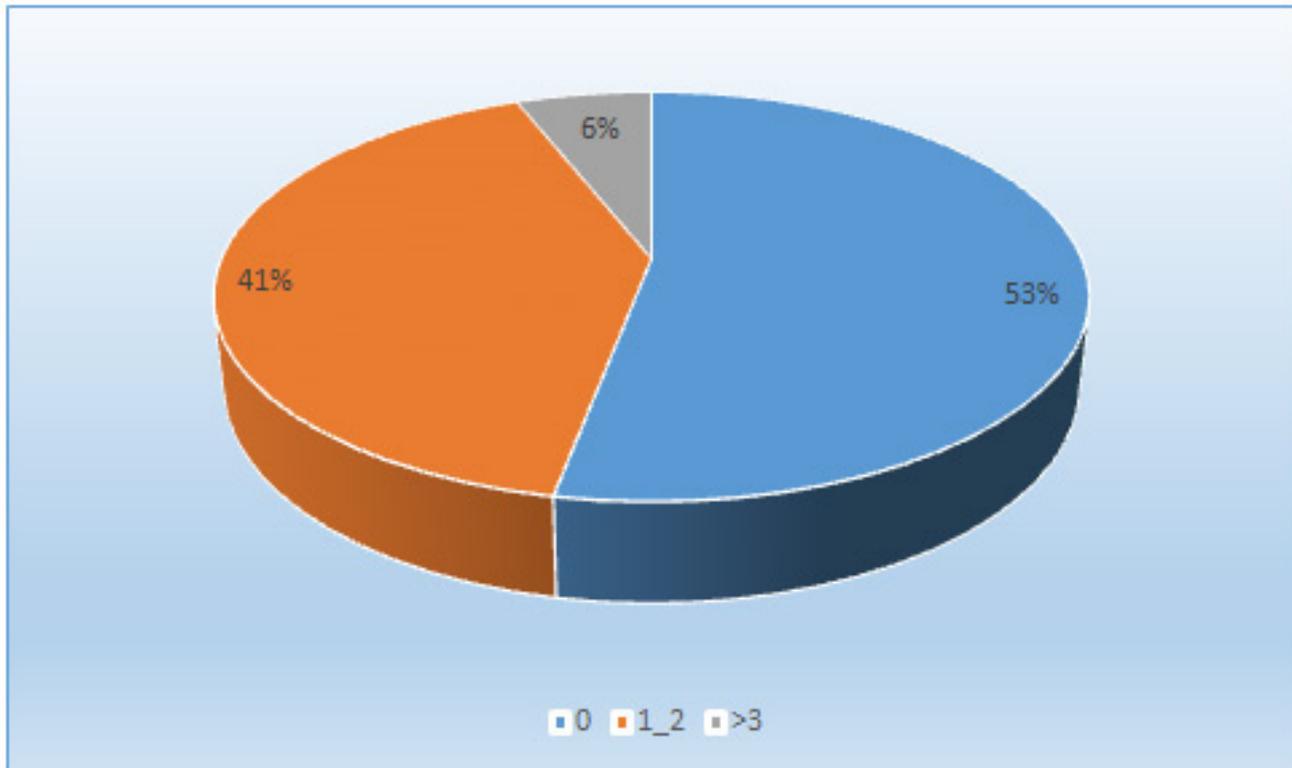
Table 2: The distribution of patients according to number of miscarriages and BMI

| BMI | Miscarriage | | | |
	0	1-2	>3	Total
19-24.9	61	55	5	121
	50.4%	45.5%	4.1%	100.0%
<19	10	12	1	23
	43.5%	52.2%	4.3%	100.0%
25-29.9	108	63	8	179
	60.3%	35.2%	4.5%	100.0%
>30	34	35	10	79
	43.0%	44.3%	12.7%	100.0%
Total	213	165	24	402
	53.0%	41.0%	6.0%	100.0%

X^2=14.188, df=6, P value =0.028 Significant

Table 3: The distribution of patients according to number of miscarriages and number of live births

| No. of live births | Miscarriage | | | |
	0	1-2	>3	Total
0-1	131	83	14	228
	57.5%	36.4%	6.1%	100.0%
2-4	74	76	8	158
	46.8%	48.1%	5.1%	100.0%
≥5	8	6	2	16
	50.0%	37.5%	12.5%	100.0%
Total	213	165	24	402
	53.0%	41.0%	6.0%	100.0%

X^2=6.5, df=4, P value =0.162 Non Significant

Table 4: The logistic regression of different characteristics and number of miscarriages

Variables	1_2		≥3	
	Sig.	OR	Sig.	OR
BMI				
19-24.9		1		1
<19	0.54	1.331	0.862	1.22
25-29.9	0.075	0.647	0.864	0.9
≥30	0.663	1.142	0.03	3.6
Age				
<18 year	0.012	0.3	0.694	0.7
19-30		1		1
≥31	0.4	1.204	0.012	3.2
No. of live births				
0-1		1		1
2_4	0.025	1.6	0.980	1.012
≥5	0.762	1.2	0.311	2.34

Discussion

The prevalence of recurrent miscarriage was 24(6%), with significant association with OR (3.2) for those aged ≥31. This was higher than found by Jauniaux E et al (2.3%) [12].

In Swedish women the incidence of recurrent miscarriage was (0.05%) in women aged 18-42 years and 650 per 100 000 (0.65%) in women who had achieved pregnancy [13].

Recurrent miscarriage was significantly increased with increasing age, mostly among those aged 31 years and more (9.9%). This goes with previous studies that found the risk of recurrent miscarriage increased with increasing age [14][15]. This may be due to fetal chromosomal abnormality [16,17] .

Recurrent miscarriage was common among obese women 10 (12.7%), 3.6 times increased risk, than non-obese women compared with normal weight women. This was supported by previous studies that found obese women had higher percentage of recurrent miscarriage (59%), with OR 1.7 times more than normal and overweight patients [18].

Boots C E et al found similar results, (16.6%) of obese women had miscarriage, with risk of (1.3) times of having multiple pregnancy loss [19].

In 2004, Lashen et al found that obesity was associated with RPL with OR 3.5 of getting RPL [8].

In a meta-analysis of 16 studies, [10] researchers found significant relation between miscarriage and overweight and obesity, regardless of the method of conception (IVF or normal). The pooled OR of obese women to get RPL was (1.67, 95% CI 1.25–2.25).

In a retrospective study done in England, a significant increased risk of RPL among obese women was documented [20].

The explanation of the association between RPL and obesity may be due to the fact that many endocrine disorders are associated with obesity such as PCOS, diabetes and thyroid disease, all of which are risk factors of RPL [21].

The oocyte quality, embryo development, and endometrial receptivity, which are important in normal conception are controlled by the hypothalamic–pituitary– gonadal hormonal axis. The abnormality of this axis in obese women may be the cause of RPL   [22].

In a meta-analysis study, the immunopathological pathways seem to be responsible for pregnancy loss among overweight and obese women. [23].

Many studies have linked the cause to the immunological factor depending on the fact that obesity is associated with high levels of C-reactive protein (CRP) and interleukin-6 (IL- 6) [24-26].

Leptin production stimulates the expression of matrix metalloproteinase by the cytotrophoblast. [27], and modulating the function of local T lymphocytes and proto-oncogenes [28].

Women with RPL had lower serum Leptin levels, and obesity is associated with leptin resistance and deficiency [29, 30].

Conclusion and recommendation

Obesity was significantly associated with increased risk of RPL, therefore it is important to assess the BMI of the patient with RPL and recommend them to decrease weight in order to get better results.

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Quality of Sleep among General Governmental Secondary School Students in Abha City, Saudi Arabia

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Abstract

Aim of the study: To investigate sleep quality and its associates among secondary school students in Abha City.

Subjects and Methods: A total of 400 secondary school students (200 males and 200 females) in Abha City were included. The Arabic versions of the Pittsburgh Sleep Quality Index and the Athens Insomnia Scale were applied in addition to the socio-demographic and personal characteristics of the participants.

Results: A total of 171 students (42.8%) had poor quality of sleep, while 177 students (44.3%) had insomnia. Prevalence of poor sleep quality was significantly higher among females than males (48% and 37.5%, respectively, p=0.034), and among smokers more than non-smokers (48.8% and 41.3%, respectively, p=0.048), while it did not differ significantly according to students' age, nationality, midterm exam grades, consumption of soft drinks at night, or any of students' family characteristics. Insomnia significantly increased with students' age (p=0.001), while it did not differ significantly according to students' gender, nationality, midterm exam grades, consumption of soft drinks at night, smoking status, or their family characteristics.

Conclusions: Poor sleep quality and insomnia are common among secondary school students in Abha City. Females and cigarette smokers are more prone to poor sleep quality. Insomnia among secondary school students is significantly associated with older age.

Recommendations: The school health program should apply anti-smoking control and health education programs at schools. Parents and teachers should guide children toward regulating their sleep and wake-up times. Delaying school start times may be proposed as a means of allowing students to get adequate sleep.

Key words: Sleep quality, Secondary School Students, Pittsburgh Sleep Quality Index, Athens Insomnia Scale.

Introduction

Adequate sleep in adolescence is important for healthy development and proper daytime functioning. The evidence suggests that disturbances in the quantity and quality of sleep are associated with emotional and behavioral problems, somatic complaints, and overall quality of life among adolescents (1-7).

Sleep is crucial for the learning, memory processes, and school performance of adolescents (8). Adequate sleep has been shown to boost the immune system, which helps to fight infections; thus, sleep may reduce a child's risk of getting sick (9). The psychological health of adolescents can be affected by sleep duration, with shorter sleep durations in adolescents having been linked to depression and an increase in suicide ideation (10).

According to the National Sleep Foundation, in Arlingon, Virginia, USA, the recommended sleep duration for adolescents is 9 hours per night for optimum health and development. Sleep duration is not the only indicator of sleep. Sleep quality and excessive daytime sleepiness are significant indicators of sleep outcome. Sleep quality refers to continuous sleep without any interruption (11).

Sleep disorders are considered when there is repeated difficulty with the initiation, duration, maintenance, or quality of sleep that occurs despite adequate time and opportunity for sleep and results in some form of daytime impairment (1).

Good sleep quality can be characterized by the occurrence of certain conditions such as the early onset of sleep, fewer interruptions, and fewer early awakenings. Good sleep quality is also associated with a wide range of positive outcomes such as better health, greater well-being, and better psychological functioning among adolescents (12). Inadequate or disrupted sleep can directly result in excessive daytime sleepiness. Adolescents with daytime sleepiness are likely to experience reduced alertness, compromised daytime functioning, and impaired mood (3, 13-14).

Since insufficient sleep, poor sleep quality and sleepiness are common problems in children and adolescents, being related to learning, memory and school performance, (3-4) the present study aimed to investigate sleep quality and its associates among secondary school students in Abha City, Saudi Arabia.

Subjects and Methods

This study was conducted during the academic year 2018-2019 at general secondary governmental schools in Abha City, Saudi Arabia.

Study design:
A cross-sectional analytical study design was followed. A multistage stratified random sample was applied by selecting schools and students from the Directorate of Education in Abha City. Four governmental general secondary schools were ran¬domly selected (two for boys and two for girls) by drawing the names of schools from the sampling frame. After that, five classes of students were randomly selected from each school using a simple random sampling technique (one class for the first scholastic grades; two classes for the second scholastic grade (one Scientific branch and one Arts branch); and two classes for the third scholastic grade (one Scientific branch and one Arts branch). All students in a selected class were invited to participate in the study. A total of 400 students (200 boys and 200 girls) were included in this study.

A study questionnaire was designed by the researchers. It included three parts as follows:
1- Socio-demographic characteristics: Student's age, parental education and occupation, number of siblings, nationality, smoking status, intake of certain beverages before sleep (i.e., tea, coffee, soft drinks, power drinks), use of mobile phones at night, past history of any medical or psychiatric disorders.
2- The Arabic version of Pittsburgh Sleep Quality Index (PSQI): It measures the quality and patterns of sleep. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. Scoring of answers is based on a 0 to 3 scale, whereby 3 reflects the negative extreme on the Likert Scale. A global sum of "5" or greater indicates a "poor" sleeper. Reliability and validity of PSQI produced a sensitivity of 89.6% and a specificity of 86.5% of patients versus control subjects. This cutoff score correctly identified 84% of patients with disorders of initiating or maintaining sleep, 89% of patients with disorders of excessive sleepiness, and 97% of depressed patients (15) .
3- The Arabic version of Athens Insomnia Scale: This is a validated self-assessment psychometric instrument designed for quantifying sleep difficulty based on the ICD-10 criteria. It consists of eight items; the first five pertain to sleep induction, awakenings during the night, final awakening, total sleep duration, and sleep quality; while the last three refer to well-being, functioning capacity, and sleepiness during the day. Regarding internal consistency, Cronbach's alpha was around 0.90 and the mean item-total correlation coefficient was about 0.70. Moreover, in the factor analysis, the scale emerged as a sole component. The test-retest reliability correlation coefficient was found at almost 0.90 at a 1-week interval. As far as external validity is concerned, the correlation of the Athens Insomnia Scale with the Sleep Problems Scale was 0.90. A score of 6 as the optimum cut-off based on the balance between sensitivity and specificity. When diagnosing individuals with a score of 6 or higher as insomniacs, the scale presents with 93% sensitivity and 85% specificity (90% overall correct case identification). For this cut-off score, in the general population, the scale has a positive predictive value of 41% and a negative predictive value of 99% (16).

A pilot study was carried out, on a purposive sample of 30 secondary school students (15 boys and 15 girls) from schools that were not included in the main study. Their data were used for testing the feasibility of the study and to assess clarity of questions. However, these data were not included into the main data of the study.

This study was fully self-funded by the researchers. Prior to data collection, all the necessary official approvals were fulfilled. During data collection, participant students were informed that their responses were considered fully confidential and anonymous, and any student was free to withdraw from participating in this study at any time without being exposed to any penalty. The researchers then collected the completed questionnaire sheets.

Data entry and analysis were performed using the Statistical Package for Social Sciences (SPSS version 23). Descriptive statistics were calculated, in the form of frequency and percentage for categorical data. Testing significance was performed by applying the chi-square test. Differences were considered as statistically significant when the p-values were less than 0.05.

Results

Table (1) shows that the age of about one quarter of students (28.7%) was 15-16 years, while about two thirds of them (64.3%) were aged 17-18 years and 7% were more than 18 years old. Most participant students were Saudi (73%). About one quarter of students (24.8%) obtained excellent grades in their midterm exam, 31.5% had very good grades, while 3% failed. About one third of students (34.3%) used to have certain beverages (i.e., Soft drinks, power drinks, coffee or tea) at night, while 8.5% of students were smokers.

Table (2) shows that about half of students (46.8%) had 1-2 siblings, while 33.3% had 3-4 siblings. The educational level of most students' fathers was either secondary (25.8%) or university (41.8%). On the other hand, 13.3% of mothers were illiterate, 15.5% had primary education, 15.3% had secondary education and 39.3% had university education. Almost one third of students' fathers were retired (31%) and 30.3% were military personnel, and that of 4.3% was health-related. About one third of students' mothers (31.8%) were employed. The monthly family income of almost half of students (47.8%) was ≥10,000 SR.

Figure (1) shows that 171 students (42.8%) had poor quality of sleep.

Table (3) shows that prevalence of poor sleep quality was highest among students aged 17-18 years (43.6%). However, quality of sleep did not differ significantly according to students' age groups. Prevalence of poor sleep quality was significantly higher among female than male students (48% and 37.5%, respectively, p=0.034). Prevalence of poor sleep quality was higher among Saudi students than non-Saudi students (43.2% and 41.7%, respectively). However, quality of sleep did not differ significantly according to students' nationality. Prevalence of poor sleep quality was highest among students who failed at their midterm exam. However, quality of sleep did not differ significantly according to students' grades at their midterm exam. Prevalence of poor quality of sleep was higher among students who consume soft drinks at night than those who do not (44% and 42.1%, respectively). However, students' quality of sleep did not differ significantly according to their consumption of soft drinks at night. Prevalence of poor quality of sleep was significantly higher among students who smoke cigarettes than those who do not smoke (58.8%, 41.3%, respectively, p=0.048).

Table (4) shows that students' quality of sleep did not differ significantly according to their family characteristics

Figure (2) shows that 177 students (44.3%) had insomnia.

Table (5) shows that prevalence of insomnia among secondary school students significantly increased with their age group (p=0.001). However, prevalence of insomnia did not differ significantly according to their gender, nationality, grades of their midterm exam, or consumption of certain beverages (i.e., soft drinks, power drinks, tea or coffee) at night or smoking status.

Table (6) shows that students' quality of sleep did not differ significantly according to their family characteristics.

Table 1: Personal characteristics of study sample

Personal characteristics	No.	%
Age (years)		
• 15-16 years	115	28.7
• 17-18 years	257	64.3
• > 18 years	28	7.0
Nationality		
• Saudi	292	73.0
• Non-Saudi	108	27.0
Midterm Grade		
• Fail	12	3.0
• Pass	19	4.8
• Good	144	36.0
• Very Good	126	31.5
• Excellent	99	24.8
Intake of certain beverages at night[1]	141	35.3
Smoking cigarettes	34	8.5

(1) Soft drinks, power drinks, coffee or tea

Figure 1: Students' sleep quality

Poor, 171, 42.8%

Good, 229, 57.3%
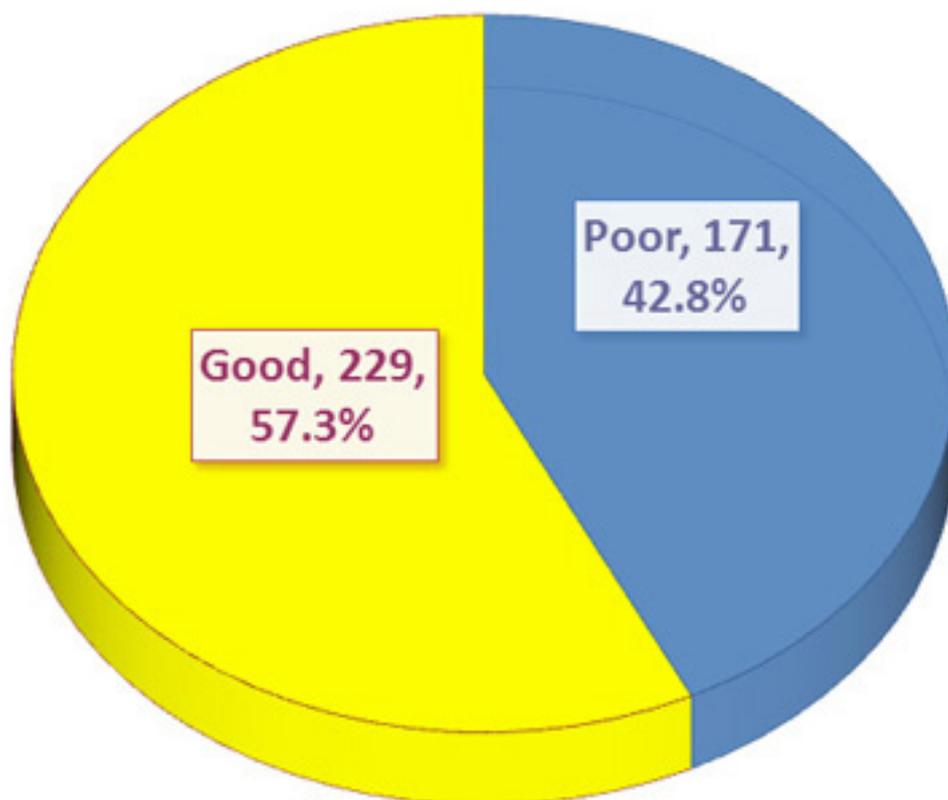
Table 2: Family characteristics of study sample

Family characteristics	No.	%
No. of siblings		
• 0	28	7.0
• 1-2	187	46.8
• 3-4	133	33.3
• 5+	52	13.0
Father's educational level		
• Illiterate	22	5.5
• Primary	51	12.8
• Intermediate	57	14.2
• Secondary	103	25.8
• University	167	41.8
Mother's educational level		
• Illiterate	53	13.3
• Primary	62	15.5
• Intermediate	61	15.3
• Secondary	67	16.8
• University	157	39.3
Father's occupation		
• Retired	124	31.0
• Military	121	30.3
• Governmental	60	15.0
• Health related	17	4.3
• Private sector	46	11.5
• Others	32	8.0
Mother's employment		
• Unemployed	273	68.3
• Employed	127	31.8
Monthly family income		
• <10000 SR	209	52.3
• ≥10000 SR	191	47.8

Table 3: Students' quality of sleep according to their personal characteristics

Personal characteristics	Good		Poor		p
	No.	%	No.	%	value
Age (years)					
• 15-16 years	67	58.3	48	41.7	
• 17-18 years	145	56.4	112	43.6	
• >18 years	17	60.7	11	39.3	0.879
Gender					
• Male	125	62.5	75	37.5	
• Female	104	52.0	96	48.0	0.034
Nationality					
• Saudi	166	56.8	126	43.2	
• Non-Saudi	63	58.3	45	41.7	0.790
Midterm exam grade					
• Fail	3	25.0	9	75.0	
• Pass	12	63.2	7	36.8	
• Good	87	60.4	57	39.6	
• Very Good	69	54.8	57	45.2	
• Excellent	58	58.6	41	41.4	0.174
Intake of certain beverages at night[1]					
• Yes	79	56.0	62	44.0	
• No	150	57.9	109	42.1	0.716
Smoking status					
• Smoker	14	41.2	20	58.8	
• Nonsmoker	215	58.7	151	41.3	0.048

(1)   Soft drinks, power drinks, coffee or tea

Figure 2: Prevalence of insomnia among students
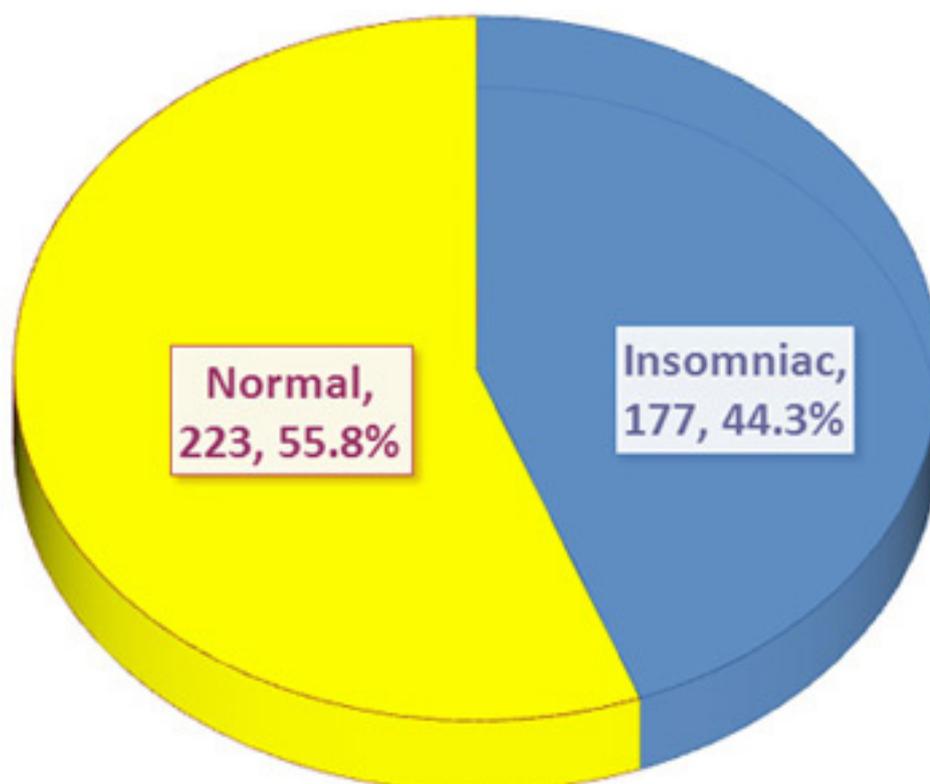
Table 4: Students' quality of sleep according to their family characteristics

Family characteristics	Good		Poor		p value
	No.	%	No.	%	
No. of siblings					
• 0	13	46.4	15	53.6	
• 1-2	118	63.1	69	36.9	
• 3-4	68	51.1	65	48.9	
• 5+	30	57.7	22	42.3	0.112
Father's educational level					
• Illiterate	11	50.0	11	50.0	
• Primary	27	52.9	24	47.1	
• Intermediate	31	54.4	26	45.6	
• Secondary	57	55.3	46	44.7	
• University	103	61.7	64	38.3	0.637
Mother's educational level					
• Illiterate	24	45.3	29	54.7	
• Primary	35	56.5	27	43.5	
• Intermediate	35	57.4	26	42.6	
• Secondary	38	56.7	29	43.3	
• University	97	61.8	60	38.2	0.349
Father's occupation					
• Retired	57	46.0	67	54.0	
• Military	75	62.0	46	38.0	
• Governmental	36	60.0	24	40.0	
• Health related	12	70.6	5	29.4	
• Private sector	27	58.7	19	41.3	
• Others	22	68.8	10	31.3	0.057
Mother's employment					
• Unemployed	159	58.2	114	41.8	
• Employed	70	55.1	57	44.9	0.557
Monthly income					
• <10000 SR	111	53.1	98	46.9	
• >10000 SR	118	61.8	73	38.2	0.080

Table 5: Prevalence of insomnia among students according to their personal characteristics

Personal characteristics		Normal		Insomnia		p value
		No.	%	No.	%	
Age (years)						
•	15-16 years	79	68.7	36	31.3	
•	17-18 years	134	52.1	123	47.9	
•	>18 years	10	35.7	18	64.3	0.001
Gender						
•	Male	110	55.0	90	45.0	
•	Female	113	56.5	87	43.5	0.763
Nationality						
•	Saudi	156	53.4	136	46.6	
•	Non-Saudi	67	62.0	41	38.0	0.124
Midterm Grade						
•	Fail	9	75.0	3	25.0	
•	Pass	12	63.2	7	36.8	
•	Good	83	57.6	61	42.4	
•	Very Good	62	49.2	64	50.8	
•	Excellent	57	57.6	42	42.4	0.313
Intake of certain beverages at night(1)						
•	Yes	77	54.6	64	45.4	
•	No	146	56.4	113	43.6	0.735
Smoking status						
•	Smoker	14	41.2	20	58.8	
•	Nonsmoker	209	57.1	157	42.9	0.074

(1) Soft drinks, power drinks, coffee or tea

Discussion

This study revealed that 42.8% of secondary school students in Abha City had poor quality of sleep, while 44.3% had insomnia.

Quach et al. (17) reported that sleep problems among schoolchildren are common. However, several studies reported different rates for sleep problems among school children. Amintehran et al. (18) reported that sleep problems are experienced by 25-30% of adolescents in Tehran, Iran. In Istanbul, Turkey, Dag and Kutlu (19) found that 36.4% of secondary school students had poor sleep quality. In Gombak district, Selangor, Malaysia, Kesintha et al. (20) reported that prevalence of poor sleep quality among secondary school students was 24%. In USA, Wheaton et al. (21) reported that secondary school students did not sleep enough hours, experienced poor sleep quality, and experienced negative consequences for these behaviors.

The consistency between findings of the present study and those of several other studies in different countries, with different cultures, indicate that poor sleep quality is a common and important public health problem that necessitates urgent attention.

Hirshkowitz et al. (22) emphasized that adolescents aged 14–17 years should sleep 8–10 hours per night. The Adolescent Sleep Working Group (23) recommended that to help ensure that adolescents get adequate sleep, they can practice good sleep hygiene (i.e., habits that promote good sleep). Early school start times contribute to insufficient sleep among adolescents. Delaying school start times has been proposed as a means of allowing adolescents to get adequate sleep.

Results of the present study showed that prevalence of poor sleep quality and insomnia differed significantly according to some personal characteristics, but they did not differ significantly according to students' family characteristics, nationality, or their grades of midterm exam.

Findings of this study showed that prevalence of poor quality of sleep was significantly higher among female secondary school students in Abha City.

This finding is in accordance with that reported by Dag and Kutlu (19), in Istanbul, Turkey, who reported that prevalence of poor quality of sleep among female secondary school students was significantly higher than that among male students (43.9% and 30.9%, respectively, p<0.01). Kesintha et al. (20), in Malaysia, who reported that prevalence of

poor quality of sleep among female secondary school students was significantly higher than that among male students (28.1% and 21.3%, respectively, p=0.012).

Hysing et al. (24) stated that, during adolescence, there is increased prevalence of insomnia among females. This higher prevalence of insomnia among females has been explained by Krishnan et al. (25), who noted that, there is no difference between boys and girls in incidence of insomnia before puberty. However, during adolescence, there is more increase in incidence of insomnia among girls than among boys. Moreover, females usually report more sleep-related complaints (26).

Results of this study showed that 8.5% of secondary school students were cigarette smokers. Prevalence of poor quality of sleep was significantly higher among secondary school students who smoke.

This finding is in agreement with those reported by several studies in developing countries, especially Saudi Arabia. Fida and Abdelmoneim (27) noted that despite its decline in developed countries, the rate of smoking in developing countries is still high. Bassiony (28) reported that prevalence of current smoking among school students ranged from 12% to 29.8%. Almutairi (29) noted that prevalence of smoking is high among Saudi students. Mandil et al. (30) added that cigarette smoking is increasing among young people, especially in Gulf nations such as Saudi Arabia.

Therefore, these findings should ring a warning bell that smoking may constitute a sweeping pandemic among adolescents in Saudi Arabia.

Gillum et al. (31) noted that it is interesting to observe how a conservative society such as the Saudi society, where smoking was socially, traditionally, and above all religiously banned, has been affected by the tobacco smoking pandemic to reach such high prevalence levels.

Several studies explained the relationship between tobacco use and sleep problems and difficulties. Hamidovic and de Wit (32) showed that smoking disrupts sleep in two ways. First, as bedtime approaches, the smoker has a final "relaxing" smoke before retiring. That smoke may seem relaxing, but nicotine is actually a stimulant, and smoking cigarettes is almost as sleep disrupting as drinking a cup of coffee. Moreover, smoking disrupts sleep in yet another way. During the night, the smoker goes hours without a cigarette. This leads to discomfort and mild withdrawal, making it difficult to fall into a deep sleep. The light sleep is not sufficient for the smoker to awake refreshed (and struggle with his smoker's cough) in the morning. Isa and El-Sabbagh (33) added that smoking cigarettes causes various respiratory problems and diseases which affect sleep.

Fida and Abdelmoneim (27) argued that, nowadays, about half of the population in Saudi Arabia is thought to be smokers and the country ranks fourth in cigarette import worldwide, with an annual increase of around 3% of tobacco consumption. Meanwhile, there are no regulations to prevent Saudi youth from purchasing or using tobacco, which is being freely sold at a relatively low cost.

The current study revealed that prevalence of insomnia significantly increased with students' age.

Similarly, Jiang et al. (34) found that that prevalence of sleep problems increases with age of adolescents. Moreover, Davidson (35), Ban and Lee (36) and Chung and Cheung (37) noted that age directly affected average weekday sleep length, average weekend day sleep length and overall sleep quality.

Conclusions

Poor sleep quality and insomnia are common among secondary school students in Abha City. Female students are more prone to poor sleep quality than male students. Cigarette smoking is associated with poor sleep quality. Insomnia among secondary school students is significantly associated with older age. Therefore, school health programs should apply appropriate anti-smoking control and health education programs in schools. In class, teachers should explain to their students the importance of adopting a healthy lifestyle, including avoidance of smoking and regulating the times for early going to be bed and wake-up. Parents should guide their adolescent children, especially females, toward regulating their sleep and awakening times. Delaying school start times may be proposed as a means of allowing students to get adequate sleep.

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Case Report: Detection and Excision of Melanoma in Situ in an Australian Primary Care Setting

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Case History

A 65-year-old farmer presented to a Family Practice Clinic in Mundijong, Western Australia which is a semi-rural practice. He had a long-standing skin lesion on his upper back that had recently changed colour, which is a red flag. The patient had a past medical history of Ischemic Heart Disease.

Mechanical Heart Valve and Atrial Fibrillation and was taking Bisoprolol, Atorvastatin, Ramipril and War-farin. He had no allergies. When taking a history and examining a patient one can utilize the ABCDE approach.

Dermoscope used in the diagnosis of Pigmented skin lesions

Background

Melanoma rates in Australia are amongst the highest in the world and there is an increasing global incidence of rates of melanomas. The life time risk is 2.4% in Caucasians [1]. Risk factors for developing a melanoma include phenotypically pale white skin, history of sun burn, UV exposure, the presence of a high number of moles, 1st degree relative with history of invasive cutaneous melanoma and previous personal history of melanoma [2].

Due to the incidence of Skin cancer in Australia, General Practitioners often perform skin checks and consult patients with new or changing skin lesions and these are assessed using history, naked eye examinations and as in this case dermoscopy. Dermoscopy is a magnifying diagnostic instrument that can show features of a melanoma much more clearly than a naked eye exam and hence leads to a more accurate diagnosis of melanoma and early detection [3]. Dermoscopy also leads to reduced unnecessary excisions and secondary care referrals [4].

Dermoscopy

The patient was examined using a dermoscope also known as a dermatoscope. Dermoscopic features were seen suggestive of Melanoma including chaos and clues. Chaos refers to the lack of symmetry and uniformity of the lesion. Features suggestive of melanoma on dermoscopy include brown colour, grey colour, thick lines, eccentric structureless areas and blue grey structures [5].

Excisional biopsy

The skin lesion was excised under local anesthetic in the primary care clinic. An ellipse was drawn around the lesion and the lesion excised and wound sutured. The skin lesion was sent for histopathology. Skin lesion excision is a basic surgical skill often taught on minor surgery skills courses for family medicine physicians.

Histopathology report

The histology report of the skin lesion showed sun damaged skin. An asymmetrical junctional melanocytic proliferation composed of variably sized and shaped nests of melanocytes at the tips of rete ridges, showing bridging. Foci with confluent nests noted. There is an intervening lentiginous component, showing focal confluence. There is extensive pagetoid spread. An intradermal component is not identified. There is papillary dermal fibrosis and features of regression focally. The lesion is 5mm from the lateral margin. The histology was consistent with a Melanoma in Situ arising in a dysplastic naevus which was completely excised.

Margins required

Re-excision of the lesion area was required to ensure adequate margins. Evidence does suggest 5mm margins for a melanoma is sufficient but 10mm margins is more desirable to prevent local recurrence [6]. Hence, a further minor procedure was done with histology showing complete clearance.

Summary

This 65 year old farmer presented with a pigmented skin lesion that was assessed using dermoscopy which suggested features of melanoma. Dermoscopic examination can aid early detection of skin malignancy. An excisional biopsy revealed a Melanoma in situ and a re-excision was conducted to ensure adequate 10mm margins. Primary care can play an important role in the early detection and management of pigmented skin lesions.

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Disseminated Tuberculosis A Rare Presentation

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Abstract

This is a case report of an atypical presentation of disseminated tuberculosis in a forty-one-year-old otherwise healthy female. Although tuberculosis has been known to mankind for centuries and there is a vaccine against the disease and multiple newer antibiotics available in today's world, it is still one of the major causes of morbidity and mortality and its presentation can be deceptive and diagnosis can be difficult.

This is a case report of a 41-year-old female who presented with a short history and acute symptoms that are atypical for tuberculosis.

This case demonstrates the deceptive presentation of this disease and hence importance that clinicians need to be more vigilant, otherwise an important disease that needs timely diagnosis and treatment can be missed.

Key words: Case report, disseminated tuberculosis

Introduction

Tuberculosis (TB) is a disease that is caused by a bacterium Mycobacterium tuberculosis, that is contagious. It can spread one from person to another through coughing, sneezing and breathing in airborne droplets that contain bacteria. It does not spread by sharing utensils shaving or through saliva (1).

TB is one of the oldest recorded human afflictions that has caused human suffering and harm and is still one of the serious life-threatening conditions among the infectious diseases, despite the worldwide use of a live attenuated vaccine called BCG and use of various antibiotics for its treatment.
Two million people die of tuberculosis each year worldwide in spite of BCG vaccine and use of various antibiotics and this clearly demonstrates need for more effective newer vaccines and antibiotics (2).

"Initial symptoms of tuberculosis may include a bad cough that may last three weeks or more, chest pain, bringing up blood or mucus with cough, fatigue, un-intentional weight loss, chills, fever, night sweats and loss of appetite" (3).

"In 2017, an estimated 10 million TB cases were diagnosed, and 1.6 million TB deaths occurred, representing reductions of 1.8% and 3.9% from 2016, respectively" (4).

A recent study in 2018, conducted by WHO (World Health Organization) that shows the total number of cases of tuberculosis in the world, found that the greater incidence occurs in those infected with HIV (Human Immune deficiency Virus), as compared to the normal population It also shows the number of cases resistant to antibiotics against tuberculosis, such as rifampicin and isoniazid, which demonstrates the need for newer medication against this chronic disease. (Figure 1) (5).

According to WHO global and regional report 2018, there were more notified male cases of tuberculosis then female cases throughout the world, with more cases among 15-24 years and 25-34 years Figure 2 (5).

There are certain groups which are more at risk of developing tuberculosis, such as workers or people being cared for in long term care facilities, low income and overcrowded living populations with impaired quality of life. Also, people at high risk of disease are those who are intravenous drug users or have poor immune systems as in those with human immune deficiency virus or who travel to high risk countries or are caring for someone with tuberculosis. All the above increase the risk of direct contact and hence transmission of tuberculosis (6).

WHO Member States — 194
Other countries and territories — 22

ESTIMATES OF TB BURDEN,[a] 2018

	NUMBER (thousands)	RATE (per 100 000 population)
Total TB incidence	10 000 (8 990–11 100)	132 (118–146)
HIV-positive TB incidence	862 (776–952)	11 (10–13)
MDR/RR-TB incidence[b]	484 (417–556)	6.4 (5.5–7.3)
HIV-negative TB mortality	1 240 (1 160–1 320)	16 (15–17)
HIV-positive TB mortality	251 (224–280)	3.3 (2.9–3.7)

Figure -1 Taken from WHO Global & Regional report (5)
MDR is TB resistant to rifampicin and isoniazid; RR is TB resistant to rifampicin.
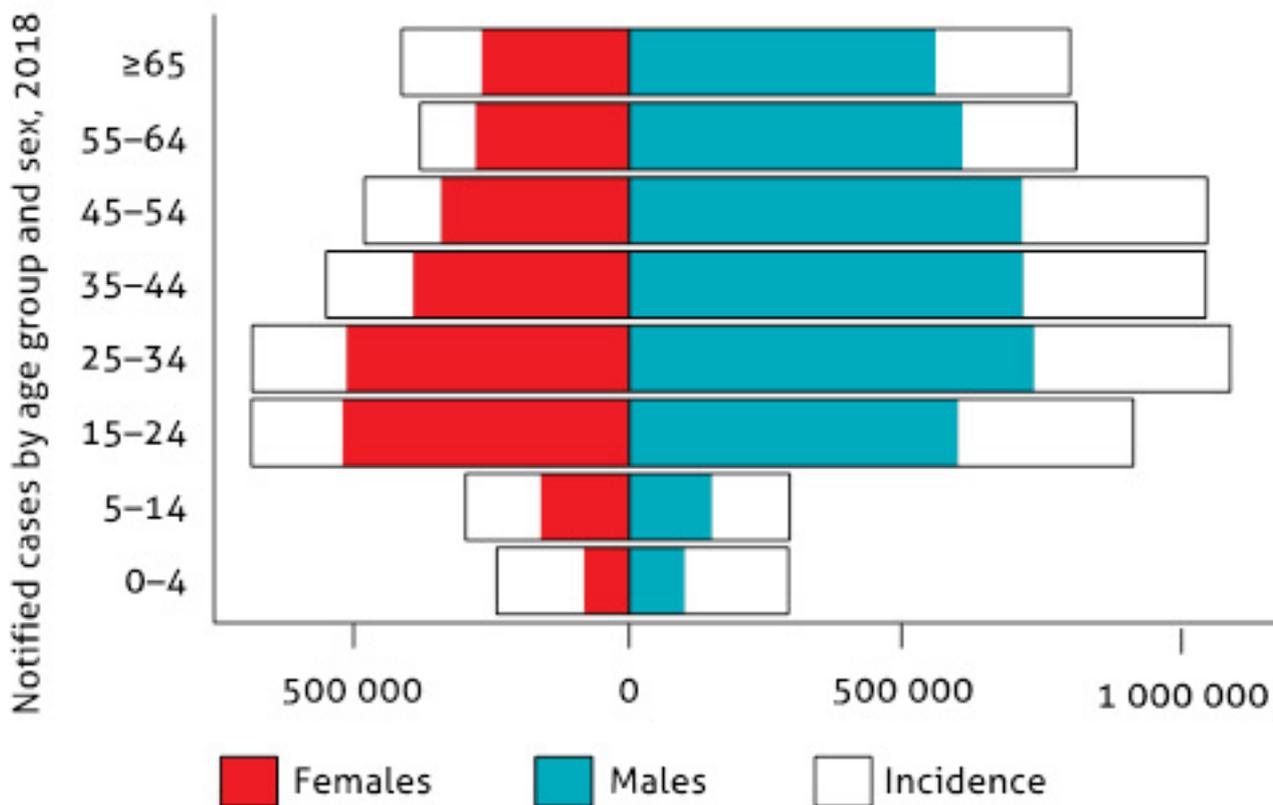
Figure 2 Taken From Who Global And Regional Report 2018.(5)

Case Report

This is a very unusual presentation of a 41-year-old female with disseminated TB. She initially presented to her general practitioner with cough, of acute onset which started 10 days back, and was dry in nature. The patient related her symptoms to the recent house move and possibly allergic in nature. She was a mother of three healthy children with no past medical history, was a non-smoker and had no drug addictions. Originally, she was from France and had recently moved to Qatar.

There was no history of typical tuberculosis symptoms like any fever, sputum, haemoptysis, chest pain, weight loss or night sweats. On examination her doctor noted dullness on percussion on left side of chest and requested a chest x-ray. The chest x-ray showed left sided pleural effusion with possible underlying consolidation and/or collapse of left lung (Figure-3).

The lady was a French national and moved from France to Qatar in June 2018. She visited her doctor in September 2018, three months after her arrival from France. In France she was in contact with her father in law who was getting treatment for suspected brain tuberculosis.

Following her chest x-ray, she was referred to a local hospital for further investigations. She had a Computer Tomography (CT) of chest abdomen and pelvis along with basic blood tests including blood cultures. Her CT showed left pleural effusion, along with consolidation and collapse of left lung with multiple bony lesions detected in spine, which were small paraspinal abscesses.

Cytology of pleural effusion showed lymphocytic effusion that pointed towards possible tuberculosis. A QuantiFERON test was positive.

She had a bronchoscopy along with pleural biopsy to check for malignancy and to confirm the diagnosis of tuberculosis. The pleural biopsy showed necrotizing granulomatous inflammation but was negative for acid fast bacillus. She also had Magnetic Resonance Imaging (MRI) of spine showing multiple vertebral osteomyelitis and small abscesses at prevertebral and paravertebral levels, suggestive of spinal tuberculosis (Figures 4 and 5).

Figure 3: Plain chest x-ray showing left sided pleural effusion with possible consolidation / collapse
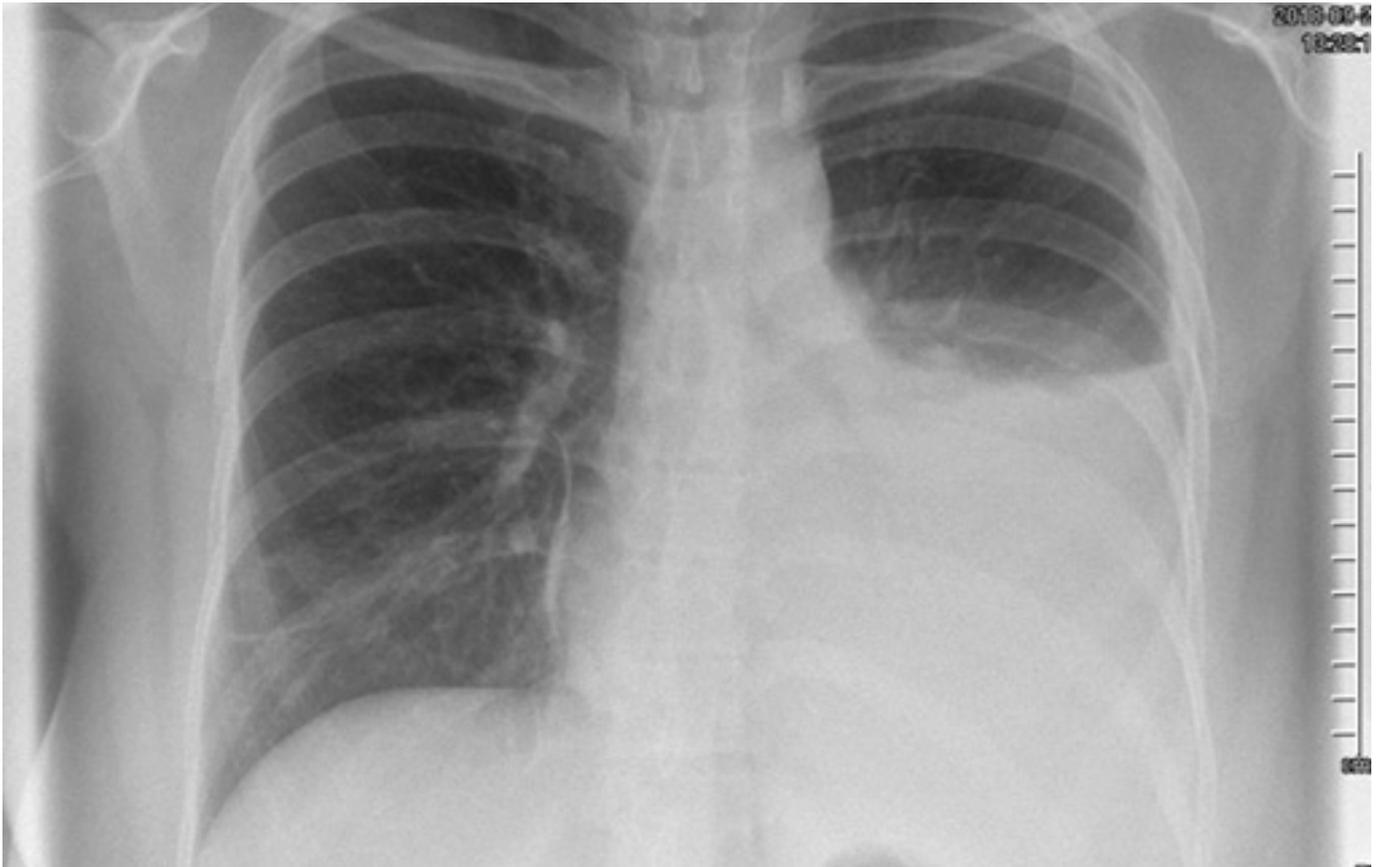
Figure 4: Showing Multiple Paravertebral abscesses.
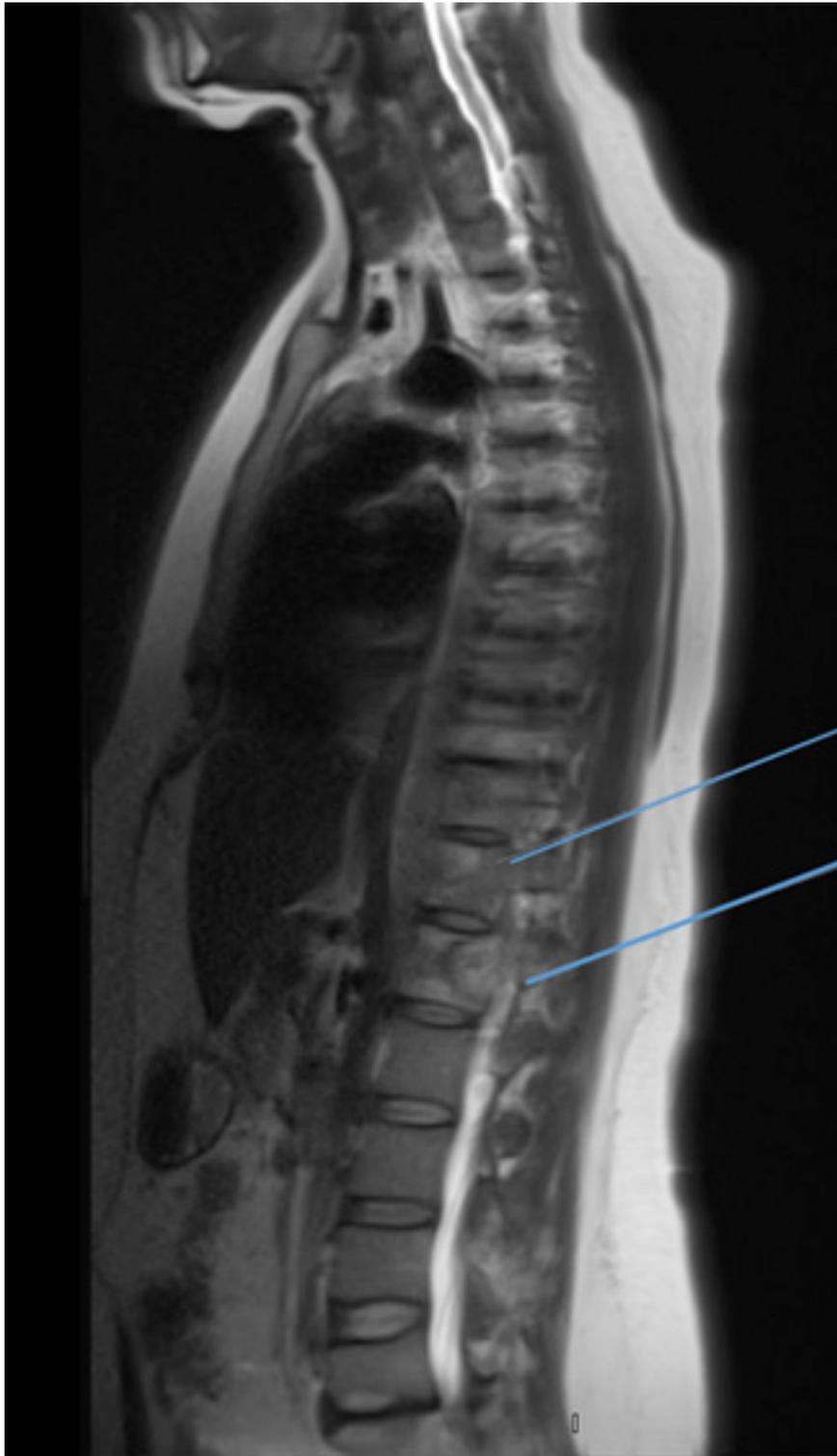
Figure 5: Showing Multiple Paravertebral abscesses.
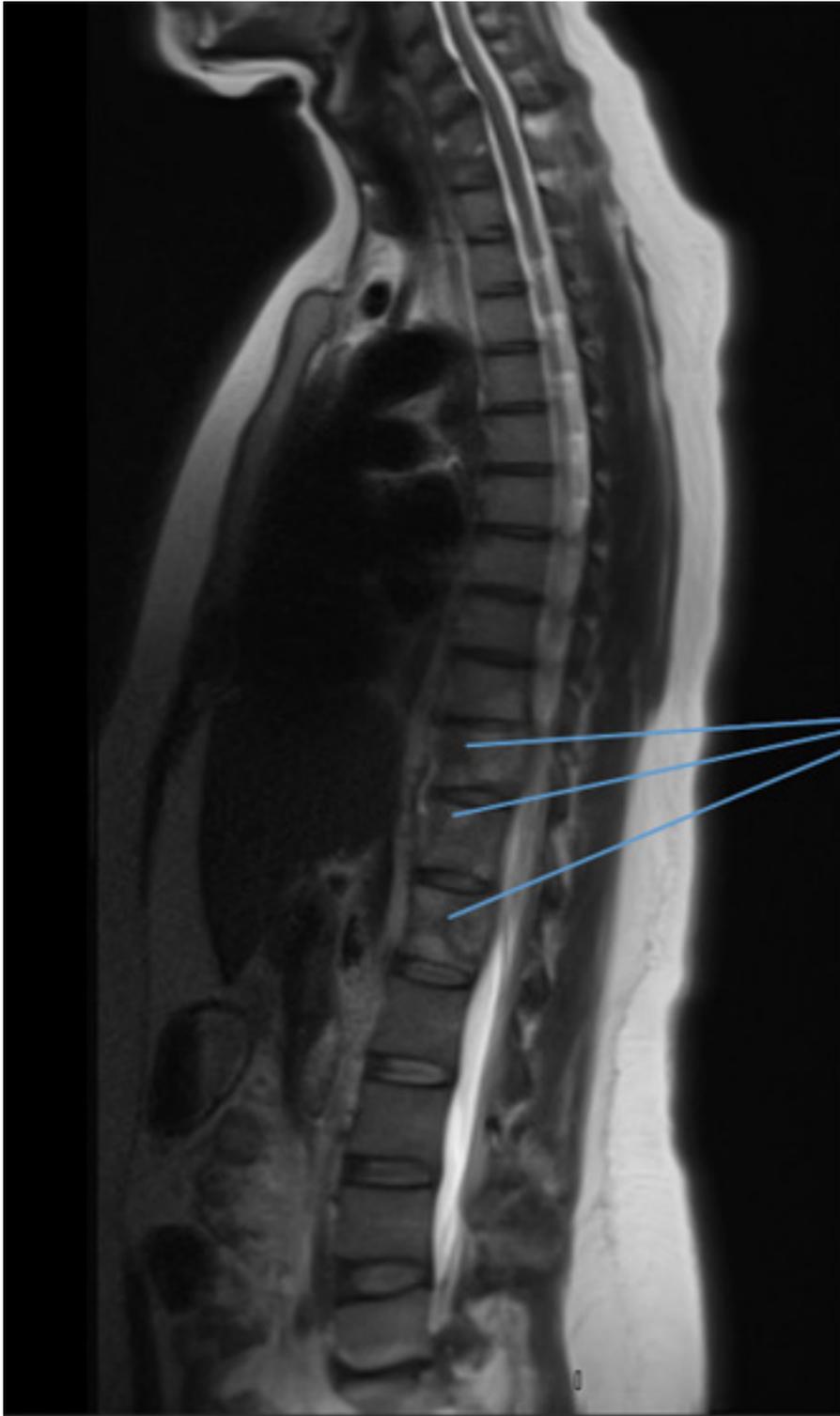
With a high degree of suspicion of disseminated tuberculosis the patient was started on treatment for disseminated tuberculosis. In October 2018 while on treatment for tuberculosis, she became pregnant and gave birth to a healthy baby in June 2019.

An MRI spine was repeated in September 2019 after nearly one year of treatment that showed significant improvement in her spinal lesions. In December 2019, her repeat chest x-ray was normal.

She received the treatment for 18 months in total.

**Figure 6: Post Treatment Chest X Ray**
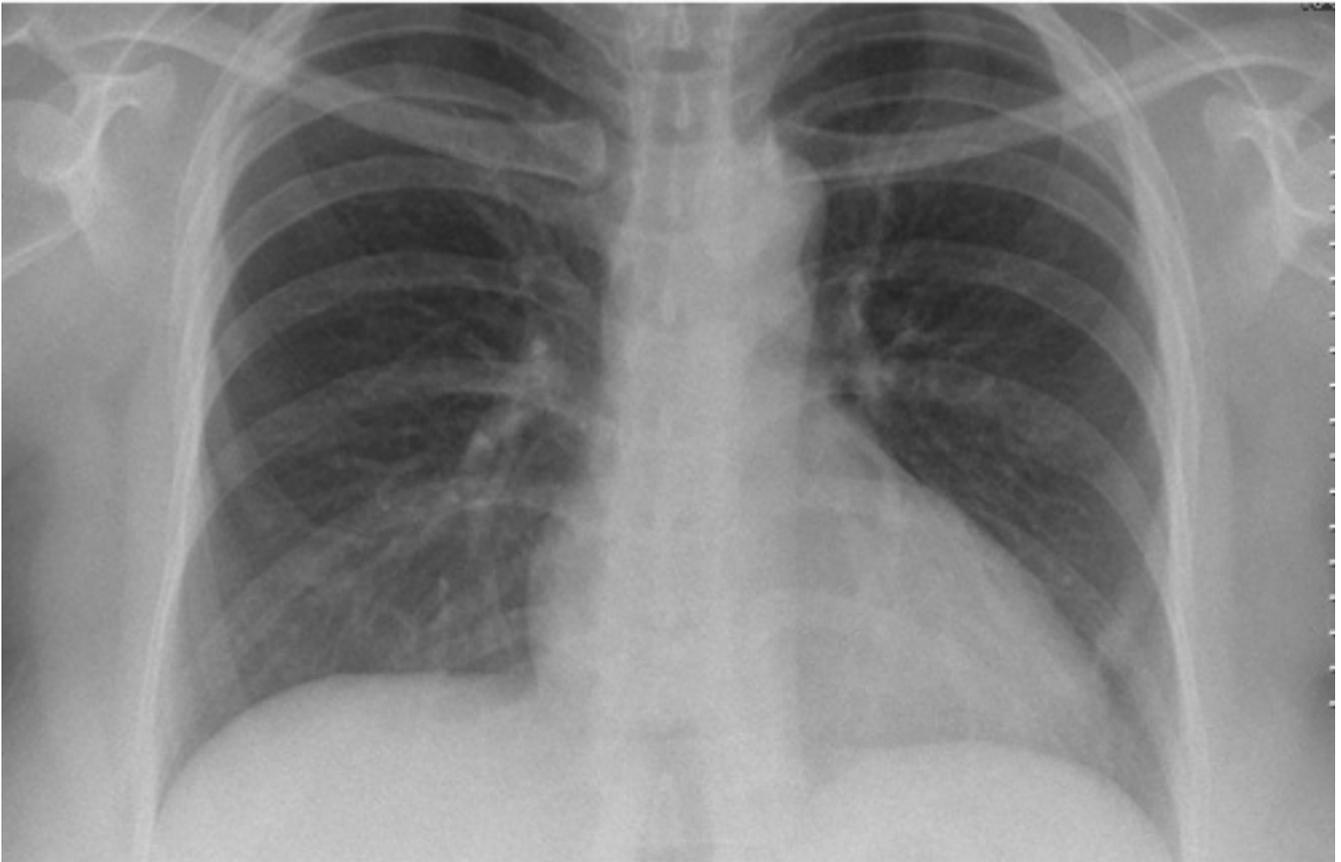
Figure 7: Post Treatment MRI Lumbar Spine
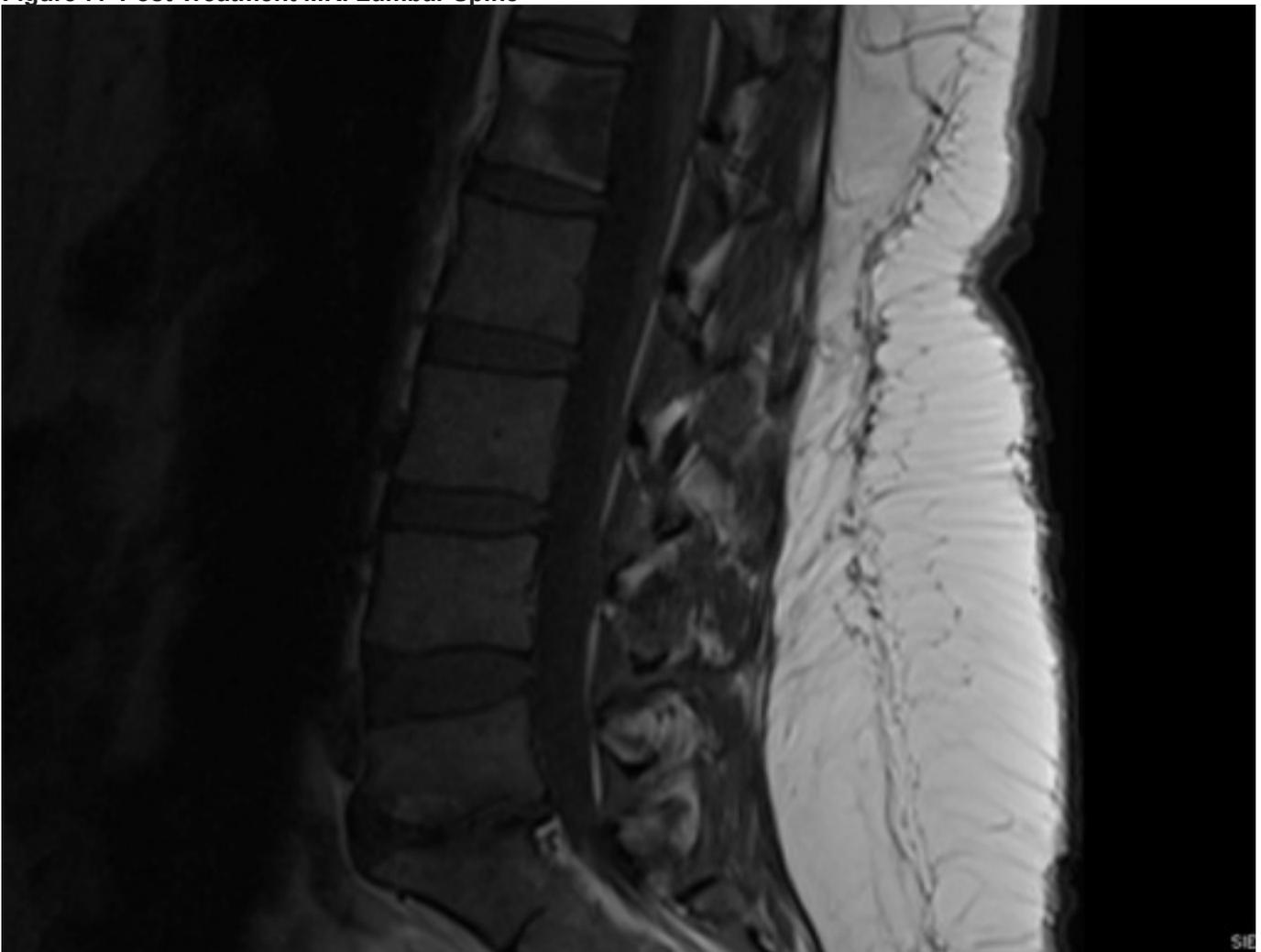
Discussion

This case report supports the fact that there is a good possibility that the patient presenting with tuberculosis might not present with its well-known symptoms of cough with sputum or sputum stained with blood, sweats at night and unintentional loss of weight. In the absence of these typical symptoms a clinician can take a long time to diagnose the disease itself; this can lead to delay in treatment, prolong time of treatment and occur more harm to patients (7).

Clinical appearance can be non-specific and distinctive expected chest radiographic findings of TB, like caseating granulomas in upper parts of lungs may not be seen until late in the course of the disease (8).

There are certain conditions in which there is more chance of contracting the disease as these conditions lowers the immune system and hence make subjects more vulnerable to develop TB. These conditions include people with alcohol or other drugs addiction, patients infected with human immune deficiency virus, patients with chronic diseases such as diabetes, patients on haemodialysis or with renal failure, post-extensive surgical procedures, organ transplantation, rheumatoid arthritis, chronic obstructive pulmonary disease, cystic fibrosis or suffering from neoplastic conditions (9).

If a patient presents with findings of pleural effusion on chest radiograph and there is clinical suspicion of tuberculosis, then pleural biopsy is the investigation of choice. Sometimes tuberculosis can present acutely as adult respiratory distress syndrome. In such cases the clinician might be misguided and one might try to treat such acute presentations with simple antibiotics, however that will not improve the patient condition and of course again can lead to further delay in prompt treatment of tuberculosis. It is imperative that clinicians should be aware of such deceptive and varied presentations not only in symptoms but on radiographs (10).

A study in a hospital in Boston, USA showed that four per cent of the patients were misdiagnosed on admission despite the fact that the majority of them had radiographic findings characteristic of tuberculous disease. This should make us think that how many can be missed if there is absence of typical radiographic findings of tuberculosis. The disease does not always present with granulomas in upper lobes of lungs (11).

The diagnosis of miliary TB can be challenging. The subtle deceitful course that the infection takes, the vague symptoms it may present with and the delays in obtaining a microbiological or histological diagnosis all contribute to the lag in its diagnosis and consequent high morbidity and mortality (12).

"A compelling radiologic finding in chest CT is the "tree-in-bud" pattern. This shows multiple branching linear structures that represent bronchogenic dissemination of disease with caseating necrosis in the respiratory and terminal bronchioles. These branching opacities have a lobar or segmental distribution and are considered reliable markers of activity" (13).

If there are not many symptoms that are suggestive of tuberculosis and sputum smears come up negative, but the clinician has suspicion due to history of travel or any other reason, the flexible fibreoptic bronchoscope is also an option. In fact carrying out bronchoscopy and taking pleural biopsies has been a particularly effective and fruitful option not only in the diagnosis of respiratory tuberculosis, but also in obtaining secretions and tissue in difficult cases (14).

Tuberculosis can invade practically any organ. It spreads via blood and lymphatic endocrine system. The proportions of organ involved in multiple publications suggest that most cases of tuberculous outside lungs are seen with pleural, skeletal spine, and lymphatic involvement, and disseminated TB can involve two or more organs. It can also involve the genito-urinary system and brain (15).

"The spine is the most common site of bone involvement by tuberculosis. Spinal tuberculosis or vertebral bone involvement (Pott's disease) accounts for approximately 50% of cases of skeletal tuberculosis. The most common location is first lumbar vertebrae. The disease process most often begins in the anterior part of the vertebral body adjacent to the end plate. Extension may occur along the anterior or posterior longitudinal ligament or directly through the end plate. Collapse of a vertebral body, particularly the anterior segment, may result in tuberculous kyphosis. Magnetic resonance imaging is of great value in diagnosis of spinal tuberculosis and abscesses" (16).

As this case is about atypical presentation of tuberculosis, it is interesting to mention here that hypercalcemia in a patient with no other cause such as hyperparathyroidism and malignancy, granulomatous disease should be kept in differential diagnosis including TB (17).

Tuberculosis, along with berylliosis, fungal granulomas, Hodgkin non-Hodgkin lymphomas are some conditions that are associated with disorders of calcium metabolism (18).

Conclusion

The above case and also evidence from literature demonstrate clearly that tuberculosis does not always present with typical symptoms and radiographic evidence. Also, the extent of disease itself might not be evident from symptoms alone. Widespread tuberculosis can present with minimum symptoms that can be deceptive and diagnosis can be missed easily.

Tuberculosis is a difficult diagnosis because although there are many diagnostic tests available none of them are quick and fully confirmatory and this can delay both

diagnosis and treatment and from untreated infectious individuals the disease continues to spread. This is the reason that we are still struggling to control and eradicate tuberculosis.

To control this infection globally more rapid diagnostic tests are required, and more effective ways of screening need to be found.

As health care professionals we should be alert and aware that with limited and minimum symptoms tuberculosis can be deceptive and its diagnosis easily missed.

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