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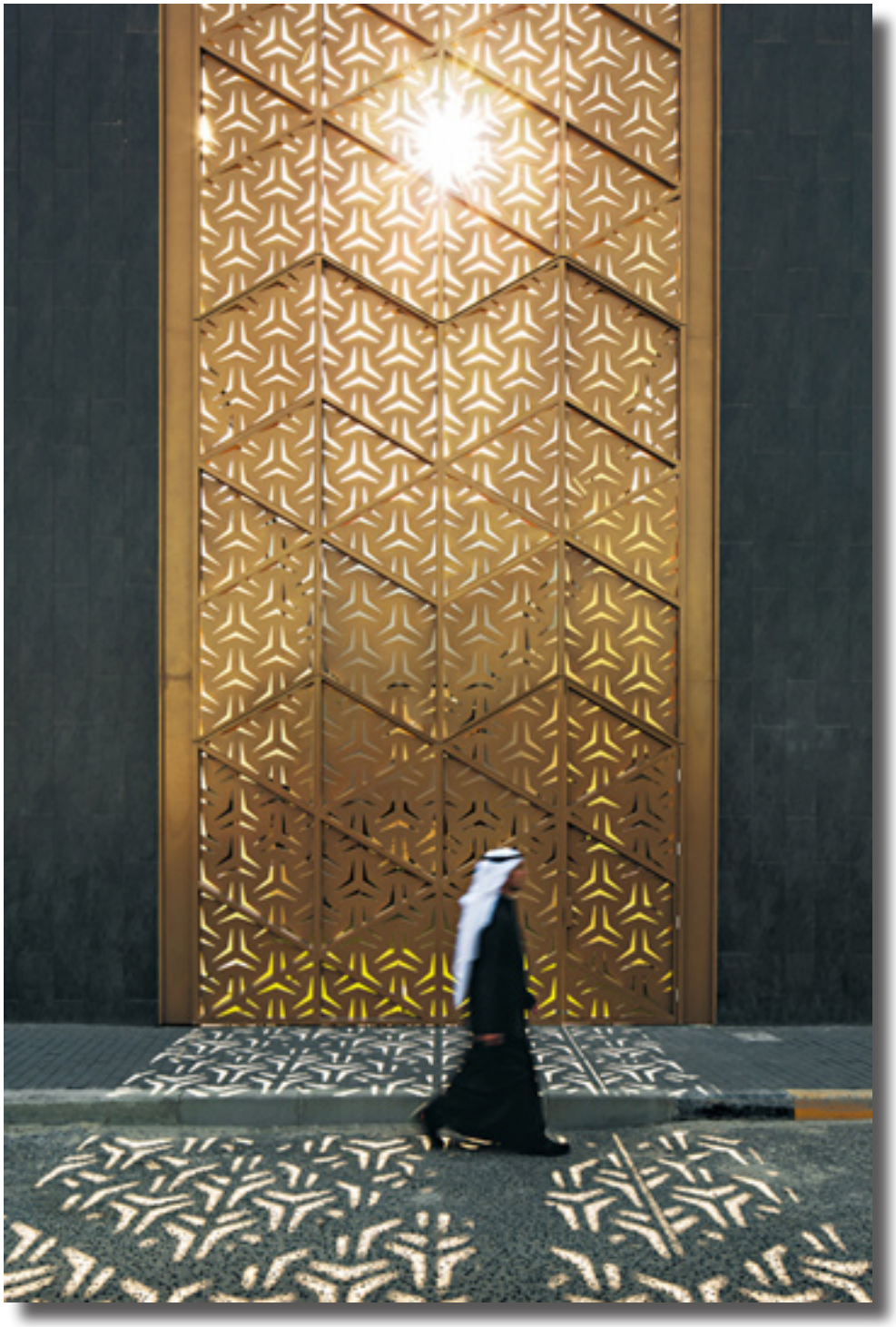

Job satisfaction in PHC Kuwait

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In this issue there are various topics dealing with job satisfaction, child abuse, diabetes and falls, effect of oxytocin on breast milk, a previously unrecognised radiological sign and irritable bowel syndrome.

Al-Ghareeb, H.Y, & Al-Wateya, R.A, looked Job satisfaction in PHC Kuwait. The authors stressed that Job satisfaction of staff is an important issue for performance of a health care system. They assessed employee satisfaction ¬_ in Kuwait regarding his or her job opinion, training and development, adequacy of resources, interaction with patient and co-worker, degree of supervision and evaluation from supervisor and manager, overall experience regarding quality and safety. They used a comparative cross sectional study in one year (Sept 2016 to Sept 2017) in 60 PHC centers in five health regions in Kuwait surveyed 7253 staff members who are working at the Primary Health Centers (by using a designed self-administered employee satisfaction questionnaire. The response rate for all staff was 55%, the highest respondent rate was for nurses (74%) and the lowest respondent rate was for administrative staff (34%) and assistant nurses (34%). The authors concluded that these results contribute to an understanding of factors that influence levels of satisfaction between primary health care staff and interventions need to be implemented in order to improve the level of job satisfaction among healthcare professionals .

A paper from Kurdistan looked at the effects of oxytocin therapy on amount of breast milk in the postpartum period in Maternity Teaching Hospital. The author followed a control-case study design. It was carried out on 40 breastfeeding mothers immediately after delivery. They were divided into two groups, a case group and a control one. The case group received oxytocin 10 IU during the third stage of labor, while the control group did not receive it. The results of the present study indicated that although the case group were given oxytocin 10 IU during the third stage of labor, they did not differ from the control group that received nothing regarding the normal amount of their breast milk 2 hours after delivery. One week after the delivery; however, the normal amount of breast milk was higher in the case group than the control group, such that 6 mothers in the case group, while 3 in the control group had a normal amount of breast milk, respectively. The authors concluded that the mothers who had received oxytocin had a significantly higher level of breast milk than the control group; therefore, mothers who are diagnosed with probable low amount of breast milk are recommended to consume it.

A paper from Australia provides the first published description of a previously unrecognised radiological sign. Failure to recognise a crescent trachea can result in erroneous under-classification of high-grade goitres. This is important to establish, as tracheal compression may not be obvious on clinical examination nor history, but can result in significant tracheal narrowing. Recognition of subclinical tracheal compression, based on a positive crescent trachea sign, is a relative indication for surgery, and can help optimise peri-operative management as well as patient safety.

A cross-sectional analytical study from Yemen looked at the prevalence and risk factors of childhood abuse among Hadhramout University Students in Yemen. The study was conducted in five colleges at Hadhramout university in the educational year 2015-2016.

Overall, 395 students, (57.5%) were males. Of the students (88.4 %) reported exposure to some form of child abuse in the form of emotional (79.2%), physical (75.7%) or sexual abuse (35.2%) of which 12.7 were reported to have been forced into sexual assault. Parents were the main perpetrators of physical and emotional abuse, while persons outside the home were the main perpetrator of sexual abuse. The results showed significant association between child abuse, sex of students and the family environment. Male students were significantly more likely to be physically, emotionally and sexually abused. Child abuse was also significantly more prevalent among students coming from homes with domestic violence and psychological problems among parents. The authors concluded that Child abuse is a common phenomenon, with long-term adverse effects among Hadhramout university students. Early diagnosis and preventive educational interventions can play a critical role in reducing the prevalence of child abuse and its harmful consequences.

Helvaci MR et al tried to understand whether or not there are some significant relationships between irritable bowel syndrome (IBS), smoking, and metabolic parameters. The study included 936 patients with the IBS and 346 control cases. Mean age of the IBS patients was 41.0 ± 14.7 (13-86) years. Interestingly, 63.2% of the IBS patients were female. Prevalence of smoking (35.2% versus 20.8%, $p<0.001$), chronic gastritis (CG) (80.4% versus 15.0, $p<0.001$), antidepressants use (46.4% versus 16.1%, $p<0.001$), hemorrhoids (37.1% versus 7.2%, $p<0.001$), and urolithiasis (22.0% versus 9.5%, $p<0.001$) and mean values of fasting plasma glucose (FPG) (111.9 versus 105.4 mg/dL, $p= 0.002$) and triglycerides (167.0 versus 147.3 mg/dL, $p= 0.013$) were all higher in patients with the IBS, significantly. The authors concluded that IBS may be a low-grade inflammatory process being initiated with infection, inflammation, anxiety, depression, sleep disorders, cancer fear, death fear, and smoking-like stresses, and eventually terminates with dysfunctions of the gastrointestinal and genitourinary tracts. There may be some significant associations between female sex, IBS, CG, depression, hemorrhoids, urolithiasis, smoking, higher FPG, and hypertriglyceridemia. FPG and triglyceride values may be sensitive acute phase reactants indicating some inflammatory processes like smoking and IBS in the body.

A second paper from Kurdistan in collaboration with the United Kingdom looked at Falls in Older People with Diabetes Mellitus. The authors followed a cross-sectional study that analyzed factors associated with higher incidence of falls among 150 older people with diabetes mellitus in Kurdistan. The results showed that incidence of falls were positively associated with increased age, longer duration of diabetes, treatment with insulin therapy and sulfonylureas, poor diabetes control, polypharmacy, decreased mobility, peripheral neuropathy, osteoarthritis, retinopathy, living alone, living in a care home, smoking and excess alcohol consumption.

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Job satisfaction in PHC Kuwait

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Abstract

Background: Job satisfaction of staff is an important issue for performance of a health care system. The aim of our study was to assess employee satisfaction in Kuwait regarding their opinion of their job, training and development, adequacy of resources, interaction with patients and co-workers, degree of supervision and evaluation from supervisor and manager, overall experience regarding quality and safety, to determine the views and preferences of the health care personnel regarding the current health system, and the recent introduction of accreditation programme to gain a better understanding of the impact of accreditation on quality of care as perceived by PHC staff members and directors (the key enablers and challenges to the implementation of accreditation) to identify possible strategies to improve implementation of accreditation in PHC in Kuwait and to identify the barriers and problems the employee faces in the primary health care centers in Kuwait and make appropriate recommendations in the light of the results of this study to help the decision-makers in solving the problems which can contribute to the development of policies regarding the health system and improve the quality and safety in PHC centers.

Methods: This comparative cross sectional study was conducted in Kuwait in one year (September 2016 to September 2017) in 60 PHC centers in five health regions in Kuwait and surveyed 7,253 staff members who are working at the Primary Health Centers (physicians, nurses, pharmacists and assistant pharmacists, lab technician, x-ray technician, administrative) by using a designed self-administered employee satisfaction questionnaire.

Results: The response rate for all staff was 55%; the highest respondent rate was for nurses (74%) and the lowest respondent rate was for administrative staff (34%) and assistant nurses (34%).

Conclusions: The presented results contribute to an understanding of factors that influence levels of satisfaction between primary health care staff and interventions need to be implemented in order to improve the level of job satisfaction among healthcare professionals.

Implementing accreditation is an important first step towards improving the quality and safety in PHC centers.

Key words: Job satisfaction, staff, accreditation, primary healthcare centres, Kuwait

Introduction

Kuwait is one of the leading countries that has adopted and implemented the PHC approach in the Middle East.

Primary health care services cover a wide range of health care that is provided for patients who are not admitted to the hospital. The growth of these services has been driven by patient desire to receive a service that is accessible at an appropriate cost, with a focus on health promotion and disease prevention (1). Primary health care centers serve the health care needs of their community and thus are integral to the well-being of these communities (1).

One increasingly employed method for promoting quality at the healthcare organizational level is accreditation (2, 3,4).

Accreditation of PHC practices was reported to increase emphasis on the role of PHC within the healthcare system and to ensure quality control and improvement (2, 5).

In 2012, the Kuwait Ministry of Health (MOH) launched the Primary Healthcare (PHC) Canadian accreditation program to improve quality across the continuum of care.

Accreditation contributes to increased job satisfaction among physicians, nurses, and other providers (6).

Accreditation is a process whereby an organization is assessed on a set of pre-determined standards. It intends to promote quality improvement through diverse approaches; they are either mandated by the government, voluntary or initiated by independent agencies (7).

Employees are considered as the wealth of each organization. Effectiveness and performance of organizations depend upon effectiveness and performance of the human workforce of that organization (8).

So the term “satisfaction” is a complex notion because it involves not only the personal experience and expectations, individual and social values but is also related behaviours, such as motivation, faithfulness, professional fulfillment, etc. and contains different meanings for each individual. In spite of this multi-lateral and complex structure, it is vital to ensure the satisfaction of the employees in the sectors like health care sector where intense, often long term, and emotionally charged labor and human relations take place, and thus measurement of this elusive and variable quality is necessary (9).

Job satisfaction is the contentment that employees get from the work they do and from the physical environment and the “atmosphere” existing in the environment. Because job satisfaction is an emotional notion, its perception differs from person to person (10).

Healthcare worker job satisfaction is a very important parameter that influences productivity as well as quality of work. This complex phenomenon is an attitude towards one’s job that has an impact not only on motivation, but also on career, health and relations with co-workers. Healthcare worker job satisfaction has a great impact on quality, effectiveness, and commitment to work and at the same time on healthcare costs (11).

Due to the importance of human resources in providing quality PHC services, it is integral for PHC leaders to assess their Quality of work life (QWL) and to understand their organizational and career intentions. Such procedures may assure the continuity and improvement of the health services being provided (12).

The study of primary care clinics is important because clinics are often the entry point for patients into a given medical system (13).

Method

Study design, setting, and duration:
This descriptive cross-sectional study was conducted over a period of one year (September 2016 to September 2017) in 60 PHC centers in five health regions in Kuwait, for all staff employees who are working at the Primary Health Centers (physicians, nurses, pharmacists and assistant pharmacists, lab technician, x-ray technician, administrative) by using a designed self-administered employee satisfaction questionnaire whereas semi-structured interviews were conducted with directors. The researcher was personally responsible for the distribution and collection of all questionnaires.

The number of staff members for each clinic was taken from the health statistics section in primary care central department of the Ministry of Health (MOH).

Sample:
Questionnaires were distributed to 60 PHC centers in the five Governmental Health regions to all full time PHC centers employees (physicians, nurses, technical and administrative staff). The respondents are those who completed more than 50% of the items of the questionnaire and the selected 60 PHC centers were representative of 106 PHC centers in Kuwait.

Inclusion and exclusion criteria:
The inclusion criteria were all employees at the PHCs who were available at the time of the study and willing to participate. The exclusion criteria were those who were not available, such as those who were on leave and those who decided to exercise their right not to participate.

Data collection Tool:
Components and details of the instrument:
Following permission from the MOH in Kuwait to conduct the study with ethical approval the survey was sent to the PHC centers through the principal investigator.

Data collection was conducted using a self–administered structured Questionnaire adapted from a tool used by Canadian accreditation with minor changes to the wording.

It consisted of 7 clauses (forms); it was designed according to a Likert scale, with the answers (strongly disagree, disagree, don't know, agree, strongly agree) given the weights (1, 2, 3, 4, 5). The higher the mean, indicated a higher degree of consent on the clause. It examined the level of satisfaction with different job characteristics.

The Form (1) questionnaire was distributed to the physicians and included seven scales composed of several domains. These were: statement of their job (ten domains), training and development (two items), co-worker (four items), opinion about immediate supervisor/manager (seven items), safety and health (seventeen items), overall experience (thirteen items) and overall grade on patient safety and quality (two items).

The Form (2) questionnaire distributed to the Nurses included eight scales composed of eight domains. These were: statement of their job (eleven items), training and development (two items), co-worker (four items), opinion about supervisor/manager (seven items), safety and health (nineteen items), overall experience (thirteen items) and overall grade on patient safety and quality (two items).

The Form (3) questionnaire distributed to the pharmacists included seven scales composed of seven domains. These were: statement of their job (eleven items), training and development (two items), co-worker (four items), opinion about supervisor /manager (seven items), safety and response to mistakes (ten items), overall experience (eleven items) and overall grade on patient safety and quality (two items).

The remaining four questionnaire surveys were translated to Arabic since that was the language respondents were most comfortable with for workers who speak Arabic only.

The Form (4) questionnaire distributed to the administrative employees included seven scales composed of seven domains. These were: statement of their job (eight items), training and development (two items), co-worker (three items), opinion about supervisor /manager (seven items), safety (four items), overall experience (four items) and overall grade on patient safety and quality (two items).

The form (5) questionnaire distributed to the lab employees included seven scales (composed of seven domains), these were: statement of their job (eight items), training and development (two items), co-worker (three items), opinion about immediate supervisor (three items), manager (four items), safety (four items), overall experience (four items) and overall grade on patient safety and quality (two items).

The form (6) questionnaire distributed to the assistant nurses employees included seven scales (composed of seven domains); these were: statement of their job (eight items), training and development (two items), co-worker (three items), opinion about supervisor /manager (seven items) safety (four items), overall experience (four items) and overall grade on patient safety and quality (two items).

The form (7) questionnaire distributed to the X-ray technicians included seven scales (composed of seven domains), these were: statement of their job (eight items), training and development (two items), co-worker (three items), opinion about immediate supervisor/manager (seven items), safety (four items), overall experience (four items) and overall grade on patient safety and quality (two items).

Staff were assured that their participation was voluntary, their choice to participate would not affect their employment and that directors would not view their responses. Participants were requested to complete the survey during their free time and in a setting of their choice and to return it to the head of clinic in a sealed envelope within two weeks of receiving it.

Each participant was given a code number instead of their names and the privacy of their information given was secured.

Ethical Consideration:
Ethical clearance and approval to conduct this research was obtained from the MOH Research Ethics Committee and the approval for the survey was sent to the PHC centers through the principal investigator.

Data analysis:
Data were analyzed using SPSS version 20. Frequencies were taken for all the variables. (Strongly agree/Agree) were considered a positive response and (strongly Disagree/Disagree/Neutral) were considered a negative response.

Results

Only 3,969 of the 7,253 staff answered the questionnaire and returned it completed after distribution to 60 PHC centers in five health regions in Kuwait.

The highest percentage of staff response rate per health region was from Hawali (60%) and the lowest from Jahra (44%) as shown in Table 1.

A total of 74% of respondents were nurses,70% were X-ray technicians, 69% were lab and assistant technicians, 65% were pharmacists and assistant pharmacists, 59% were physicians and 34% were assistant nurses and administrative staff as shown in Table 2.

Overall grades of safety and Quality for all staff were all above 50% as shown in Table 3.

Descriptive statistics

Table 1: Staff response rate per health region

Health area	No. of participating centers per Health region	No. of recruited staff members per region	No. of respondent staff per health region	Percent response rate per health region
Farwaniya	12	1369	762	56%
Ahmadi	12	1339	791	59%
Jahraa	12	2092	912	44%
Hawali	12	1310	786	60%
Asma	12	1244	657	53%

Table 2: Staff position respondent rate

Work type	Number of respondents	Total Number	Percent response rate
Physician	719	1235	58%
Nurse	1296	1742	74%
Pharmacist & assistant pharmacists	429	659	65%
Administrative	902	2649	34%
Lab & assistant technicians	496	723	69%
Assistant nurses	43	128	34%
X-ray technicians	82	117	70%
Total	3967	7253	55%

Table 3: Outcome measures on patient quality and safety

Outcome measures	Outcome measures on patient Quality		Outcome measures on Patient Safety	
	Positive responses	Total responses	Positive responses	Total responses
Physician	679(95%)	713	675(95%)	711
Nurses	1233(99%)	1249	1242(100%)	1248
Pharmacists and assistant pharmacists	402(95%)	425	400(95%)	421
Administrative	548(66%)	884	628(71%)	883
Lab & assistant technicians	270(55%)	489	287(57%)	487
Assistant nurses	32(74%)	43	32(74%)	43
X-ray technician	76(93%)	82	75(93%)	81

Separating the studied domains in physician job satisfaction questionnaire the main score of job satisfaction by order of preference obtained was as following: Safety and health 59.9±16.03; Your overall experience 41.5±12.1; Job nature (your job) 36.2±9.9; Your supervisor/manager 28.9 ± 6.2; Your Co-worker 16.5 ± 3.4; Training and development 7.3 ± 1.9; Your overall opinion: (Quality grade2.2 ± 0.83, Safety grade 2.1 ± 0.81). The highest and lowest domains were safety and health and Training and development respectively as shown in Table 4.

Table 4: Mean of satisfaction in different domains for Physician (total 719)

Domain	Mean	SD
Job nature (your job)	36.2	9.9
Training and development	7.3	1.9
Your Co-worker	16.5	3.4
Your supervisor/manager	28.9	6.2
Safety and health	59.9	16.0
Your overall experience	41.5	12.1
Your overall opinion:		
- Quality grade	2.2	0.83
- Safety grade	2.1	0.81

Separating the studied domains in Nurse job satisfaction questionnaire the main score of job satisfaction by order of preference obtained was as following: Safety and health 70.3±15.4; Job nature (your job) 43.0± 9.04; Your overall experience 41.1±10.9; Your Co-worker 17.0± 2.6; Your supervisor 12.6 ±2.1; Training and development 8.06 ± 1.6; Your overall opinion: (Quality grade 1.5 ±0.61, Safety grade 1.5 ± 0.67). The highest and lowest domains were Safety and health and Training and development respectively, as shown in Table 5.

Table 5: Mean of satisfaction in different domains for Nurse (total 1296)

Domain	Mean	SD
Job nature (your job)	43	9.04
Training and development	8	1.6
Your Co-worker	17.0	2.6
Your supervisor	12.6	2.1
Your manager (head of the clinic)	16.4	2.5
Safety and health	70.3	15.4
Your overall experience	41.4	10.9
Your overall opinion:		
- Quality grade	1.5	0.61
- Safety grade	1.5	0.67

Separating the studied domains in pharmacists and assistant pharmacists job satisfaction questionnaire, the main score of job satisfaction by order of preference obtained was as following: Job nature (your job) 41.2± 10.5; safety and health 38.2 ±7.9; Your overall experience 35.6 ±10.4; Your Co-worker 17.2± 2.9; Your manager (head of the clinic) 16.1±3.3; Your supervisor 12.8 ±0.11; Training and development 7.2 ± 1.9; Your overall opinion: (Quality grade 2.2 ±0.82, Safety grade 2.1±0.84 . The highest and lowest domains were Job nature (your job) and Training and development respectively, as shown in Table 6.

Table 6: Mean of satisfaction in different domains for pharmacist and assistant pharmacists (total 429)

Domain	Mean	SD
Job nature (your job)	41.2	10.5
Training and development	7.2	1.9
Your Co-worker	17.2	2.9
Your supervisor	12.8	0.11
Your manager (head of the clinic)	16.1	3.3
Safety and health	38.2	7.9
Your overall experience	35.6	10.4
Your overall opinion:		
- Quality grade	2.2	0.82
- Safety grade	2.1	0.84

Separating the studied domains in administrative job satisfaction questionnaire, the main score of job satisfaction by order of preference obtained was as following: Job nature (your job) 30.5 ±8.4;, Your overall experience 18.2±5.5; Your manager (head of the clinic) 15.9±3.9; Safety and health 15.1± 4.3; Your supervisor 11.9±3.1; Your Co-worker 11.7±3.1; Training and development 7.3 ±2.3; Your overall opinion: (Quality grade 3.6±1.08, Safety grade 3.7±1.1). The highest and lowest domains were Job nature (your job) and Training and development respectively as shown in Table 7.

Table 7: Mean of satisfaction in different domains for administrative staff (total 902)

Domain	Mean	SD
Job nature (your job)	30.5	8.4
Training and development	7.3	2.3
Your Co-worker	11.7	3.1
Your supervisor	11.9	3.1
Your manager (head of the clinic)	15.9	3.9
Safety and health	15.1	4.3
Your overall experience	18.2	5.5
Your overall opinion:		
- Quality grade	3.6	1.08
- Safety grade	3.7	1.10

Separating the studied domains in Lab job satisfaction questionnaire, the main score of job satisfaction by order of preference obtained was as following: Job nature (your job) 30.8 ±8.1; Your overall experience 17.3±5.4; Your manager (head of the clinic) 14.4±4.3; Safety and health 13.9± 4.5; Your supervisor 12.5±2.8; Your Co-worker 11.7±2.8; Training and development 7.4±2.2; Your overall opinion: (Quality grade 3.4±1.06, Safety grade 3.4±1.06). The highest and lowest domains were Job nature (your job) and Training and development respectively as shown in Table 8.

Table 8 : Mean of satisfaction in different domains for Lab Technician and Assistant Lab Technician (total 496)

Domain	Mean	SD
Job nature (your job)	30.8	8.1
Training and development	7.4	2.2
Your Co-worker	11.7	2.8
Your supervisor	12.5	2.8
Your manager (head of the clinic)	14.4	4.3
Safety and health	13.9	4.5
Your overall experience	17.3	5.4
Your overall opinion:		
- Quality grade	3.4	1.06
- Safety grade	3.4	1.06

Separating the studied domains in Assistant nurse job satisfaction questionnaire, the main score of job satisfaction by order of preference obtained was as following: Job nature (your job) 31.3 ±7.5; Your overall experience 19.2 ±4.8; Your manager (head of the clinic) 16.2±3.7; Safety and health 16.1± 3.08; Your supervisor 12.0±2.6; Your Co-worker 11.9±0.49; Training and development 7.6±1.6; Your overall opinion: (Quality grade 3.9±0.79, Safety grade 3.8±0.90). The highest and lowest domains were Job nature (your job) and Training and development respectively as shown in Table 9.

Table 9: Mean of satisfaction in different domains for Assistant nurse (total 43)

Domain	Mean	SD
Job nature (your job)	31.3	7.5
Training and development	7.6	1.6
Your Co-worker	11.9	0.49
Your supervisor	12.0	2.6
Your manager (head of the clinic)	16.2	3.7
Safety and health	16.1	3.08
Your overall experience	19.2	4.8
Your overall opinion:		
- Quality grade	3.9	0.79
- Safety grade	3.8	0.90

Separating the studied domains in X-ray technician job satisfaction questionnaire, the main score of job satisfaction by order of preference obtained was as following: Job nature (your job) 34.6 ±6.1; Your overall experience 20.0 ±4.1; Your manager (head of the clinic) 17.2±2.45; Safety and health 16.9±2.9; Your Co-worker 13.2±2.09; Your supervisor 12.4±2.4; Training and development 8.5±1.6; Your overall opinion: (Quality grade 4.2±0.68, Safety grade 4.3± 0.7). The highest and lowest domains were Job nature (your job) and Training and development respectively as shown in Table 10.

Table 10: Mean of satisfaction in different domains for X-ray technician (total 82)

Domain	Mean	SD
Job nature (your job)	34.6	6.1
Training and development	8.5	1.6
Your Co-worker	13.2	2.09
Your supervisor	12.4	2.4
Your manager (head of the clinic)	17.2	2.6
Safety and health	16.9	2.9
Your overall experience	20.0	4.1
Your overall opinion: - Quality grade - Safety grade	 4.2 4.3	 0.68 0.73

Discussion

The results of the present study demonstrated that job satisfaction differs among different staff because of different dimensions which indicates that several dimensions are potential areas for improvement but with prioritization.

This study demonstrated the positive impact of accreditation on PHC centers in several areas of quality and performance.

Regarding the Job nature, all the staff were satisfied with 'understanding their job description', ' their decision to what to do in their work', 'their ability to make improvement in their work', 'the use of their skills to improve their job', 'receiving good recognition about their work ',' having enough time to do what is expected of them in their job ' except administrative 40% (4.08±.86), 'taking their opinion regarding changes affecting their job' except physicians 49% (3.2±1.06), 'the availability of materials ,supplies and equipment in their work' except physicians 43% (3.04±1.1) and pharmacists 39% (2.9±1.1), only nurses and pharmacists were satisfied with 'having enough staff to handle the workload' in comparison to physicians who were not satisfied 42%(2.9±1.2).

The reason behind dissatisfaction is the shortage of physician staff which affects the nature of a PHC doctor's work and the expectation from the supervisors would be higher in checking and providing the materials, supplies and equipment.

Regarding Staff Training and development, all the staff were satisfied in 'receiving good training in their job' (highest for nurses and X-ray technicians and lowest for pharmacists and administrative staff)' all the staff were satisfied in 'having good opportunities to improve their care' (highest for X-ray technicians and nurses and lowest for physicians and pharmacists).

The majority of Staff were more satisfied with the training and development domain.

Regarding co-worker opinion, all the staff were satisfied in 'people treating each other with respect', 'supporting one another in the department', 'a feeling of belonging to this co-worker', in addition physicians, nurses and pharmacists were satisfied 'when they work together as a team to get the work done when a lot of work needs to be done quickly'.

The majority of staff were satisfied with 'working with co-workers' domain.

Regarding supervisor/manager opinion, all the staff were satisfied with 'fair treatment from their supervisor / manager' (highest for pharmacists and nurses and lowest for assistant nurses and lab technicians), 'providing the staff with feedback about job performance' (highest for nurses and lowest for administrative staff and assistant nurses),' asking supervisor/manager if they face any difficulties' (highest for nurses and lowest for administrative staff), in effective application of supervisor /manager on the organization's goals' (highest X-ray technicians and nurses and lowest for lab and administrative staff), 'commitment of providing high quality care' (highest for X-ray technicians and nurses and lowest for lab and administrative staff), 'regarding action of supervisor/ manager on staff feedback' (highest X-ray technicians and nurses and lowest administrative staff), 'in commission of supervisor /manager to provide a safe and healthy workplace' (highest in X-rays technicians and nurses and assistant nurses and lowest in administrative staff).

The majority of staff were satisfied with their opinion for their supervisor/manager domain.

Regarding Safety and health, it differed according to each staff position as pharmacists had their own questions:

All the staff were satisfied 'in taking effective action in the organization to prevent violence in the workplace' (highest

Table 11: Comparing mean score of satisfaction for all staff

Matters of satisfaction	Average score of satisfaction						
	Physician	Nurses	Pharmacists	Administrative	Lab technician	Assistant nurse	X-ray technician
Job nature	36.1±10.8	43.0±9.04	41.2±10.5	30.5±8.4	30.8±8.1	31.3±7.5	34.6±6.1
Training and development	7.3±1.9	8.06±1.6	7.2±1.9	7.3±2.3	7.4±2.2	7.6±1.6	8.5±1.6
Your Co-worker	16.5±3.4	17.08±2.6	17.2±2.9	11.7±3.1	11.7±2.8	11.9±4.9	13.2±2.09
Your supervisor	28.9±6.2	12.6±2.1	12.8±0.11	11.9±3.1	12.5±2.8	12.0±2.6	12.4±2.4
Your head of the clinic	28.9±6.2	16.4±2.5	16.1±3.3	15.9±3.9	14.4±4.3	16.2±3.7	17.2±2.6
Safety and health 16.9±2.9	59.7±15.04	70.3±15.4	38.2±7.9	15.1±4.3	13.9±4.5	16.1±3.7	
Your overall experience	41.4±12.1	41.4±10.9	35.6±10.4	18.2±5.5	17.3±5.4	19.2±4.8	20.0±4.1
Your overall opinion:							
- Quality grade	2.2±0.81	1.5±0.61	2.2±0.82	3.6±1.08	3.4±1.06	3.9±0.79	4.2±0.68
- Safety grade	2.1±0.81	1.5±0.67	2.1±0.84	3.7±1.10	3.4±1.08	3.8±0.90	4.3±0.73

X-ray technicians and nurses and lowest lab technician), in 'taking effective action in the organization to prevent abuse in the workplace' except Lab technicians 48% (3.2±1.1), in 'making balance between staff family and personal life with their work performance' (highest in X-ray technicians and assistant nurses and lowest in Lab technicians and physicians). Administrative, lab technicians, assistant nurses and X-ray technicians were satisfied in 'work in a safe clinic' (highest in X-ray technicians and lower in lab technicians).

Regarding the other statements of safety and health applied for physician and nurses, both groups were satisfied with 'doing things to improve patient safety', 'mistakes have led to positive changes in their clinic', 'evaluate their effectiveness after the staff make changes to improve patient safety', 'Patient safety is never sacrificed to get more work done', 'Staff worry that mistakes they make are kept in their personnel file', 'procedures and systems are good at preventing errors from happening', 'staff are given feedback about changes put into place based on event reports', 'Staff will freely speak up if they see something that may negatively affect patient care', 'staff are informed about errors that happen in their departments', 'Staff feel free to question the decisions or actions of those with more authority', 'staff discuss ways to prevent errors from happening again in their clinic'.

Physicians were unsatisfied regarding their 'feeling about that mistakes were held against them' 42% (3.2±.96), Physicians and nurses were unsatisfied in 'presence of patient safety problems in their clinics' physician 32% (2.7±1.1), nurses 40% (2.9±1.1), Physicians and nurses were unsatisfied in 'Staff fear to ask questions when something does not seem right' physicians 22% (2.5±1.06) and nurses 42% (3.0±1.6), nurses are unsatisfied in 'letting the same mistakes happen again and again in the nursing general department' 15% (2.1±1.03).

Regarding safety and response to mistakes in pharmacy, pharmacists and assistant pharmacists were unsatisfied in 'this pharmacy places more emphasis on prescription than on patient safety '35% (2.7±1.2), 'staff feeling that their mistakes are held against them' 39% (2.8±1.1).

There are several safety culture dimensions which are potential areas for improvement but with prioritisation; letting the same mistakes happen again and again in the nursing general department (15%). Physicians and nurses were unsatisfied with regarding Staff fear to ask questions when something does not seem right (22%). Physicians and nurses were unsatisfied with regarding presence of patient safety problems in their clinics, physicians (32%) and nurses (40%). Pharmacists and assistant pharmacists were unsatisfied regarding that 'this pharmacy places more emphasis on prescription than on patient safety' (35%). Pharmacists and assistant pharmacists feel that their mistakes are held against them (39%). Physicians were unsatisfied regarding their feeling about that mistakes were held against them in the physician department (42%). The staff are not enthusiastic to report adverse events due to fear of punishment, absence of error acknowledgement and obstruction of learning from errors.

Regarding staff overall experience, all the staff were satisfied in 'their work departments provide top quality patient care and other services '(highest for X-ray technicians, and nurses and lowest for Lab technicians), 'clinic management provides a work climate that promotes patient safety' (highest for X-ray technicians, nurses and lowest for Lab technicians); 'There is good cooperation among clinic departments that need to work together' (highest for X-ray technicians, nurses and lowest for Lab technicians), 'recommending this organisation to staff friends and family who require care' (highest X-ray technicians lowest for Lab technicians and not applied to pharmacists); 'Clinic departments work well together to provide the best care for patients' (highest for nurses and lowest for pharmacists and not applied for administrative staff, X-ray technicians, lab technicians and assistant nurses).

Physicians, nurses and pharmacists were dissatisfied in 'Clinic departments do not coordinate well with each other' physicians 19% (2.4±1.03) nurses 19% (2.3±.95) pharmacists 27% (2.7±1.01). Physicians, nurses and pharmacists are dissatisfied in 'Things "fall between the cracks" when transferring patients from one department to another', physicians 26% (2.8±1.00), nurses 16% (2.4±0.90) and pharmacists 36% (3.04±.99). Physicians, nurses and pharmacists were dissatisfied with 'Important patient care information is often lost during shift changes' physicians 25% (2.5±1.07) nurses 15% (2.2±1.02) and pharmacists 25% (2.6±1.02). Physicians, nurses and pharmacists were dissatisfied with 'It is often unpleasant to work with staff from other clinic departments' physicians 19% (2.5±.98) nurses 16% (2.3±0.92) and pharmacists 20% (2.5±0.98). Physicians, nurses and pharmacists were dissatisfied with 'Problems often occur in the exchange of information across clinic departments', physicians 25% (2.7±0.98) nurses 24% (2.5±0.96) and pharmacists 33% (2.9±0.98). The pharmacists were dissatisfied with 'actions of clinic management show that patient safety is a top priority' 37% (2.8±1.10),

Only physicians and nurses were dissatisfied with 'the clinic management seems interested in patient safety only after an adverse event happens', physicians 24% (2.6±1.03), nurses 28% (2.6±1.10).

Only physicians and nurses were dissatisfied with 'shift changes were problematic for employees in this clinic', physicians 21% (2.5±1.03), nurses 12% (2.1±0.95).

Staff overall experience is another lowest dimension regarding cooperation between departments either due to loss of patient information during shift changes or transferring patients from one departments to another or development of problems during exchange of information across clinic departments. This means that staff needs to cooperate and be familiar with the staff in different

departments and different shifts; introducing team building activities resulted in stronger interpersonal relationships and improved staff communication.

The reason behind dissatisfaction regarding shift changes for physicians and nurses is the workload that causes lack of balance between job and private life.

Regarding overall opinion in applying quality and safety standards in clinic, all the staff were satisfied with 'regarding applying quality standards' (highest for nurses and lowest for Lab technicians); all the staff were satisfied with 'regarding applying safety standards' (highest for nurses and lowest for Lab technicians).

Conclusion

The findings of this study showed that Job satisfaction is poor in some dimensions which needs improvement in the future, and good in others which needs continuation and enhancements.

The strong main point of this study was reviewing job satisfaction of all staff positions in primary health centers, but one limitation of the present study was lack of willingness among some health care staff to participate in this study and the lack of reviewing job satisfaction with working experience and salary income.

Our suggestion for promoting staff job satisfaction is that in job designing, the tasks should be challenging enough so that the individual feels satisfied. The managers in the Primary Health Care centers must give more attention to the applied all Accreditation standards in order to increase the quality of the primary services with appropriate training of the employees in order to increase their knowledge for them to be applied in suitable ways and procedures.

In conclusion improvement of remuneration, working conditions of health care staff working in PHC centers and encouragement of staff involvement when implementing new initiatives in health organizations would be expected to increase job satisfaction and contribute to the overall quality of health services.

Our research recommendations for further studies are implementation of this study on a wider level, reviewing the correlation between job characteristics with job commitment and reviewing job characteristics with job stress and integrate the patient safety initiatives in organizational policies.

Recommendation:
Based on the findings of this study, there are recommendations to follow in future:

1. Policy makers
Although the results of a single survey cannot be considered as a solid foundation for making decisions in health planning, it is imperative to reinforce relevant human resources policies, and improve working conditions and compensation.

The managers in the Primary Health Care centers must give more attention to the applied Accreditation standards with appropriate training of the employees on those standards in order to increase the quality of the primary services.

2. Healthcare workers
Priority should be given to improve relationships between management and staff and increase decision-making attitude among staff members.

Involving staff in a cooperative, team approach will allow for consideration of ways to improve aspects relating to job satisfaction.

3. Impact on services
Continuous service evaluations and monitoring of job satisfaction can be useful to determine aspects of the services that need improvement; the strategies should be aimed at improving career development ,reducing job monotony and pressure and tension at work. Perhaps designing job positions that affect years of experience, begin to combine assistance tasks with other tasks (research, teaching, management, planning and community interventions).

4. Other future researchers
Our research recommendations for further studies are implementation of this study on a wider level. Further analysis of data is needed, as there are a numbers of issues that can be explored further and consideration of socio-demographic characteristics of the participants.

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Falls in Older People with Diabetes Mellitus: a study from Kurdistan of Iraq

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Abstract

Falls are a major cause of disability and a preventable cause of death in older people. Diabetes mellitus prevalence increases with age. The prevalence of falls is higher in diabetic elderly patients. This cross-sectional study analyzed factors associated with higher incidence of falls among 150 older people with diabetes mellitus in Kurdistan.

Results demonstrated that incidence of falls were positively associated with increased age, longer duration of diabetes, treatment with insulin therapy and sulfonylureas, poor diabetic control, polypharmacy, decreased mobility, peripheral neuropathy, osteoarthritis, retinopathy, living alone, living in a care home, smoking and excess alcohol consumption.

Key words: Falls, Elderly, Diabetes mellitus, insulin therapy, oral hypoglycemic drugs, Kurdistan

Introduction

The global size of the elderly population is drastically increasing and the burden of non-communicable disease is rising concordantly (1). Although falls can occur at any age, the frequency and severity of fall-related injuries increases with age (2). People over 65 are more prone to falls; the annual incidence of falls increases from 25% at 70 years to 35% at 75 years(3).

Falls in the elderly are a major cause for attending General Practitioners (GPs), and emergency departments. Mechanical falls (i.e. accidental falls) are uncommon among the elderly population (4). Approximately 1 in 10 falls results in a serious soft tissue injury, traumatic brain injury or fracture. Even non-traumatic falls can have serious consequences including decrease in social and physical activities, disability, loss of independence and institutionalization (5).

Diabetes Mellitus (DM) is common in older people; it is estimated that approximately 50% of the patients with diabetes are over 65 years of age(6). The significance of the association between aging, DM and falls has been highlighted by previous studies that found the annual incidence of falls in elderly individuals is 39% (7).

The incidence of falls, particularly recurrent falls, is significantly higher particularly among women who were treated with insulin (8). Furthermore, in addition to the well-known cardiovascular complications, diabetes is associated with several 'geriatric-syndromes' such as cognitive decline, dementia, depression, functional limitations, physical disabilities, visual and hearing impairments, urinary incontinence and chronic pain (9). All of these are causative factors for falls among community-dwelling older people and are therefore likely to explain the excess risk of falls in individuals with diabetes (10).

There are several pathophysiological mechanisms by which DM may predispose to falls; Decreased sensory-motor function, musculoskeletal/neuromuscular deficits, foot and body pain and pharmacological complications (11). Diabetic peripheral neuropathy (DPN) is common among diabetic patients and its incidence increases with age and duration of diabetes.(11) DPN patients with diminished plantar sensation have been observed to reveal increased postural swing associated with significant loss of postural control (12). Apart from DPN, lower physical activity, muscle strength, and poor postural control were also found to be among the significant risk factors that impacted gait patterns and raised risk of falls among the DM population (12).

Those who experience neuropathic pain are frequently managed with psychotropic and other central nervous system mediated medications. Amitriptyline and duloxetine hydrochloride, for example, are commonly used to manage the aching symptoms of diabetic neuropathy. Psychotropic medications are frequently implicated in falls and nearly double an elderly adult's risk for experiencing a fall (23) and having recurrent falls (12,2).

Older adults suffering with diabetes are also more likely to be taking a larger number of medications (12) and seem to be more sensitive to the effects of polypharmacy than similar people without diabetes (13). Patients with diabetes start to experience an increased risk of falling with regimens involving 4 or more prescribed medications. One of the risks managing diabetes is the risk of hypoglycaemia. This can occur with insulin secretagogues and/or insulin use and frequently result in a state of dizziness, and postural instability which increases ones' risk for a fall accident (14).

In summary, there are plenty of opportunities for older adults with DM to experience a fall. Numerous steps to improve balance, strength, and gait in order, have found to reduce risk of falls (15). The majority of published studies on falls are from Western societies and as a consequence the preven¬tion strategies are based on these populations. Sulaimany is a town within Kurdistan; an autonomous region from the Iraqi central government since 1991. The aim of this paper is to explore the risk factors for falls in diabetic elderly patients within this population. In obtaining a more detailed apprehension of the causes of falls in this group in a developing population a more relevant prevention strategy can be established instead of relying upon Western guidance.

Methods

This study is a descriptive cross-sectional study to describe the prevalence of falls among elderly diabetic patients and to compare the prevalence between patients on insulin therapy and patients on oral hypoglycaemic agents.

The data were collected by direct interview between the researcher and patients (person to person questionnaire) in the diabetic centre and emergency department of teaching hospital, Shar-hospital in Sulaimani city, Iraqi Kurdistan in the period from 1st of July 2014 to 31st of June 2015; 150 patients equal to or above the age of 65 years were collected.

They were asked questions relating to the duration of diabetes, monitoring, their perception of occurrence of hypoglycaemic episodes, symptoms and signs of postural hypotension, type of treatments they take for diabetes, history of falls and occurrence of falls within the past 12 months (how many times, if at all, have they had a fall in the last year?). They were also asked about consequences of falls, whether non-traumatic, soft tissue injury and bruises, fractures or head injury; they were asked about their perception of visual impairment and peripheral neuropathy, past medical history and medications, poly pharmacy, social history whether living in institution or living alone or with family; mobility, whether they are walking independently or they use walking aids such as sticks or frames, questions about smoking and alcohol drinking.

A fall was defined as 'an event, which results in a person coming to rest inadvertently on the ground or other lower level'; this was explained to the patient. Information was

sought regarding contact with other medical specialties. We collected data about other risk factors for falls in diabetic elderly.

One hundred and fifty elderly diabetic patients with history of fall were included in this study; 88 (59%) were females and 62 (41%) were males. Their ages ranged between 65 – 90 years, mean age was 77.7 ± 7.11 year, and the mean duration of diabetes mellitus was 15.12±7.36 year.

Results

Results are summarised in the table commencing opposite page, there was an association of increased incidence of falls with increasing age. Mean age of the study population was 77.7±7.11 (95% Confidence Interval (CI) was 63.7-91.6). In this study we found an increased risk in the older diabetic patients (25.3 %) above 85 compared to (14.7 %) of the studied population who were in the age group (65-69). Furthermore, the current study demonstrated higher incidence of falls in females compared to males. These findings were consistent with many previous studies. (16,17)

Moreover, the existing study showed that the frequency of falls increased with the duration of DM, (13%) compared to (26%) for duration (up to 5 years) and (above 20 years) respectively, which is believed to be due to diabetic micro-vascular and macro-vascular complications. A similar finding was illustrated in a study conducted in Homerton University Hospital in the UK (18). It is likely however that if a patient has had diabetes for many years they are likely also generally older, so ideally modelling would need to be done to further determine the effect of duration of diabetes independent of age. Most patients (70%) had a HbA1c level ≥7%, indicating uncontrolled diabetes.

It is apparent that patients on insulin and sulfonylurea agents had the highest rates of falls, while the biggest risk factor identified within the fallers was the presence of diabetic neuropathy. There were significantly higher rates of injury than the reported 1 in 10 rates of injury noted in previous literature, with almost 2 in 3 falls resulting in injury: it is possible that this is the result of the selection methods used, as injuries are more likely to present at the emergency department which was one method of recruiting subjects.

Discussion

Falls are multifactorial and as a result so too are their preven¬tion (19). The risk factor for falls consequently varies between populations and different cultural groups. Identifying the risk factors for falls in elderly subpopulations will allow the design of more specific interventions. Cultural issues should be con¬sidered in falls prevention.

Diabetes Mellitus has been identified as a risk factor for falls and fall-related injuries and fractures in several prospective studies (20). In the period from 1st of July 2015 to 31st of June 2016; 150 patients equal or above the age of 65 years in Sulaimani city/ Iraqi Kurdistan agreed to be enrolled in this study to determine the prevalence of falls among diabetic elderly on insulin therapy and/or oral hypoglycaemic agents and sought to investigate the association of being a faller with a range of putative risk factors within this population.

We examined the association between diabetes and falls among community-dwelling older individuals and found that individuals with diabetes had high risk of recurrent falls. This study affirmed that the prevalence of falls in diabetic elderly on insulin therapy and /or oral sulfonylurea is greater than those on other oral hypoglycaemic drugs. Also a significant relationship exists between falls and increasing age, female gender, longer duration of DM, poor diabetic control, poly pharmacy, peripheral neuropathy, retinopathy, smoking and alcohol drinking. All these findings are supported by previous studies mentioned below.

Furthermore, Kennedy et al, determined that insulin-treated diabetic patients were more likely to present with falls during a hypoglycaemic episode. Also, it showed that patients treated with insulin were more likely to sustain a fracture during the fall (21). This may partly explain why higher rates of injury were seen in our sample.

Amongst oral anti-diabetic medications, the risk of hypoglycaemia is higher in those on sulfonylurea medications than those on other oral drugs (22). Similarly, the current study findings were in line with above research showing higher incidence of falls among those on insulin therapy and sulfonylurea, (20.7%), (16%) or insulin only, (13.3%) on sulfonylurea only. On the other hand, only (8%) were on biguanide which is recognized as the safest drug for older diabetic people with normal renal function.

On another aspect, Tilling et al.(23) reported increased risk of falls with poor glycaemic control (HbA1c > 7%). This conclusion is agreeing with the existent study where (70%) of participants recorded uncontrolled HbA1c. However, patients with HbA1c <6% were also found to be at a higher risk of falls. Therefore, a rigid glycaemic control is usually discouraged in elderly patients (24).

The study has clearly shown a significant connection between falls in diabetic elderly, and diabetes complications namely peripheral neuropathy (56%), and diabetic retinopathy (51.3%). Other studies have highlighted that reduced peripheral sensation and visual impairment secondary to diabetes has been associated with higher incidence of falls (25,26). Finally, this study highlights the extent of polypharmacy, with the majority (61%) of participants studied on 4 or more medications. This correlates with research which revealed that the use of four or more medications is associated with an increased risk of falling (27).

This study has made some steps to uncovering the many fac¬tors that result in diabetic elderly patients to fall in Kurdistan. Only patients who presented to hospital were included. This includes a small number of total diabetic fallers as those who fall in the community and

Age	Number (n=)	Percentage (%)	
65-69 years	22	15%	
70-74 years	28	19%	
75-79 years	30	20%	
80-84 years	32	21%	
≥85 years	38	25%	
Mean age	Years	SD	95% CI
	77.7	±7.11	(63.7-91.6)
Gender	Number (n=)	Percentage (%)	
Male	62	41%	
Female	88	59%	
Duration of Diabetes			
0-5 years	19	13%	
6-10 years	26	17%	
11-15 years	31	21%	
16-20 years	35	23%	
≥20 years	39	41%	
Mean duration	Years	SD	95% CI
	15.12	±7.36	(0.692-29.52)
Type of treatment	Number (n=)	Percentage (%)	
Insulin + Sulfonylurea	31	20.7%	
Insulin + Biguanide + Sulfonylurea	28	18.7%	
Insulin	24	16.0%	
Sulfonylurea	20	13.3%	
Insulin + Rosiglitazone	19	12.7%	
Sulfonylurea + DPP4i	16	10.7%	
Biguanide	12	8.0%	
HbA1c levels	Number (n=)	Percentage (%)	
≥7%	105	70%	
<7%	45	30%	
Lifetime number of falls			
1	49	32.7%	
2	57	38.0%	
≥3	44	29.3%	
Falls within last year	Number (n=)	Percentage (%)	
1	85	57%	
2	65	43%	
Consequences of injury	Number (n=)	Percentage (%)	
Non-traumatic	55	36.7%	
Soft tissue injury	39	26.0%	
Fracture	36	24.0%	
Head injury	20	13.3%	
Total	150		

Risk Factors	Number (n=)	Percentage (%)
Diabetic Neuropathy	84	56.0%
Osteoarthritis	79	52.7%
Diabetic retinopathy	77	51.3%
Hypertension	76	50.7%
Cardiac disease	68	45.3%
Vertigo	39	26.0%
COPD	36	24.0%
Stroke	31	20.7%
Hypoglycaemia	31	20.7%
Foot ulcer	30	20.0%
Ear problems	30	20.0%
Glaucoma/Cataract	23	15.3%
Parkinsons Disease	21	14.0%
Polypharmacy (≥4 prescribed medications)	Number (n=)	Percentage (%)
Present	91	61%
Absent	59	39%
Accommodation	Number (n=)	Percentage (%)
Living alone	70	46.7%
Living with family	61	40.7%
Living in an institution	19	12.7%
Use of walking aids	Number (n=)	Percentage (%)
Present	80	53.3%
Absent	70	46.7%
Smoking Status	Number (n=)	Percentage (%)
Smoker	82	55%
Non-smoker	68	45%
Alcohol Consumption	Number (n=)	Percentage (%)
None	121	81%
Mild-Moderate	17	11%
Severe	12	8%

do not present to secondary care are being missed. By only selecting patients who have sustained an injury it is impossible to calculate the prevalence for all falls. Similarly, certain risk factors and characteristics are potentially being underestimat¬ed. Further studies involving community healthcare is needed to further improve the knowledge of falls and associated risk factors. Such research will also benefit Western countries in establishing fall prevention strategies where there are an increasing non white population (28).

Recommendations

• Oral antidiabetic agents that are least likely to cause hypoglycemia should be the first choice of therapy in those elderly diabetics aged 65 years or above. Metformin and/or dipeptidyl peptidase inhibitors should be used unless contraindicated.

• Avoiding the use of sulfonylureas in patients aged 65 years or above.

• It is better to avoid using insulin therapy unless it is necessary to control glycemic state in older diabetic patients.

• Due to increased risk of hypoglycemia and its complications in this group of population, maintenance of tight glycemic control should be discouraged.

• Consider falls risk specific for the Sulaimany population and may be nationally for Kurdistan.

• Adopting a combined approach to falls management with other specialties and allied health professionals.

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Effects of oxytocin therapy on amount of breast milk in postpartum period in Maternity Teaching Hospital

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Abstract

Background and objective: Early exclusive breastfeeding right after birth plays a significant role in growth and health of neonates; however, a large number of women fail to breastfeed their infants. The present study was aimed at investigating the effects of oxytocin therapy on amount of mother's milk in the postpartum period in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq.

Methods: In the present quantitative investigation, a control-case study design was utilized. It was carried out on 40 breastfeeding mothers immediately after delivery. They were divided into two groups, a case group and a control group. The case group received oxytocin 10 IU during the third stage of labor, while the control group did not. The required demographic data were collected through direct interviews with the mothers, and the amount of their breast milk was determined by pumping 2 hours and 1 week after delivery. The collected data were analyzed using descriptive statistics including frequency and percentage through SPSS 22.0.

Results: The results of the present study indicated that although the case group was given oxytocin 10 IU during the third stage of labor, they did not differ from the control group who received nothing, in regard to the normal amount of their breast milk 2 hours after delivery. One week after the delivery however, the normal amount of breast milk was higher in the case group than the control group, such that 6 mothers in the case group, while only 3 in the control group, had a normal amount of breast milk.

Conclusion: According to the results of the present study, it was concluded that the mothers who had received oxytocin had a significantly higher level of breast milk than the control group; therefore it is recommended it be given to mothers who are diagnosed with probable low amount of breast milk.

Key words: oxytocin, breast milk, breastfeeding, postpartum period

Introduction

Evidence provided by research studies has shown that growth, development, and health of neonates greatly depend on their adequate nutrition during infancy, and that breast milk plays a great role in providing the infants with adequate nutrition [1, 2]. Research has revealed that the rate of mortality caused by infectious diseases is higher among children under 5 years of age who have poor exclusive breastfeeding during their infancy [3]. Despite the significance of breastfeeding during infancy, only 42% of mothers worldwide have been reported to initiate early breastfeeding after childbirth; therefore, 68% of neonates are not fed adequately immediately after birth [4]. Different rates of successful initiation of breastfeeding during the first hours after birth have been reported. For example, 57% of mothers in Qatar, 46% in Uganda, and 29.8% in Kuwait succeeded in carrying out early breastfeeding after delivery [5-7]. Failure to breastfeed has been attributed to lack of breast milk as a result of various maternal, infant, sociocultural, and psychological factors. Included among these factors are the mothers' psychological state, such as depression, stress, and lack of confidence [8]. However, research studies have indicated that stimulation of prolactin and oxytocin hormone can lead to an increase in the production of breast milk [9]. It is also argued that early lactation during the first hour following birth leads to a rise in prolactin which in turn increases milk production if the breast empties completely [10].

Oxytocin is a small neuropeptide that consists of 9 amino acids [11]. Numerous studies have shown that oxytocin plays a great role in regulating social behavior [12-14]. During the first and second stages of labor, as reported by relevant studies, maternal plasma oxytocin experiences a significant increase, but it decreases during the third stage of labor [15]. It is also reported that as a result of being stretched and reacting to hormonal milieu, particularly estradiol, the uterus produces local oxytocin which causes oxytocin levels to decrease suddenly following childbirth [16].

Research has revealed that synthetic oxytocin administered to mothers during labor can increase the level of prolactin [17, 18]; however, results have indicated that intrapartum administration of synthetic oxytocin can lead to incidence of some psychological outcomes such as anxiety and depression two months following childbirth [19].

The relationship between oxytocin administration during different stage of labor and the initiation of lactation and duration of exclusive breastfeeding has been shown in numerous research studies [20-23]. It has also been pointed out that synthetic oxytocin can interfere with the development of the fetal oxytocin system by reaching brain receptors, causing changes in the neonate's behavior [24, 25]. Moreover, it has been indicated that women who are administered synthetic oxytocin in the third stage of labor are less likely to succeed in establishing attachment and breastfeeding patterns [26].

Most relevant studies have focused on the effect of oxytocin on onset of lactation immediately after labor, duration of breastfeeding, and consequences during months following the labor. However, the amount of breast milk as a result of oxytocin administration after labor has not been focused on. In this regard, the present study was carried out in order to investigate the effects of oxytocin therapy using oxytocin 10 IU on the amount of breast milk in the postpartum period in mothers attending the Maternity Teaching Hospital in City, the Kurdistan Region of Iraq.

Materials and Methods

Study design and setting

The present experiment was a quantitative study which was carried out using a case-control design. It was conducted in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq over a period of 6 months from November 2015 to April 2016.

Participants and intervention

The present experiment was carried out on 40 breastfeeding women immediately after their delivery in the Maternity Teaching Hospital in Erbil, the Kurdistan Region of Iraq. They were healthy, underwent full term labor, and their age ranged from 18 to 38 years. They were randomly assigned into two groups, a case group and a control group. Each group consisted of 20 women who were homogenous regarding their age and multi-parity. The case group received oxytocin 10 IU during the third stage of labor, while the control group did not.

Instruments

To collect the participants' demographic data for further analysis, a questionnaire was utilized to carry out direct interviews with mothers. Gloves, syringe, and a manual pump were used to measure the amount of breast milk per feeding 2 hours and 1 week after delivery. The breast milk amount in the two groups was compared and expressed as "normal" or "less than normal".

Data analysis

The collected data were analyzed through descriptive statistics (including frequency and percentage). In so doing, SPSS 22.0 was employed.

Ethical consideration

The ethical approval of the present study was obtained from the Ethics Committee of College of Nursing and Midwifery, Hawler Medical University. Before starting the experiment, the researcher explained the methods and objective of the study to the President of the Maternity Teaching Hospital in Erbil, and necessary permission was provided. Afterwards, the would-be participating mothers were given a thorough explanation on the study's method and objectives, and were assured about the confidentiality of their information and their freedom to quit the study whenever they wanted to. Finally, those mothers who were willing to participate in the experiment were included in the study.

Results

The results of the present study indicated that the participants' age range was 18 to 38 years with the highest frequency belonging to the age group 25-31 (37.5%) followed by 32-38 (32.5%) and 18-24 (30.0%). With regard to their level of education, just over a half of the participants (52.5%) had primary education followed by illiteracy (32.5%), high school (15.0%), and college and higher (0%). The results also showed that 55% of the participants lived in urban areas, while 45% lived in rural regions (See Table 1).

According to the results of the present study, most of the participants (60%) were experiencing their second labor (multigravida), and 40% of them were experiencing their fifth or more childbirth (grand multigravida). It was also observed that 29 women (72.5%) had multipara and 11 (27.5%) had experienced grand multipara. Moreover, the results revealed that most of the participants (60%) had not experienced abortion, 11 women experienced it once, 4 had it twice, and 1 underwent it three times. With regard to the neonates' birth weight, it was seen that most of them (85.0%) had normal weight. Regarding the infants' sex, 23 (57.5%) were male and 17 (42.5%) female. Regarding the mothers' previous labor type, the results showed that most of them (60%) had normal vaginal delivery, 37.5% had normal vaginal delivery with episiotomy, and only 1 woman had experienced cesarean section. It was also observed that most of the mothers (82.5%) had breastfeeding experience. The results also showed that 67.5% of the mothers were skilled at feeding. Furthermore, half of them received oxytocin, while half of them did not. Measuring the amount, 2 hours after delivery indicated that normal amount of colostrum was not observed in any of the mothers. However, one week after delivery, normal amount of breast milk (30 ml) was seen in 7 women, and the milk was given to the babies (17.5%) (See Table 2).

The amount of breast milk among the mothers in the case and control groups was measured 2 hours and 1 week after the delivery. Analyzing and comparing the measured amounts indicated that none of the mothers had a normal amount of colostrum 2 hours after their childbirth. However, 1 week after the delivery, as the results revealed, 6 mothers in the case group and 3 in the control group had normal amounts of breast milk (See Table 3).

Table 1: The participants' demographic information

		Frequency	Percentage
Age group	18-24	12	30.0
	25-31	15	37.5
	32-38	13	32.5
Level of education	Illiterate	13	32.5
	Primary	21	52.5
	High school	6	15.0
	College and higher	0	0.00
Residency	Rural	18	45.0
	Urban	22	55.0

Table 2: The participants' obstetric properties and history

		Frequency	Percentage
Gravida	Primigravida	0	0.00
	Multigravida	24	60.0
	Grand multigravida	16	40.0
Para	Primipara	0	0.00
	Multipara	29	72.5
	Grand multipara	11	27.5
Abortion	0	24	60.0
	1	11	27.5
	2	4	10.0
	3	1	2.5
Weight of neonate	Underweight	1	2.5
	Normal weight	34	85.0
	Overweight	5	12.5
Sex of neonate	Male	23	57.5
	Female	17	42.5
History of previous labor	NVD	24	60.0
	NVD with episiotomy	15	37.5
	C-section	1	2.5
History of previous breastfeeding	No	7	17.5
	Yes	33	82.5
Skill at feeding	No	13	32.5
	Yes	27	67.5
Receive oxytocin	No	20	50.0
	Yes	20	50.0
Breast milk amount 2 hour after labor	Less than normal	40	100.0
	Normal	0	0.00
Breast milk amount 1 week after labor	Less than normal	33	82.5
	Normal	7	17.5

Table 3: The amount of breast milk among the mothers 2 hours and 1 week after delivery

Stage	Group	Breast milk amount	
		Less than normal (N.)	Normal (N.)
Two hours after delivery	Case group	20	0
	Control group	20	0
One week after delivery	Case group	14	6
	Control group	17	3

Discussion

The results of the present study revealed that administration of oxytocin 10 IU during the third stage of labor did not provide any changes in breast milk amount 2 hours after labor; however, a significant increase in the amount of breast milk was observed after 1 week following its administration.

The effects of oxytocin on different dimensions of human behavior, such as maternal bonding, socialization, and sexual behavior, have been considered in numerous studies [27-29]. Moreover, the significant impact of endogenous oxytocin on the initiation of lactation and psychological processes involved in lactation duration has long been known [30], but there are few studies that have focused on the influence of administering synthetic oxytocin (such as oxytocin 10 IU) during the third stage of labor on lactation onset, lactation duration, and lactation amount [31, 32]. The results of the present study indicated that none of the mothers in the case group that received oxytocin 10 IU and the control group that received nothing during the third stage of labor had a normal amount of colostrum 2 hours after delivery; therefore, there was no significant difference between the two groups in terms of the amount of their breast milk 2 hours after delivery. This finding suggests that administering synthetic oxytocin during the third stage of labor does not influence the initiation of breast feeding. Similar findings have been reported by other research studies [33, 34] which contributed delayed onset of lactation to individual factors such as socioeconomic status, smoking, education level, and physiological conditions. Delayed onset of lactation among mothers who receive synthetic oxytocin has also been reported in other studies [35].

Measuring the amount of breast milk 1 week after delivery revealed that the case group that had been given oxytocin 10 IU during the third stage of labor had a higher amount of breast milk compared to the group that received nothing during labor. This finding is in line with the results of the study carried out by Muliani who reported an average amount of breast milk secretion of 40.83 ml as a result of administration of synthetic oxytocin (as cited in Hesti et al. [35]). In their study focusing on the effect of synthetic oxytocin along with breast massage, Hesti et al. observed an increase in the volume of breast milk secretion among those mothers who had received synthetic oxytocin and breast massage [35]. Research has indicated that although administration of synthetic oxytocin increases the volume of breast milk secretion, it has a negative impact on lactation duration [20, 35]. However, the effect of oxytocin on duration of lactation was not taken into account in the present study; therefore, no comparison can be made in this regard.

Limitations of the present study

One of the limitations of the present study was that psychological factors were not taken into account, which may have a great influence on onset, duration, and amount of breast milk. Another limitation was that the amount and duration of breastfeeding were not followed up after 1 week; therefore, no conclusion was made in this regard.

Conclusion

The results of the present study indicated that the mothers in the case group who had been given oxytocin 10 IU had a significantly higher amount of breast milk than the control group. Therefore, obstetricians are recommended to give synthetic oxytocin (such as oxytocin 10 IU) to those mothers who are diagnosed with the possibility or history in the case of mulitgravida of low amount or lack of breast milk so as to ensure the infants' short- and long-term health.

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The crescent trachea: a new radiological sign of subclinical tracheal compression in patients with large goitres

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Abstract

The term goitre refers to an enlarged thyroid gland. This can present as an asymptomatic nodule, or progress to compressive symptoms such as cough/irritation, dysphonia, dysphagia and, in extreme cases, respiratory compromise. We report on a new radiological finding, a 'crescent shaped' trachea, which has been noted in patients with clinically palpable goitres.

This is the first published description of a previously unrecognised radiological sign. Failure to recognise a crescent trachea can result in erroneous under-classification of high-grade goitres. This is important to establish, as tracheal compression may not be obvious on clinical examination nor history, but can result in significant tracheal narrowing.

Recognition of subclinical tracheal compression, based on a positive crescent trachea sign, is a relative indication for surgery, and can help optimise peri-operative management as well as patient safety.

Key words: Goitre, thyroid, thyroidectomy

Introduction

The term goitre refers to an enlarged thyroid gland(1). This can present as an asymptomatic nodule, or progress to compressive symptoms such as cough/irritation, dysphonia, dysphagia and, in extreme cases, respiratory compromise(2,3). Patients may also present with symptoms relating to thyroid hormone imbalance depending on the aetiology. Common causes of goitre include Graves' disease, Hashimoto thyroiditis, familial or sporadic multinodular goitre, iodine deficiency, colloid nodule/cyst and malignancy(2,3). Goitre prevalence varies significantly based on geographic location, with estimates approaching 80% in areas with systemic iodine deficiency, and as low as 1% in high-income countries(1,4).

Case

A 50-year-old man presented with a palpable thyroid mass increasing in size over 3 months without any upper respiratory symptoms. He had no past medical history and took no regular medications. He had no known history of previous radiation exposure, or family history of thyroid cancer. Physical examination revealed palpable thyroid and left neck masses. The trachea was midline and Pemberton's sign was negative. Nasendoscopy was also unremarkable. He went on to have an ultrasound scan of the neck which demonstrated a 40mm left thyroid mass and two left lateral neck masses, up to 49mm in size. Pre-operative Computed Tomography (CT) demonstrated a large thyroid mass and a 'crescent shaped' trachea. This finding has also been noted on other patients with clinically palpable goitres (Figures 1-3). Fine needle aspirate from the thyroid and left neck masses demonstrated a metastatic papillary thyroid carcinoma (PTC) (Bethesda category 6). The patient subsequently underwent total thyroidectomy and central and left lateral neck dissection. Post-operative CT showed almost complete resolution of the crescent shaped trachea (Figures 4 & 5).

Figure 1. The crescent trachea sign (CT scan)

Figure 2. Large goitre causing tracheal deviation and a crescent trachea (MRI)

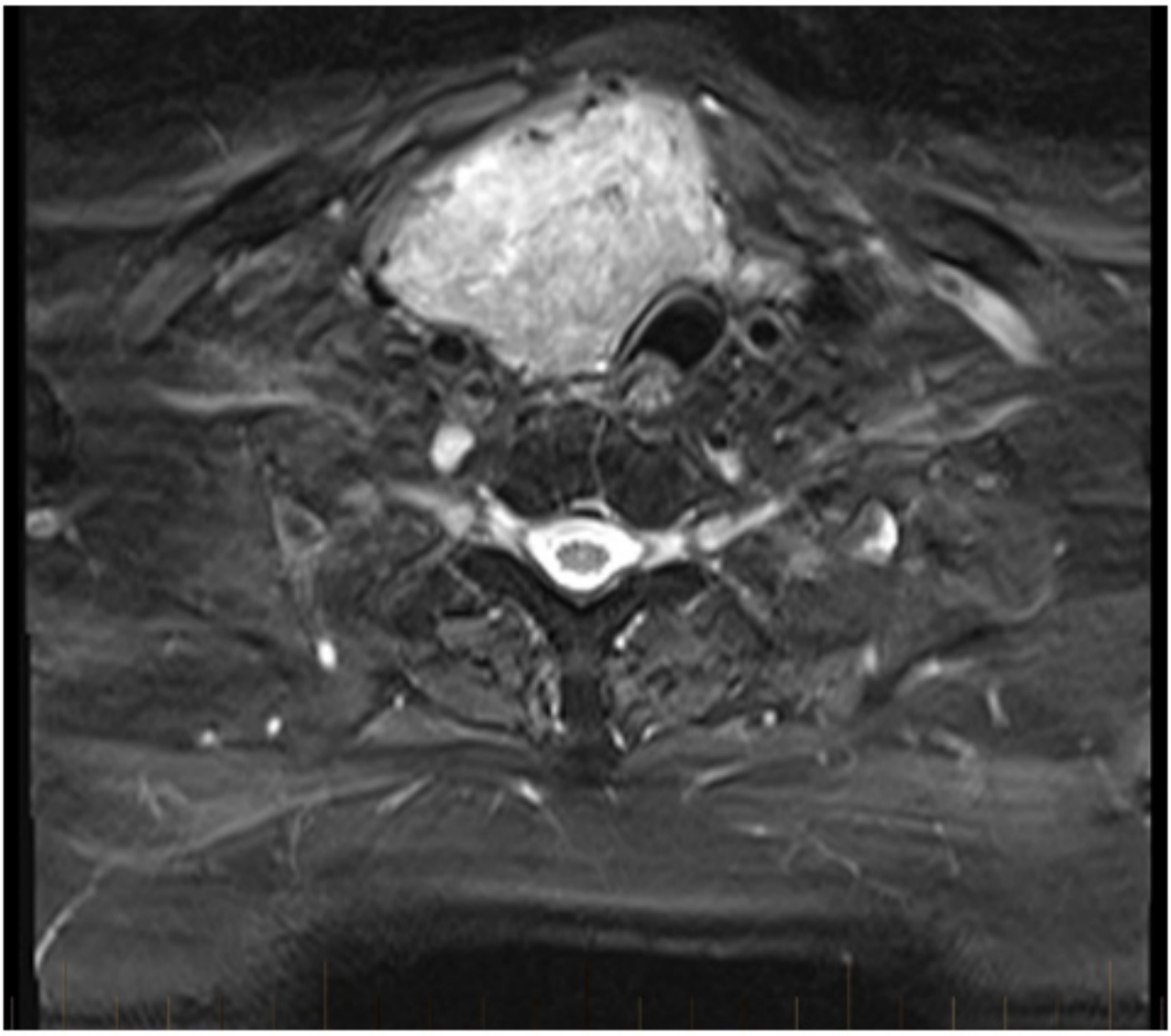


Figure 3. The crescent trachea sign with apparent double-lumen (the posterior lumen is the oesophagus) (CT scan)

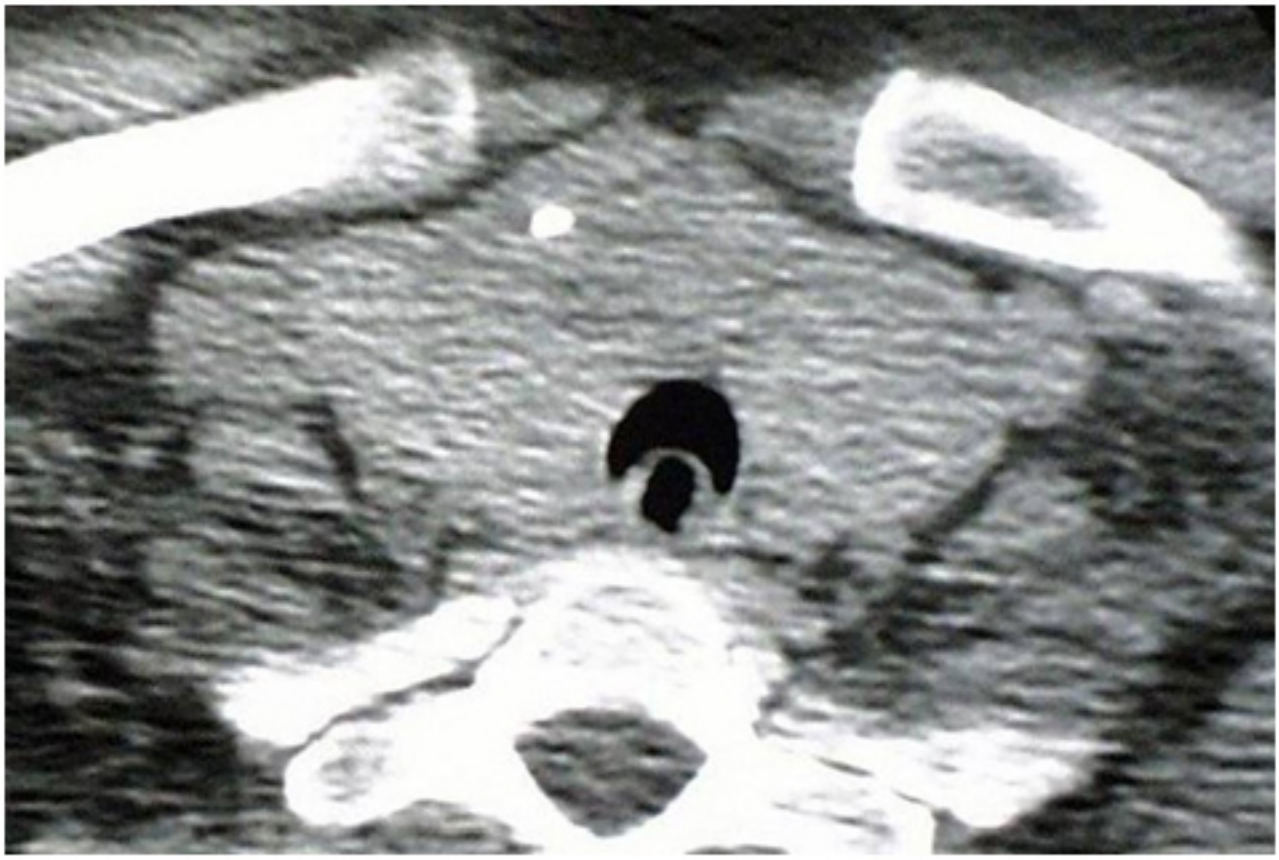


Figure 4. Pre-operative CT scan of the neck demonstrating crescent trachea sign

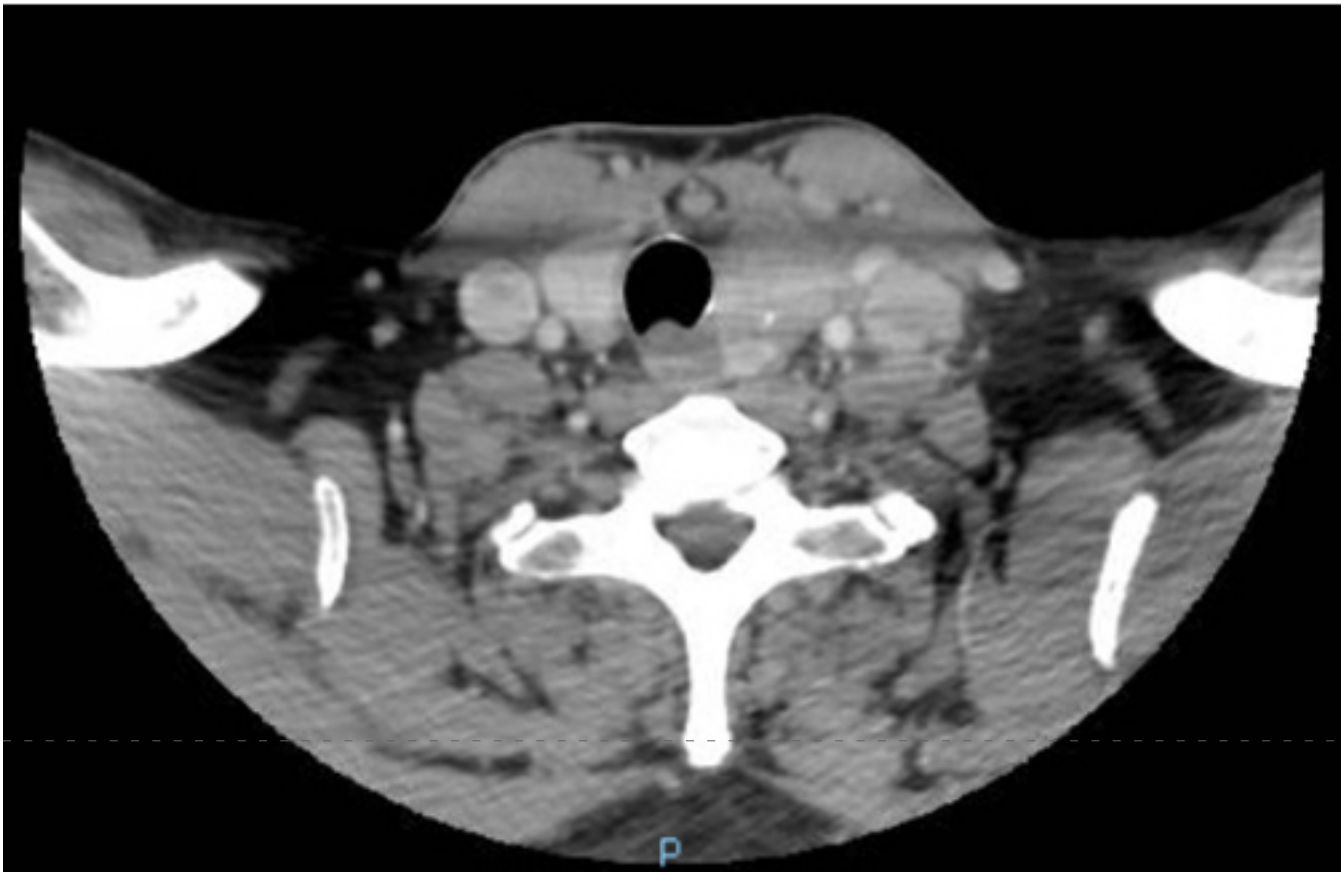


Figure 5: Post-operative CT scan of the neck demonstrating resolution of crescent trachea

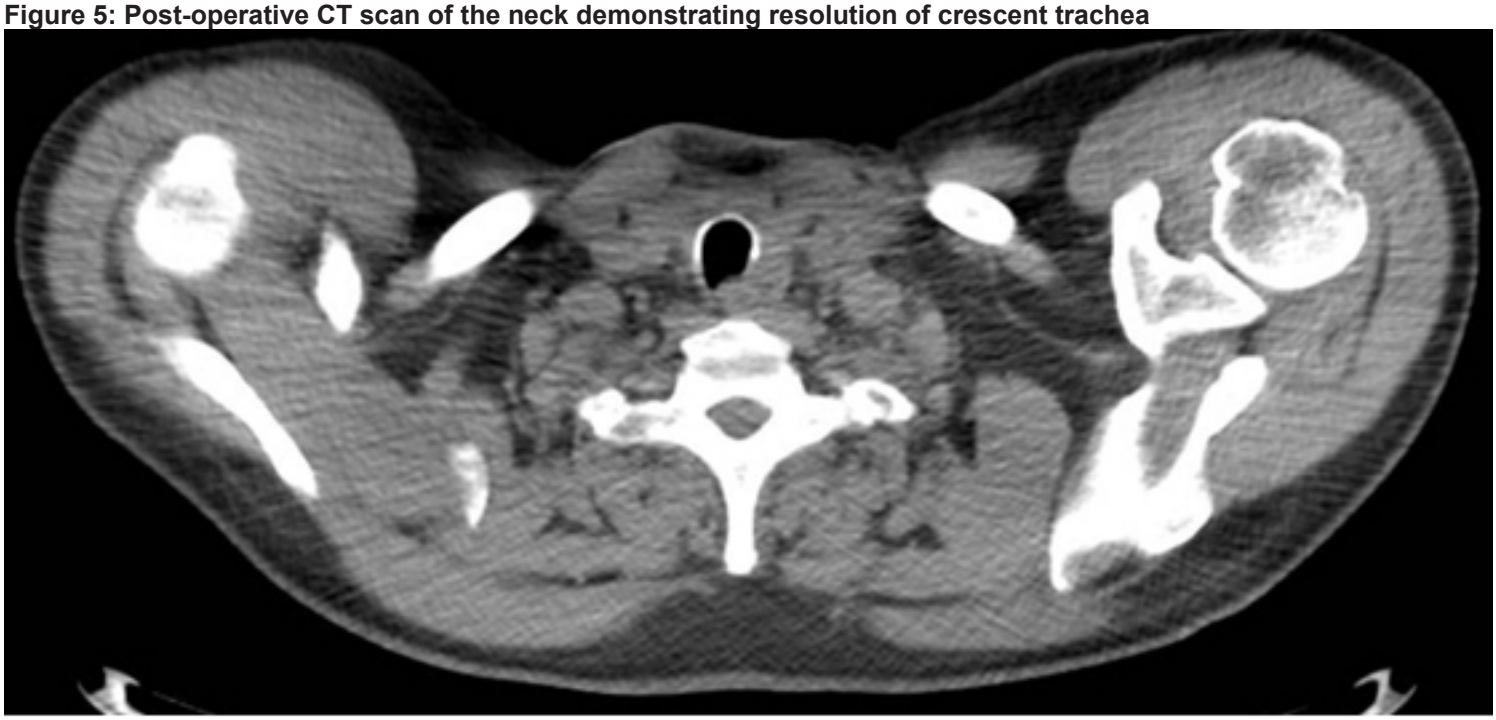


Figure 6: Endo-luminal view of the trachea with cricoid pressure applied demonstrating the crescent trachea shape, in a "normal" patient without a goitre.

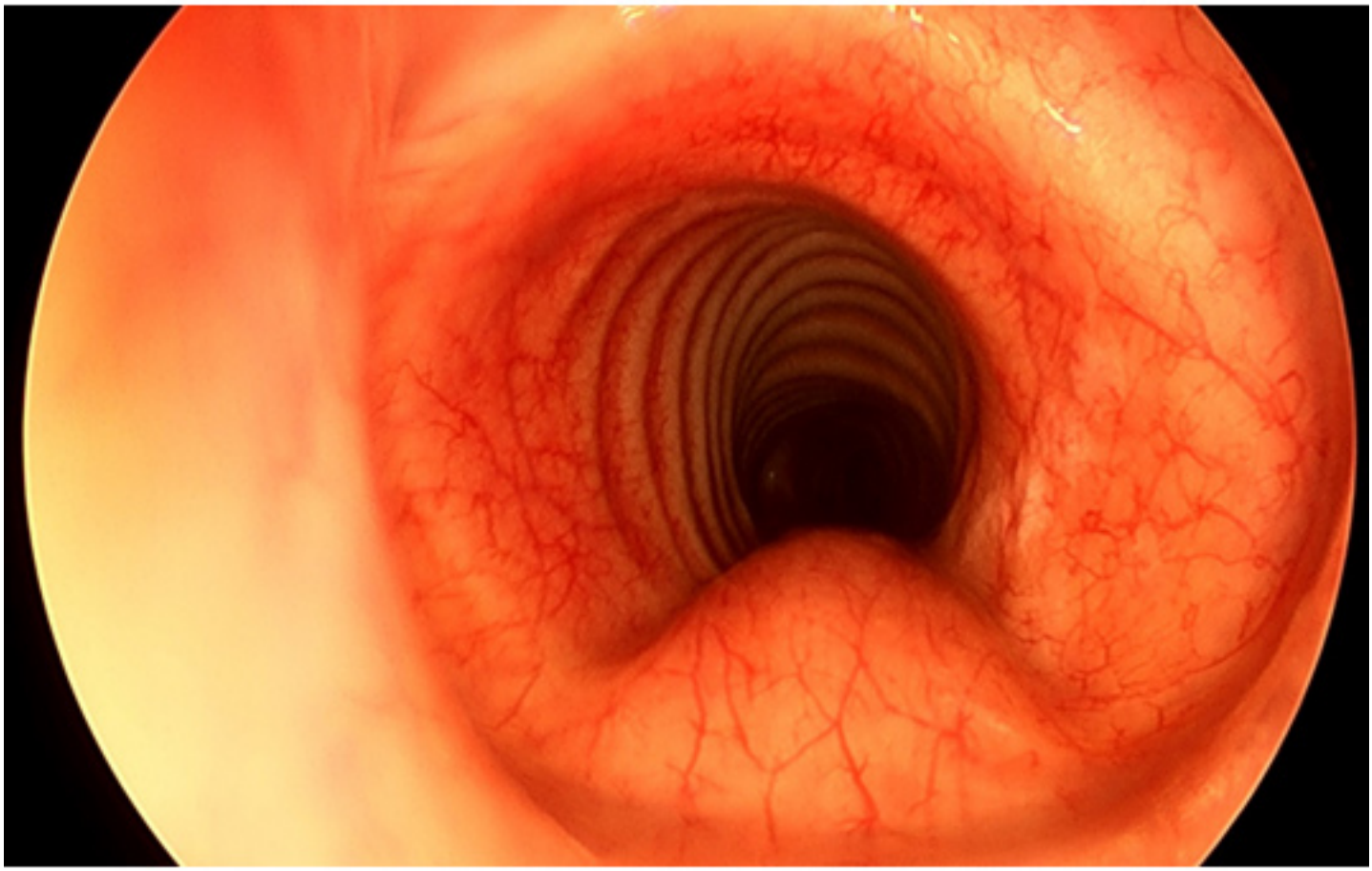
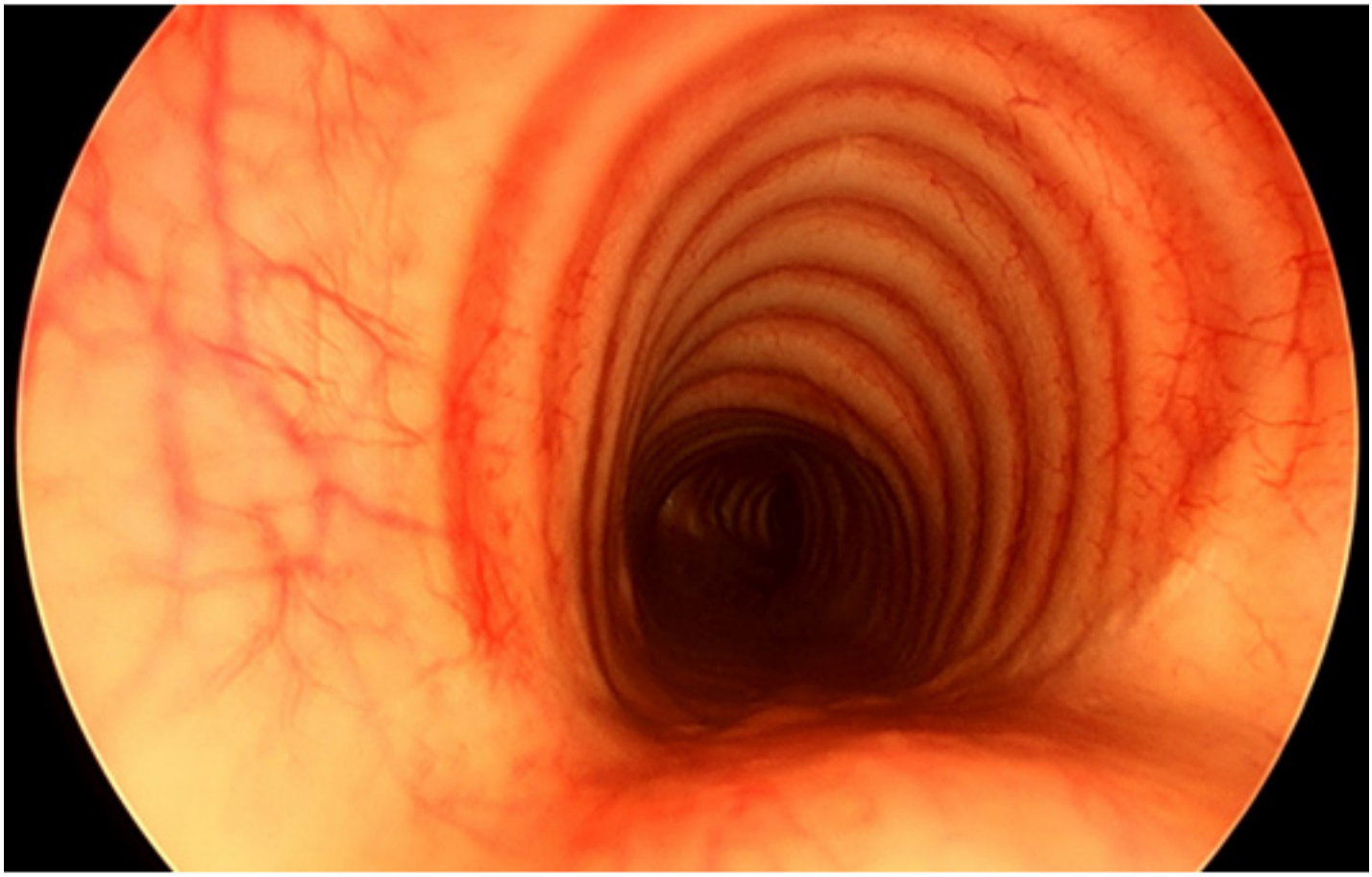


Figure 7: Trachea without cricoid pressure applied showing resolution of the crescent trachea



Discussion

To our knowledge, this is the first published description of a previously unrecognised radiological sign associated with large multinodular goitre. Diagnostic imaging modalities such as Ultrasonography (US), CT and Magnetic Resonance Imaging (MRI), can provide valuable information and assist with clinical monitoring, diagnosis and surgical planning. Surgical planning is particularly important in cases where airway compromise or difficult intubation may be a concern(5).

The World Health Organization classifies goitres based on size from 0-III which can aid in identifying potentially difficult airway cases(1). Class 0 is no palpable goitre, Class I corresponds to a palpable neck mass, Class II a visible, palpable mass that undermines the curves and neckline, and Class III which is a very large goitre with retrosternal extension, tracheal deviation or compression of the trachea or oesophagus(1,6).

Unilateral goitres cause deviation of the trachea to the opposite side, with some degree of side-to side compression. However, the crescent occurs when there is a bilateral bulky thyroid, particularly with retrosternal extension, and if there is a thick isthmus, all of which can compress the trachea posteriorly. This causes the Trachealis muscle to bulge forward, resulting in a crescent shaped trachea. This principle is demonstrated during tracheoscopy performed without an endo-tracheal tube, with simple cricoid pressure, which causes a compressive force similar to that of a large goitre, and thus a crescent trachea shape forms, as shown in the endoscopic photos (Figure 6). If the pressure is removed, the trachea returns to its normal shape (Figure 7).

The case discussed above, and others, that demonstrate a crescent trachea, should be designated as a Class III goitre. This is important to establish, as tracheal compression may not be obvious on clinical examination nor history but may nevertheless result in significant tracheal narrowing. From our experience, these patients often present without any clinically overt signs of respiratory compromise, as they become accustomed to the airway restriction or often have age related co-morbidities that prevent them exercising enough to notice dyspnoea on exertion. Any degree of tracheal compression, however, can provide challenges during surgery, particularly for the anaesthetist(1,4,6,7).

Conclusion

Failure to recognise the crescent trachea sign can result in erroneous under-classification of high-grade goitres. This crescent may not be evident on ultrasonography but seeing the crescent trachea on pre-operative CT or MRI can help in recognising sub-clinical obstruction, even in the absence of a positive Pemberton's sign. This is a relative indication for surgery and can help optimise peri-operative management as well as patient safety.

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What is the relationship between irritable bowel syndrome, smoking, hypertriglyceridemia and fasting plasma glucose?

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Abstract

Background: We tried to understand whether or not there are some significant relationships between irritable bowel syndrome (IBS), smoking, and metabolic parameters.

Method: IBS is diagnosed according to Rome II criteria in the absence of red flag symptoms including pain and diarrhea that awakens/interferes with sleep, weight loss, and fever and abnormal physical examination findings.

Results: The study included 936 patients with the IBS and 346 control cases. Mean age of the IBS patients was 41.0 ± 14.7 (13-86) years. Interestingly, 63.2% of the IBS patients were female. Prevalence of smoking (35.2% versus 20.8%, p<0.001), chronic gastritis (CG) (80.4% versus 15.0, p<0.001), antidepressants use (46.4% versus 16.1%, p<0.001), hemorrhoids (37.1% versus 7.2%, p<0.001), and urolithiasis (22.0% versus 9.5%, p<0.001) and mean values of fasting plasma glucose (FPG) (111.9 versus 105.4 mg/dL, p= 0.002) and triglycerides (167.0 versus 147.3 mg/dL, p= 0.013) were all higher in patients with the IBS, significantly.

Conclusion: IBS may be a low-grade inflammatory process being initiated with infection, inflammation, anxiety, depression, sleep disorders, cancer fear, death fear, and smoking-like stresses, and eventually terminates with dysfunctions of the gastrointestinal and genitourinary tracts. There may be some significant associations between female sex, IBS, CG, depression, hemorrhoids, urolithiasis, smoking, higher FPG, and hypertriglyceridemia. FPG and triglyceride values may be sensitive acute phase reactants indicating some inflammatory processes like smoking and IBS in the body.

Key words: Irritable bowel syndrome, smoking, hypertriglyceridemia, fasting plasma glucose

Introduction

Recurrent upper abdominal discomfort may be the cause of nearly half of applications to Internal Medicine Polyclinics (1). Although gastroesophageal reflux disease, esophagitis, duodenal or gastric ulcers, erosive gastritis and duodenitis, celiac disease, chronic pancreatitis, and malignancies are found among possible causes, irritable bowel syndrome (IBS) and chronic gastritis (CG) may be two of the most frequently diagnosed disorders among all. Flatulence, periods of diarrhea and constipation, repeated toilet visits due to urgent evacuation or early filling sensation, excessive straining, feeling of incomplete evacuation, frequency, urgency, reduced feeling of well-being, and eventually disturbed social life are often reported by the IBS patients. Although many patients relate onset of symptoms to intake of food, and often incriminate specific food items, a meaningful dietary role is doubtful in IBS. According to literature, nearly 20% of the general population have IBS, and it is more common among females with unknown causes, yet (2). Psychological factors seem to precede onset and exacerbation of gut symptoms, and many potentially psychiatric disorders including anxiety, depression, sleep disorders, death fear, or cancer fear usually coexist with the IBS (3). For example, thresholds for sensations of initial filling, evacuation, urgent evacuation, and utmost tolerance recorded via a rectal balloon significantly decreased by focusing the examinees' attention on gastrointestinal stimuli by reading pictures of gastrointestinal malignancies in the IBS cases (4). In another definition, although IBS is described as a physical disorder according to Rome II guidelines, psychological factors may be crucial for triggering of these physical changes in the body. IBS is actually defined as a brain-gut dysfunction according to the Rome II criteria, and it may have more complex mechanisms affecting various systems of the body by means of a low-grade inflammatory state (5). As a result, IBS may even cause CG, urolithiasis, and hemorrhoids (6-8). Similarly, some authors studied the role of inflammation in the IBS via colonic biopsies in 77 patients (9). Although 38 patients had normal histology, 31 patients demonstrated microscopic inflammation and eight patients fulfilled criteria for lymphocytic colitis. However, immunohistology revealed increased intraepithelial lymphocytes as well as increased CD3 and CD25 positive cells in lamina propria of the group with "normal" histology. These features were more evident in the microscopic inflammation group who additionally revealed increased neutrophils, mast cells, and natural killer cells. All of these immunopathological abnormalities were the most evident in the lymphocytic colitis group who also demonstrated HLA-DR staining in the crypts and increased CD8 positive cells in the lamina propria (9). A direct link between the immunologic activation and IBS symptoms was shown by some other authors (10). They demonstrated not only an increased mast cell degranulation in the colon but also a direct correlation between proximity of mast cells to neuronal elements and severity of pain in the IBS (10). In addition to the above findings, there is some evidence for extension of the inflammatory process behind the mucosa. Some authors addressed this issue in ten patients with severe IBS by examining full-thickness jejunal biopsies obtained via laparoscopy (11). They detected a low-grade infiltration of lymphocytes in myenteric plexus of nine patients, four of whom had an associated increase in intraepithelial lymphocytes and six demonstrated evidence of neuronal degeneration. Nine patients had hypertrophy of longitudinal muscles and seven had abnormalities in number and size of interstitial cells of Cajal. The finding of intraepithelial lymphocytosis was consistent with some other reports in the colon (9) and duodenum (12). On the other hand, smoking is a well-known cause of chronic vascular endothelial inflammation terminating with an accelerated atherosclerotic process-induced end-organ insufficiencies all over the body. We tried to understand whether or not there are some significant relationships between IBS, smoking, and metabolic parameters in the present study.

Material and Methods

The study was performed in the Internal Medicine Polyclinic of the Dumlupinar University between August 2005 and March 2007. Consecutive patients with upper abdominal discomfort were taken into the study. Their medical histories including smoking habit, alcohol consumption, urolithiasis, and already used medications including antidepressants at least for a period of six-month were learned. Patients with devastating illnesses including eating disorders, malignancies, acute or chronic renal failure, cirrhosis, hyper- or hypothyroidism, and heart failure were excluded. Current daily smokers at least for six-months and cases with a history of five pack-year were accepted as smokers. Patients with regular alcohol intake (one drink a day) were accepted as drinkers. A routine check up procedure including fasting plasma glucose (FPG), triglycerides, low density lipoproteins (LDL), high density lipoproteins (HDL), C-reactive protein, albumin, creatinine, thyroid function tests, hepatic function tests, markers of hepatitis A, B, C, and human immunodeficiency viruses, urinalysis, a posterior-anterior chest x-ray graphy, an electrocardiogram, a Doppler echocardiogram in case of requirement, an abdominal ultrasonography, an abdominal x-ray graphy in supine position, rectosigmoidoscopy in patients symptomatic for hemorrhoids, and a questionnaire for IBS was performed. IBS is diagnosed according to Rome II criteria in the absence of red flag symptoms including pain and diarrhea that awakens/interferes with sleep, weight loss, and fever and abnormal physical examination findings. An upper gastrointestinal endoscopy was performed, and sample biopsies were taken in case of requirement. CG is diagnosed histologically, and infiltration of neutrophils and monocytes into gastric mucosa is the hallmark of CG (13). Additionally, microscopic examination shows stereotypical changes in epithelium such as degeneration, focal intestinal metaplasia, dysplasia, and glandular atrophy (13). An additional intravenous pyelography was performed according to the results of the urinalysis and abdominal x-ray graphy. So urolithiasis was diagnosed either by medical history or as a result of current clinical and laboratory findings. Body mass index (BMI) of each case was calculated by measurements of

the same clinician instead of verbal expressions. Weight in kilograms is divided by height in meters squared (14). Cases with an overnight FPG level of 126 mg/dL or higher on two occasions or already using antidiabetic medications were defined as diabetic. An oral glucose tolerance test with 75-gram glucose was performed in cases with FPG levels between 100 and 126 mg/dL, and diagnosis of cases with 2-hour plasma glucose levels of 200 mg/dL or higher is diabetes mellitus (DM) (14). Office blood pressure (OBP) was checked after a 5 minute rest in seated position with mercury sphygmomanometer on three visits, and no smoking was permitted during the previous 2 hours. Ten-day twice daily measurements of blood pressure at home (HBP) were obtained in all cases, even in normotensives in the office due to the risk of masked hypertension after a 10-minute education session about proper blood pressure (BP) measurement techniques (15). The education included recommendation of upper arm devices, using a standard adult cuff with bladder sizes of 12 x 26 cm for arm circumferences up to 33 cm in length and a large adult cuff with bladder sizes of 12 x 40 cm for arm circumferences up to 50 cm in length, and taking a rest for a period of 5 minutes in seated position before measurements. An additional 24-hour ambulatory blood pressure monitoring was not required due to the equal efficacy of the method with HBP measurements to diagnose hypertension (HT) (16). Eventually, HT is defined as a mean BP of 140/90 mmHg or greater on HBP measurements and white coat hypertension (WCH) is defined as an OBP of 140/90 mmHg or greater, but a mean HBP value of lower than 140/90 mmHg (15). Eventually, all patients with the IBS were collected into the first, and age and sex-matched controls were collected into the second, groups. Mean BMI, FPG, total cholesterol (TC), triglycerides, LDL, and HDL values and prevalences of smoking, CG, antidepressants use, hemorrhoids, urolithiasis, WCH, HT, and DM were detected in each group and compared in between. Mann-Whitney U test, Independent-Samples T test, and comparison of proportions were used as the methods of statistical analyses.

Results

The study included 936 patients with the IBS and 346 control cases. Mean age of the IBS patients was 41.0 ± 14.7 (13-86) years. Interestingly, 63.2% of the IBS patients were female. Prevalence of smoking (35.2% versus 20.8%, p<0.001), CG (80.4% versus 15.0, p<0.001), antidepressants use (46.4% versus 16.1%, p<0.001), hemorrhoids (37.1% versus 7.2%, p<0.001), and urolithiasis (22.0% versus 9.5%, p<0.001) and mean values of FPG (111.9 versus 105.4 mg/dL, p= 0.002) and triglycerides (167.0 versus 147.3 mg/dL, p= 0.013) were all higher in patients with the IBS. On the other hand, prevalence of WCH, HT, and DM and mean values of BMI, TC, LDL, and HDL were all similar in both groups (p>0.05 for all) (Table 1 - next page). Although the high prevalence of smoking, there was no patient with regular alcohol intake either among the IBS patients or control cases.

Discussion

Smoking-induced vasculitis may be the most frequent vasculitis in society. It is a major risk factor for the development of atherosclerotic end-organ insufficiencies including coronary heart disease (CHD), peripheric artery disease (PAD), chronic obstructive pulmonary disease (COPD), cirrhosis, chronic renal disease (CRD), and stroke (17, 18). Its atherosclerotic effect is the most obvious in Buerger's disease. Buerger's disease is an obliterative vasculitis characterized by inflammatory changes in small and medium-sized arteries and veins, and it has never been documented in the absence of smoking in the literature. Although the well-known strong atherosclerotic effects of smoking, some studies reported that smoking in human beings and nicotine administration in animals are associated with lower BMI values (19). Proof revealed an increased energy expenditure during smoking both on rest and light physical activity (20), and nicotine supplied by patch after smoking cessation decreased caloric intake in a dose-related manner (21). According to an animal study, nicotine may lengthen intermeal time and simultaneously decreases amount of meal eaten (22). Additionally, BMI seems to be the highest in former, the lowest in current and medium in never smokers (23). Smoking may be associated with post-cessation weight gain but proof suggests that risk of weight gaining is the highest during the first year after quitting and decreases with the years (24). Similarly, although CHD was detected with similar prevalence in both genders, prevalence of smoking and COPD were higher in males with the CHD against the higher mean values of BMI, LDL, and triglyceride and higher prevalence of WCH, HT, and DM in females (25). This result may indicate both the strong atherosclerotic and weight decreasing roles of smoking (26). Similarly, the incidence of a myocardial infarction is increased six-fold in women and three-fold in men who smoked at least 20 cigarettes per day (27). In other words, smoking may be more harmful for women regarding the atherosclerotic end-points probably due to the greater BMI and its consequences. Similarly, smoking is consistently higher in men in the literature (18). So smoking is probably a powerful atherosclerotic risk factor with some suppressor effects on appetite. On the other hand, smoking-induced weight loss may be related to the chronic vascular endothelial inflammation all over the body, since loss of appetite is one of the chief symptoms of disseminated inflammation in the body. Clinicians can even understand healing of patients by means of normalizing appetite. Several toxic substances found in cigarette smoke get into the circulation via the respiratory tract, and cause a vascular endothelial inflammation until clearance from the circulation. But due to the repeated smoking habit of the individuals, the clearance process never terminates. So the patients become ill with loss of appetite, permanently. In another definition, smoking-induced weight loss is an indicator of being ill instead of being healthy (21-23). After smoking cessation, appetite normalizes with a prominent weight gain in patients but the returned weight is their normal and physiological weight, actually.

Table 1: Comparison of patients with irritable bowel syndrome and control cases

Variables	Patients with IBS*	*p*-value	Control cases
Number	936		346
Mean age (year)	***41.0 ± 14.7 (13-86)***	***Ns†***	***41.4 ± 14.4 (15-82)***
Female ratio	***63.2% (592)***	***Ns***	***63.0% (218)***
Prevalence of smoking	***35.2% (330)***	***<0.001***	***20.8% (72)***
Prevalence of chronic gastritis	***80.4% (753)***	***<0.001***	***15.0% (52)***
Prevalence of antidepressants use	***46.4% (435)***	***<0.001***	***16.1% (56)***
Prevalence of hemorrhoids	***37.1% (348)***	***<0.001***	***7.2% (25)***
Prevalence of urolithiasis	***22.0% (206)***	***<0.001***	***9.5% (33)***
Mean BMI‡ (kg/m2)	27.2 ± 5.6 (15.0-51.1)	Ns	27.7 ± 5.9 (16.5-49.0)
Prevalence of WCH§	27.7% (260)	Ns	31.4% (107)
Prevalence of HT‖	12.8% (120)	Ns	14.7% (50)
Mean FPG** (mg/dL)	***111.9 ± 42.8 (66-392)***	***0.002***	***105.4 ± 32.9 (70-323)***
Prevalence of DM***	8.3% (78)	Ns	10.0% (34)
Mean TC**** (mg/dL)	199.8 ± 43.9 (105-352)	Ns	196.5 ± 43.6 (110-296)
Mean triglycerides (mg/dL)	***167.0 ± 106.5 (20-622)***	***0.013***	***147.3 ± 102.9 (27-857)***
Mean LDL***** (mg/dL)	125.4 ± 35.8 (10-282)	Ns	124.0 ± 32.5 (54-231)
Mean HDL****** (mg/dL)	46.6 ± 13.5 (24-124)	Ns	45.0 ± 10.3 (26-72)

*Irritable bowel syndrome †Nonsignificant (p>0.05) ‡Body mass index §White coat hypertension ‖Hypertension
**Fasting plasma glucose ***Diabetes mellitus ****Total cholesterol *****Low density lipoproteins
******High density lipoproteins

There may be several underlying mechanisms terminating with the components of IBS in smokers. First of all, smoking-induced chronic vascular endothelial inflammation may disturb epithelial functions for absorption and excretion in the gastrointestinal and genitourinary tracts. These functional problems may terminate with the symptoms and components of IBS including loose stool, diarrhea, constipation, and urolithiasis. Secondly, diarrheal losses-induced urinary changes may even cause urolithiasis (6, 7). Thirdly, smoking-induced sympathetic nervous system activation may cause motility disorders in the gastrointestinal and genitourinary tracts. Lastly, immunosuppression secondary to smoking-induced chronic vascular endothelial inflammation may even terminate with gastrointestinal and genitourinary tract infections causing loose stool, diarrhea, and urolithiasis since some types of bacteria can provoke urinary supersaturation and modify the environment to form crystal deposits in the urine. In fact, 10% of urinary stones are struvite stones which are built by magnesium ammonium phosphate produced during infection with bacteria that possess the enzyme, urease. Similarly, prevalence of urolithiasis was significantly higher in the IBS patients in the present study (22.0% versus 9.5%, p<0.001).

Chronic endothelial damage may be the leading cause of aging by inducing tissue hypoxia all over the body. Probably whole afferent vasculature including capillaries are mainly involved in the process since much higher BP of the afferent vasculature may be one of the major underlying causes of recurrent endothelial injuries. Thus the term of venosclerosis is not as famous as atherosclerosis in the literature. Secondary to the chronic endothelial damage, inflammation, edema, and fibrosis, vascular walls thicken, their lumens narrow, and they lose their elastic nature, all of this reduces blood flow and increases BP further. Some of the well-known accelerators of the disseminated atherosclerotic process are physical inactivity, excess weight, smoking, alcohol, and chronic inflammatory and infectious processes including sickle cell diseases, rheumatologic disorders, tuberculosis, and cancers for the development of terminal consequences including obesity, HT, DM, PAD, COPD, pulmonary hypertension (PHT), CRD, CHD, cirrhosis, mesenteric ischemia, osteoporosis, stroke, early aging, and premature death. They were researched under the title of metabolic syndrome in the literature, extensively (28, 29). Although early withdrawal of the causative factors may delay the terminal consequences, endothelial changes cannot be reversed completely after development of obesity, HT, DM, PAD, COPD, PHT, CRD, CHD, or stroke due to their fibrotic nature (30, 31).

Obesity may be found among one of the terminal consequences of the metabolic syndrome because after development of obesity, nonpharmaceutical approaches provide limited benefit either to heal obesity or to prevent its complications. Overweight and obesity may lead to a chronic low-grade inflammatory process on vascular endothelium, and risk of death from all causes including cardiovascular diseases and cancers that increase parallel to the range of excess weight in all age groups (32). The low-grade chronic inflammatory process may cause genetic changes on the epithelial cells, and the systemic atherosclerotic process may decrease clearance of malignant cells by the immune system, effectively (17). The effects of excess weight on BP have been shown by several authors previously (33). For example, incidence of sustained normotension (NT) was significantly higher in the underweight (80.3%) than the normal weight (64.0%, $p<0.05$) and overweight groups (31.5%, $p<0.05$), and 52.8% of cases with HT had obesity against 14.5% of cases with the NT ($p<0.001$) (34). So the dominant underlying cause of metabolic syndrome appears as weight gain, which is probably the main cause of insulin resistance, hyperlipoproteinemias, impaired fasting glucose, impaired glucose tolerance, and WCH by means of the chronic low-grade inflammatory process on vascular endothelium all over the body (35). Even prevention of the weight gain with physical activity, even in the absence of a prominent weight loss, will probably result with resolution of many parameters of the metabolic syndrome (36-39). But according to our experiences, excess weight may actually be a consequence of physical inactivity instead of an excessive eating habit therefore prevention of weight gain cannot be achieved by diet, alone (40). Additionally, limitation of excess weight as an excessive fat tissue around the abdomen under the heading of abdominal obesity is meaningless. Instead it should be defined as overweight or obesity by means of BMI since adipocytes function as an endocrine organ, and they produce a variety of cytokines and hormones anywhere in the body (35). The eventual hyperactivities of sympathetic nervous and renin-angiotensin-aldosterone systems are probably associated with chronic endothelial inflammation, insulin resistance, and elevated BP values. Similarly, the Adult Treatment Panel (ATP) III reported that although some people classified as overweight have a larger muscular mass, most of them also have excessive fat tissue predisposing to hyperlipoproteinemias, HT, DM, CHD, and stroke, actually (14).

Although ATP II determined the normal triglyceride value as lower than 200 mg/dL (41), WHO in 1999 (42) and ATP III in 2001 (14) reduced the normal limits as lower than 150 mg/dL. Although these values are usually used to define borders of the metabolic syndrome, whether or not more lower limits can provide additional benefits for human health is unclear. In a previous study (43), patients with a triglyceride value lower than 60 mg/dL were collected into the first, lower than 100 mg/dL into the second, lower than 150 mg/dL into the third, lower than 200 mg/dL into the fourth, and 200 mg/dL and higher were collected into the fifth groups, respectively. Prevalence of smoking was the highest in the fifth group which may also indicate inflammatory roles of smoking and hypertriglyceridemia in the metabolic syndrome. The mean body weight also increased continuously from the first towards the fifth groups, parallel to the increased value of triglyceride. As one of the most surprising results, prevalence of HT, DM, and CHD, as some of the terminal end-points of the metabolic syndrome, showed their most significant increases after the triglyceride value of 100 mg/dL (43). In our opinion, significantly increased triglyceride values by aging may be secondary to aging-induced decreased physical and mental activities, which eventually terminates with obesity and other consequences of the metabolic syndrome. Interestingly, the mean age increased from the lowest triglyceride having group up to the triglyceride value of lower than 200 mg/dL group, gradually and then decreased. The similar trend was also observed with the mean LDL and BMI values, and prevalence of WCH. These trends may be due to the fact that although the borderline high triglyceride values (150-199 mg/dL) are seen together with overweight, obesity, physical inactivity, DM, CRD, smoking, and alcohol-like acquired causes, the high triglyceride (200-499 mg/dL) and very high triglyceride values (500 mg/dL or higher) may actually be secondary to both acquired and genetic causes (14). But although the underlying causes of the high and very high triglyceride values may be a little bit different, probably risks of the terminal end-points of the metabolic syndrome do not change in these groups. For instance, prevalence of HT and DM were the highest in the highest triglyceride having group in the above study (43). Eventually, although some authors reported that lipid assessment in vascular disease can be simplified by measurement of TC and HDL without the need of triglyceride (44), the present study and most of the others indicated causal associations between triglyceride-mediated pathways and parameters of the metabolic syndrome (45, 46). Similarly, another study indicated significant association between higher triglyceride values and CHD in Western populations (47).

As a conclusion, IBS may be a low-grade inflammatory process being initiated with infection, inflammation, anxiety, depression, sleep disorders, cancer fear, death fear, and smoking-like stresses, and eventually terminates with dysfunctions of the gastrointestinal and genitourinary tracts. There may be some significant associations between female sex, IBS, CG, depression, hemorrhoids, urolithiasis, smoking, higher FPG, and hypertriglyceridemia. FPG and triglyceride values may be sensitive acute phase reactants indicating some inflammatory processes like smoking and IBS in the body.

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Prevalence and Risk Factors of Childhood Abuse among Hadhramout University Students in Yemen

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Abstract

Background: Violence against children has long been recognized as a social problem throughout the world, and Yemen is no exception. This study aimed to determine the prevalence of various forms of child abuse, as well as identifying its risk factors and outcomes among Hadhramout university students in Al- Mukalla city, Hadhramout Governorate, Yemen

Methods: A cross-sectional analytical study was conducted in five colleges at Hadhramout university in the educational year 2015-2016. A multi¬stage sampling method was used for the selection of students. Data was collected by using Standardized Arabic Version of Child Abuse Screening Tool for Young Adults aged 18-24 years

Results: Overall, 395 students, (57.5%) were males. Of the students (88.4 %) reported exposure to some form of child abuse in the form of emotional (79.2%), physical (75.7%) or sexual abuse (35.2%) of which 12.7% were reported to have been forced into sexual assault. Parents were the main perpetrators of physical and emotional abuse, while persons outside the home were the main perpetrator of sexual abuse. The results showed significant association between child abuse, sex of students and the family environment. Male students were significantly more likely to be physically, emotionally and sexually abused. Child abuse was also significantly more prevalent among students coming from homes with domestic violence and psychological problems among parents. The main outcomes of exposure to child abuse were poor educational performance, anxiety or nightmares, depression, becoming prone to suicide, violent behavior, fear of the other sex and want revenge on the abusers.

Conclusion and Recommendations: Child abuse is a common phenomenon, with long-term adverse effects among Hadhramout university students. Early diagnosis and preventive educational interventions can play a critical role in reducing the prevalence of child abuse and its harmful consequences.

Key words: Child abuse, risk factors, outcomes, Hadhramout university students, Yemen

Introduction

Violence against children has long been recognized as a social problem throughout the world, and Yemen is no exception. Every year millions of children around the world are victims and witnesses of abuse. (1) Published studies have indicated that violence against children is a major concern for public health around the world. (2,3,4) Various international studies have found that 25-50% of all children have suffered severe and frequent violence, although rates may vary by country. (5,1) Every year, 40 million children aged 15 and below worldwide are neglected or abused. (6) The World Health Organization estimated that about 1,300 children die annually throughout Europe and Central Asia after being abused by their caregivers. (7) Globally, about 20% of women and 5-10% of men report being sexually abused in childhood, while 23% of the people reported being physically abused as children. (8)

According to the World Health Organization (WHO) definition "Child maltreatment is defined as all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of the relationship of responsibility, trust or power" (6). Child abuse is a complex process that results from the interaction of certain risk and protection factors at four main levels: individual, family, societal and community level (9). These risk factors are not present in all social and cultural contexts but provide an overview when attempting to understand the causes of child abuse, such as age and gender (10,11) Other risk factors for child abuse by parents or caregivers have also been mentioned in many studies such as low education, age of young parents, unemployment, family environment, and mental disorders of parents such as depression, anxiety and drug abuse. (12,13) The impact of social and demographic risk factors on abuse varies according to the type of abuse. This lack of uniformity in the effects of social and demographic risk factors indicates that each type of abuse has somewhat distinct causes. (14) However, Kellogg et al. Mentioned that child abuse is the result of a set of interrelated familial, social, psychological and economic variables. (15)

Child abuse involves serious physical and psychological consequences that negatively affect a child's health and well-being in general. (16) The child is definitely affected by abuse regardless of form or severity. It weakens the child's physical and mental health and affects his or her risk behavior, resulting in different negative consequences. The life-long consequences of child abuse were found to impair the health of the present and future of children and their well-being in each country and the cultural context in which it was investigated. (17)

There is a paucity of studies on child abuse in the Arab world, which have very different family structures from Western countries that prevail in literature. (18) Arab countries are generally theocratic states, with families that are polygamous, sexually segregated, and extended. Children in the Arabian Peninsula are exposed to all forms of child abuse and neglect. However, the problem is ignored or even tolerated and accepted. Therefore, abused children continue to suffer and most aggressors go free, without punishment and without treatment. (19)

In Yemen, the living conditions for children are dreadful; between violence, poverty, and health problems, dangers of death are their everyday life. Children can be a victim of child abuse in their families or their school or in the general environment. These types of abuse can have serious consequences for their mental and physical health. (20) Child abuse is a violation of the fundamental human rights of the child and is the result of a combination of family, social, psychological and economic factors. Although the problem of child abuse and human rights violations is one of the most important issues on the international human rights agenda, in Yemen, until recently, the government did not intervene and child rights and protection are now being given importance. (20) Moreover, there are certain types of traditional practices that are accepted throughout the country, whether knowingly or unknowingly are to the extent of child abuse. The current socio-economic and political conditions make some children vulnerable and more at risk of abuse, exploitation and neglect. (20) In Yemen documented studies on child abuse are very rare. According to our knowledge, relatively few studies have addressed the problem of child abuse in Yemen, but none of these studies have studied all forms of abuse, particularly sexual abuse and related factors and their consequences, which so far might lead to underestimation of the size of the problem (21-24).

This study is the first attempt to determine the prevalence of various forms of child abuse physical, emotional and sexual abuse, as well as identifying it is risk factors and outcomes among Hadhramout University students in Al-Mukalla city Hadhramout Governorate, Yemen.

Materials and Method

This was a cross-sectional study conducted at Hadhramout University in Al-Mukalla city, the capital of the Hadhramout Governorate, Yemen. The target population consisted of all Hadhramout University students who were available during the academic year 2015-2016 of males and females, aged between 18-24 years old and Yemeni nationality who were invited to participate in the study. A sample size of 384 students was determined by using recommended statistical methods. (25) It was increased to 400 students for an expected non-response and to avoid any missing among participants during the data collection.

A multi-stage random sampling was performed. In the first stage, five colleges were randomly selected which were College of Medicine and Health Sciences, Sciences, Engineering and Petroleum, Arts and Girls. In the second stage, two departments from each college also were randomly selected. In the third stage, the sample size (400)

was proportionally distributed according to the proportion of students in the selected departments for each college. Simple random sampling was applied to select students from each department in selected colleges.

The data were collected by self-reported questionnaire, which consist¬ed of two parts. The first part was a sociodemographic questionnaire developed by the researcher includ¬ing information about students' personal data (gender, age), education and employment status of parents, family income and questions about family structure (living with parents, or with others), number of people living in the same room (Crowding Index). The family living environment, alcohol abuse or drug addiction among parents was also included. Parents at home who argue with each other, hit or hurt each other, the presence of psychiatric problems among one or both parents were also inquired about.

In the second part a stan¬dard Child Abuse Screening Tool (ICAST) self-reported Arabic version questionnaire was used (32). The questionnaire is a multi-country collaborative questionnaire developed by the International Society for the Prevention of Child Abuse and Neglect (ISPCAN) with the assistance of UNICEF and the Oak Foundation. It has been reviewed by more than 100 professionals from different countries, translated into many languages including Arabic, and tested for validation and reliability. It is structured to report all forms of violence against children, more accurately and more representative of the true scope of the problem. This form retrospectively inquires of the the young adult about exposure to any type of child abuse before the age of 18 years. The questionnaire inquired about exposure of students to physical, emotional and sexual abuse. (32)

Emotional abuse was investigated by asking each student about any history of being insulted or criticized, hearing that he/ she was not loved by anyone, or was refused (one wished that he was not born or was dead), or were threatened. In terms of physical abuse, each student was asked about any history of being beaten, punched, or beaten with something that left marks such as a stick, whip, belt etc., kicked, severely shaken, burned, slapped and stabbed. In addition, students were asked about exposure to anyone placing chili in any part of their body to cause pain. With regard to sexual abuse, students were asked about the occurrence of inappropriate sexual behavior by the abuser during childhood, such as being spoken to in a sexual way by an abuser, fondled (their private parts) by an offender, forced to watch /or fondle an offender's private parts, forced to show themself naked, forced to look at pornography or forced into Contact Sexual Assault.

The type of questions was yes / no. Students who answered with "Yes" to any of the above questions (about physical, emotional, and sexual abuse) were asked to report the types of abuse they had experienced and the relationship of the offender to the students (to detail who did it). In addition, the abused students were asked about the impact (outcome) of abuse on their life as to whether they have had poor educational performance, anxiety and nightmares, depressive symptoms, pain of unknown origin, fear of other sex, violent behavior acquired, thinking or attempted suicide or wishing revenge.

A pilot study was conducted among 20 students from two colleges not included in the main study, to ensure that the questionnaire items were clear, understandable and culturally acceptable. Data collected were checked for accuracy and completeness and were coded and entered into the Statistical Package for Social Sciences (SPSS) software version 20. Firstly descriptive statistics was used to present the frequencies and percentages for categorical variables, followed by bivariate and multivariate analysis in order to determine statistical association between the outcome and explanatory variables. Variables which showed significant association in the bivariate analysis were entered into multivariate logistic regression. Logistic regression analysis was done by calculating the adjusted Odds Ratios [aORs], and 95% confidence intervals and P-value level <0.05 was considered significant throughout the study.

Project approval was obtained from Hadhramout University, College of Medicine (HUCOM) and Community Medicine Department. A letter from the College of Medicine to the Dean of each of the five selected colleges was obtained to facilitate the process of data collection. The team followed ethical standards of confidentiality in participation. The objectives of the study were explained to the participants taking into account the moral and social difficulties, and each student was voluntarily invited to participate in the study. If the student agreed to participate, informed verbal consent was obtained from him/ her after confirming that the information to be collected would be used for scientific and research purposes only and the participants were asked not to write their personal identity information. In addition, each student received an envelope with the questionnaire to facilitate the return of completed questionnaire to a special ballot box that had been prepared in advance in each college library selected in the study to better ensure keeping of privacy and confidentiality in the study.

Results

A total of 400 questionnaires were distributed among Hadhramout University students, and all the questionnaires were received which gave a response rate of (100%) in the study. However, 5 questionnaires were excluded because the data was incomplete. The final number of participants was 395.

Table 1 shows the socioeconomic characteristics of the study population. Out of 395 students studied, males constituted the highest proportion (57.5%). Students' ages ranged from 18 to 24 years. The majority (61%) of them were in the age group 20-21 years. More than (70%) of the students' mothers were illiterate (can't read and write) and (87.1%) housewives who do not work outside the home at all, while the majority of students' fathers (90.1%) were educated and employed (94.9%). About two thirds of the

student families (65.1%) had a monthly income > 60000 Y/ R. Most students (84.6%) live with their parents and (38%) live with more than two persons in same room in their home. The same table shows the family environment of students, where 14.1% of parents used alcohol or had drug addiction, 44.8% were arguing and 25.1% hit or hurt each other. While 9.9% of students lived with their parents where one or both suffers from psychological problems at home, and they use guns or knives to hurt or intimidate someone.

Table 1: Socio-demographic characteristics and family environment of Hadhramout University students

Variable	Frequency	%
Sex of the student		
Male	227	57.5
Female	168	42.5
Age group (years)		
18-19	25	6.3
20- 21	241	61.0
22-24	129	32.7
Father's educational level		
Educated	356	90.1
Non educated	39	9.9
Mother's educational level		
Educated	115	29.1
Non educated (Illiterate)	280	70.9
Father's occupation		
Employed	375	94.9
Un employed	20	5.1
Mother's occupation		
Employed	51	12.9
Un employed (Housewife)	344	87.1
Family income in Y/R*		
≤ 60000	138	34.9
> 60000	257	65.1
Crowding index		
1- 2 person/room	245	62
> 2 persons/room	150	38
Living situation		
With parents	334	84.6
With others	61	15.4
Alcohol abuse or drug addiction among one or both parents		
Yes	56	14.1
No	339	85.9
Parents at home argue with each other		
Yes	177	44.8
No	218	55.2
Parents in home hit, or hurt each other		
Yes	99	25.1
No	296	74.9
Psychological problems among parents		
Yes	39	9.9
No	356	90.1

**Y/R = Yemeni Riyal (one US dollar = 570 Yemeni Riyals)*

As shown in Table 2, of 395 students, 349 (88.4%) reported having experienced at least one form of abuse (physical, emotional or sexual) before 18 years of age. Of the three forms of child abuse measured in this study, 20.1% of the students reported that they were exposed to only one form of abuse, 44.4% were exposed to two forms, and 35.5% of students were exposed to all three forms of childhood abuse. The prevalence of emotional abuse among the students was 79.2%, physical abuse was 75.7%, and 35.2% were victims of sexual abuse. The most common types of emotional abuse reported by students were shouting or screaming, criticized or insulted (called by dirty names) and rejected (wished that he/she was never born) at (79.9, 70.7% and 25.2% respectively). The most common physical abuse type was hit/punched, kicked, hit with an object like stick, whip or belt and face slapped, (71.6%, 67.2%, 59.9% and 58.2%) respectively. However, only 12.7% and 4.0% of the students were subjected to physical abuse of a serious nature, including burning or placing chili in any part of the body and threatened with stabbing with knife, respectively. (Table 2)

With regard to sexual abuse, 79.9% of the students reported that they had been sexually spoken to by the abuser (verbal harassment), while 25.9% were forced to touch or view private body parts of the abuser, 20.9% of students had their private body parts fondled by an abuser, and 18.7% were forced to watch pornographic movies. On the other hand, 21.6% of them reported that they had been sexually assaulted. (Table 2)

Table 2: Distribution of students' reported experience of different forms of abuse

Variable	Frequency	Percentage
Exposed to at least one form of child abuse (overall)	349	88.4
One form	70	20.1
Two forms	155	44.4
Three forms	124	35.5
Emotional abuse		
Exposed to emotional abuse (Total)	313	79.2
Types of emotional abuse*		
Shouted or screamed at	250	79.9
Criticized or insulted (called by dirty names)	221	70.6
Heard that he/she wasn't loved	38	12.7
Rejected: wished that he/she was never born	79	25.2
Threatened to be abandoned	60	19.2
Threatened to be hurt or killed	46	14.7
Physical punishment		
Exposed to physical abuse (Total)	299	75.7
Types of physical abuse *		
Kicked	201	67.2
Hit/punched	214	71.6
Hit with an object like stick, whip or belt	179	59.9
Slapped face	174	58.2
Burned or put chili in any part of body	38	12.7
Threatened or Stabbed with a knife	12	4.0
Sexual abuse		
Exposed to sexual abuse (Total)	139	35.2
Types of sexual abuse*		
Spoken to in a sexual way by abuser	111	79.9
Forced to watch pornographic movies	26	18.7
Fondled victim's private body parts by abuser	29	20.9
Forced to view or touch abuser's body private parts	36	25.9
Take photos when the victim is naked (nude photos)	2	1.4
Forced for contact sexual assault	18	12.7

**Each question was asked separately*

Table 3 revealed that, parents were the main perpetrators of emotional and physical abuse, while the persons outside the home were the commonest perpetrators of sexual abuse. Further, other relatives participated in not a small percentage of contact sexual assault.

Table 3: Perpetrators of various forms of child abuse among exposed Hadhramout university students

Offenders / Type of abuse	Parents (%)	Siblings (%)	Relatives* (%)	Teachers (%)	Persons outside home** (%)
Emotional abuse: history of being (N=344)					
Called with bad names	35.2	18.6	19.3	18.5	24.8
Insulted	33.5	6.5	9.4	4.9	12.2
Heard that he/she wasn't loved	22.1	13.7	2.6	1.3	3.6
Rejected	14.3	4.9	4.1	1.0	1.2
Threatened to be abandoned	13.5	1.7	2.0	0.3	2.2
Threatened to be killed	1.8	0.6	3.1	3.2	10.2
Physical abuse: history of being (N= 307)					
Hit with an object as stick, whip or belt	45.1	9.8	8.1	13.0	8.5
Hit/punched	39.5	26.1	5.3	6,5	10.2
Kicked	28.7	20.8	5.8	1.9	8.5
Slapped face	22.8	17.3	9.4	4.9	11.5
Burned or put chili in any part of body	3.2	1.3	2.9	0.3	4.2
Shackled or tried to drown you	0.7	2.9	2.9	1.0	8.5
Stabbed with a knife	0 .0	0.6	0.3	0 .0	1.9
Sexual abuse: history of being (N=158)					
Spoken in a sexual way by abuser	1.9	1.9	9.8	3.8	70.3
Forced to look at pornography	0.0	0.6	2.5	0.0	17.1
Fondled victim's private parts by abuser	0.0	0.6	5.1	0.0	20.9
Forced to view or touch abuser's private parts	0.0	1.3	4.3	0.6	15.2
Photographed the abuser in the nude	0.0	0.0	0.0	0.0	1.3
Forced for contact sexual assault	0.0	1.3	7.3	0.6	12.7

**Relatives: uncles, aunts, cousins, step fathers (mothers), grandfathers (mothers)*
***Person outside the home: friend, neighbor, driver, stranger or others*

To detect the most important factors affecting different forms of child abuse, bivariate logistic regression analysis was first performed. The significance level is set at P <0.05 to ensure that all important variables are covered. The results showed that only students' sex, mother's education and family environment factors had significant association with all forms of child abuse. After determining the significantly associated factors (P<0.05) using bivariate logistic regression, all factors were entered in a multivariate logistic regression model. The results revealed that, there were statistically significant crude associations between the student's sex and family environment. Factors with child abuse persisted after adjusting for other confounding factors, and the strength of associations varied depending on the form of abuse.

As shown in Table 4, child's sex had independent effects on the majority of child abuse risk. Males were more likely to abuse than females. The strongest crude and adjusted associations between student's sex and child abuse were observed for exposure to emotional abuse (AOR=4.44, P ≤ 0.001), followed by physical abuse (AOR=2.56, P≤ 0.01) and sexual abuse (AOR=2.20, P≤ 0.001). The results also showed that, parents who argued with each other at home were the first predictors of emotional abuse of children followed by physical and sexual abuse (AOR= 3.41; 95 % CI: 1.72 –6.77) and (AOR= 2.65; 95 % CI: 1.54 –4.57) and (AOR= 1.75; 95 % CI: 1.11 –2.75) respectively. On the other hand, parents who hit or hurt each other at home were found to be the first predictor also of emotional abuse and physical abuse (AOR= 6.20; 95% CI: 1.86 – 20.67) and (AOR= 4.01; 95 % CI: 1.90 –13.17) respectively. It was also the second risk factor for child sexual abuse (AOR= 2.62; 95 % CI: 1.20 -5.71). Parents' psychological problems was found to be a significant predictor only for physical abuse (AOR= 2.29; 95 % CI: 1.05 –4.97).

Table 4: Logistic regression analysis of child abuse according to students' socio-demographic and family environment

Form of abuse	Emotional abuse		Physical abuse		Sexual abuse	
	Crude OR	aOR	Crude OR	aOR	Crude OR	aOR
Characteristics	**95% CI**		**95% CI**		**95% CI**	
Sex of the student Female **(Ref)** Male	2.64 **	4.44 *** 2.26 - 8.69	2.14**	2.56 ** 1.59 -3,93	1.80 **	2.20 *** 1.36-3.55
Mother's education Non educated **(Ref)** Educated	2.21 *	N/A	N/A	N/A	1.67 *	N/A
Parents argue each other No **(Ref)** Yes	3.47 **	3.41 *** 1.72 - 6.77	3.14***	2.65 *** 1.54 - 4 57	1.86 **	1.75 ** 1.11- 2.75
Parents hit or hurt each other No **(Ref)** Yes	3.50 **	6.20 ** 1.86 -20.67	5.24 ***	4.01 *** 1.90-13.17	2.16 **	2.62 ** 1.20 -5.71
Parents' psychological problems No **(Ref)** Yes	N/A	N/A	7.67 **	2.29 ** 1.05 - 4.97	N/A	N/A

**P < 0.05; **P ≤ 0.01; ***P ≤ 0.001.*
aOR = Adjusted Odds Ratio; CI = confidence interval.
Ref. = reference category. NA: Not applicable

As shown in Table 5, students who experienced emotional abuse were over four times (4.41) times more prone to suicide, (2.97) times more to have depressive symptoms, (2.84) times more to have violent behavior and over two times (2.47) more likely to have anxiety or nightmares compared with students who were not exposed. Table 5 shows also that, students who experienced physical abuse were over three times (3.41) more likely to be prone to suicide, (3.16) times more likely to have anxiety or nightmares, (3.12) times more to have violent behavior and about two times (1.95) more to have depressive symptoms compared with students who were not exposed. Regarding sexual abuse, the same table shows that, students exposed to sexual abuse were (2.95) times more likely to wish revenge on abusers, (2.62) times more have depressive symptoms and (2.44) times more likely to fear the other sex compared with students who were not exposed. The results also showed that students exposed to emotional, physical or sexual forms of abuse were more likely to have poor educational performance (OR =2.63, 2.29 and 1.78 respectively).

Table 5: Logistic regression analysis of child abuse according to resulting outcomes

Form of abuse	Emotional abuse		Physical abuse		Sexual abuse	
	Crude OR	AOR	Crude OR	AOR	Crude OR	AOR
Resulting Outcomes	95% CI		95% CI		95% CI	
Poor educational performance No (Ref) Yes	3.22*	2.63 ** (1.19- 5.8)	2.02** *	2.29*** 1.07 – 4.90	2.72**	1.78* (1.2- 2.9)
Become violent No (Ref) Yes	2.93**	2.84** 1.20- 3.27	4.01** **	3.12*** 1.52 – 6.42	1.85*	NA
Anxiety & nightmares No (Ref) Yes	3.35***	2.47** 1.24- 4.72	3.25** *	3.16** 1.33-7.51	1.48*	NA
Depressive symptoms No (Ref) Yes	3.60**	2.97** 2.2 - 5.7	2.64** *	1.95** 1.02 - 3.5	3.56*	2.62 ** 1.20 – 5.71
Pain of unknown origin No (Ref) Yes	1.79*	NA	NA	NA	1.79**	NA
Fear of other sex No (Ref) Yes	2.05*	NA	2.21*	NA	4.12***	2.44** 1.31- 4.53
Suicidal thought or attempts No (Ref) Yes	2.74 **	4.41 *** 2.21- 6.62	3.59** *	3.41 ** 1.70 – 5.77	3.30**	NA
Wishing revenge No (Ref) Yes	NA	NA	NA	NA	2.04**	2.95 * 1.17- 7.39

**P < 0.05; **P ≤ 0.01; ***P ≤ 0.001.*
aOR = Adjusted Odds Ratio; CI = confidence interval.
Ref. = reference category.
NA: Not applicable

Discussion

Child abuse is a comprehensive term that includes physical, emotional and sexual abuse along with neglect and abuse. The current study is the first of its kind in the study area Al-Mukalla city, Hadhramout governorate to address the prevalence of child abuse in general and its various forms (emotional, physical and sexual abuse), associated factors and outcome among Yemeni university students of both sexes.

Our findings showed that in general 88.4% of Hadhramout university students had experienced at least one form of abuse (physical, emotional or sexual) during their childhood, 44.4% had been exposed to multi-type abuse (two forms) and 35.5% had been exposed to all three forms of abuse. The prevalence of multi-type abuse in childhood in our study is higher than the rates reported by other studies in other countries such as Iraq where 20.0% of students experienced at least one form of abuse and 11.6% were subjected to two or more forms of abuse (27), Egypt 36.6% of students had at least one form of abuse (9%) were exposed to two or more forms of abuse (28), United States found that 13% of participants reported multiple forms of abuse (29) Vietnam where (20.7%) of students have been exposed to two or more forms of abuse, three forms (14.5%) and all forms (6.3%) of abuse, [30]. In Croatia, there was (74%) of students who had been exposed to two or more forms of abuse and all forms of abuse by (5%) of students (31). On the other hand, the prevalence of multi-type abuse in childhood in our study is lower than in the other study conducted in Egypt which revealed that all children (100%) had experienced both physical and emotional abuse (32). The reasons for these differences may be due to methodological differences and the different criteria for categorizing abused and non-abusive participants may also explain variations in our prevalence rates and other rates.

The current study indicated that 75.7% of the students reported that they were victims of physical abuse. Although this rate is relatively higher than reported by other countries in the Region, but it is still lower than the rate reported in former studies, conducted in different parts of Yemen, where the overall rate of child abuses ranges from 55.7% to 81.7% (21-24). The difference between these studies may be due to geographical variation which is an epidemiological characteristic of comparisons within the country, or because of cultural differences in the methods used to punish children. Unfortunately, national studies on child abuse in Yemen are not available to compare with our findings. However, our findings are approaching a high rate observed in studies conducted in Iran (74.4%), Saudi Arabia (61%-76%) Lebanon 76.4% and Egypt (62% -79.9%) (33-36). On the other hand, the prevalence rate of physical abuse 75.5% in our study was relatively high among other Arab countries such as Syria (37), Palestine (38), Erbil in Iraq (27) and Jordan (39), where the prevalence of child abuse is as low as, 45.1%, 28.5%, 6.5% and 2.1%, respectively. Furthermore, our prevalence was found to also be much higher than those stated in Hong Kong 52%, India 47.3%, South Korea 42.2, Iran 36.1%, USA (28.4%), UK 6%-15%, Denmark (5.4%) and Turkey 14.6% (40 - 47).

The findings of the present study showed that the most common physical abuse type was hit/punched, kicked, hit with an object like stick, whip or belt and slapped. This observation is consistent with the result of a study conducted by Dunne and his colleagues where the most common answer in Russia, Egypt, Kyrgyzstan, Malaysia, Colombia and India was “hit/punched” “beaten with an object” (48) and by the other studies (42,47,49). However, only smaller percentages reported exposure to a serious nature of abuse such as burning and stabbing with knife. In contrast, in India Kacker et al found that out of every six abused children one was exposed to a serious form (41).

The current study shows that the main perpetrators of childhood physical abuse are parents, which is consistent with the results of a previous study conducted in Yemen (21,23,24), and in Arab countries, including Iraq, Egypt, Saudi Arabia, Palestine and Kuwait (27,28,49,50,51) as well as with the results of studies from other countries of the world. (52,53) In the Arab world, including Yemen, parents and educators are supported by the legal use of corporal punishment as an educational and disciplinary tool.

In Yemen, Alyaheri studied physical abuse among school children aged 6-12 years; of 1,325 students from the city of Al-Mukalla and 274 students from rural areas in Tuban region, nearly 80% of mothers in the rural area use corporal punishment to discipline children while 59% of mothers were urban. (21) Another study from Yemen by Ba-Saddik et al. of the Aden governorate revealed that more than a half of pupils had experienced at least 1 abusive act by teachers in their school life.)22) A third study by the Social Workers’ Association in Yemen, found that approximately 80% of the children experienced corporal punishment and 1% reported brutal hitting. (23)

A fourth study from Yemen by Al-Thabhani included 586 children, 397 parents, and 33 juvenile children from Social Guidance Centers. Most urban and rural children (88.2%) pointed out that the dominant pattern of treatment by their parents when they make mistakes is punishment. The most commonly used means of punishment against children at home are beating, blaming, hitting with a stick and mocking. (24)

Parents have primary responsibility for protecting their children. In addition, Yemen has enacted a national child rights law that complies with Yemen’s obligations towards international legislation on the rights of the child. (20) However, it is clear from the results of the above studies that there is still a large gap between the law and the practice of parents, teachers and other professionals in Yemen. On other hand, the acceptance of physical punishment as a means of raising children seems to depend greatly on the culture and attitude of the society and relates to child abuse (54,55).

Emotional abuse was found to be the most common form in the present study, similar to the results of other studies conducted in the Arab countries and abroad. (10,28,36,42,49) The highest types of emotional abuse reported in the current study were shouting or screaming, insulting (called by bad names), rejected and not loved by family, which is consistent with the results of other studies (10,48,49). The study revealed that parents were also the commonest perpetrators of emotional abuse. Similar findings were reported in other studies (31,49). In agreement with Machado et al. the mother was the most common perpetrator of child emotional and physical abuse as the mother is considered the main care provider for children in the family and the one responsible for disciplinary practices. (56) This explains the result in the present study as well as in other studies where it is observed that prevalence of physical and emotional abuse is closely related (31,49).

Sexual abuse was rated as the lowest form in the current study; 35.2 % of students reported exposure to some form of sexual abuse during their childhood. A similar rate, 36%, was reported by participants from Central America (57) while a slightly decreased rate was reported in the Los Angeles study (32.3%) (58). Low rates have also been reported from Arab countries such as Egypt 29.8% (59), Lebanon 24% (60) and Saudi Arabia 24.9%. (61) However, evidence about the prevalence of sexual abuse of children and adolescents in the region is small and fragmented, perhaps due to the sensitivity of sexual activity and victimization within Arab countries (61). Sexual abuse can be underestimated in many studies. These studies relied on maternal reporting of sexual abuse of their children, as many mothers may not be aware of the abuse of their children (62). Moreover, sexual abuse is often hidden within families and may not be known until the victim discloses it later in life and may be many children refrain from recognizing their exposure (28).

The most common types of sexual abuse reported by students in the current study were students sexually spoken to by the abuser (verbal sexual harassment), forced students to touch or view private body parts of the abuser, private body parts of the students were fondled by the abuser and they were forced to watch pornographic movies. The types of sexual abuse observed in our study are not different from those observed in the results of other studies from different parts of the world. (49,59) On the other hand, 12.7% of students in the current study reported that they had been sexually assaulted during childhood. Lower rates were reported from India (10.33%), USA (4.5%) and from three Central American countries (5- 8%). (41,44,57)

The main perpetrators of sexual abuse in the present study were persons outside the home such as friends, neighbours, drivers, strangers or others, followed by relatives who also participated in not a small percentage of contact sexual assault (uncles, cousins, etc.). In line with our findings, other studies have reported that strangers are the most common perpetrators of sexual abuse. (49,59, 63)

and a number of psychological problems in adulthood. (39,49,68,69,70)
Sugaya et al in their study in the USA also report that, “many children are so overwhelmed in dealing with their conflicts over the abuse that they may lack the energy to participate in normal activities. However, childhood abuse is also a major trigger of mental illness in later adulthood” (71).

Regarding risk factors, the current study demonstrated that students’ sex and family environment were significantly associated with higher child abuse occurrence. The results of our study revealed that boys were more likely physically, emotionally and sexually abused than girls. Our results agree with the findings of a study conducted in Bahrain in 2001, which documented sexual abuse in 97 children with 74% of boys and 8% of girls who were sodomized (64). Our findings also agree with a systematic review of the prevalence of violence against adolescents in 22 countries of the Arab League where found higher levels of violence among males than females, even for sexual abuse. (65) Some researchers suggest that higher rates of sexual abuse against boys could reflect less supervision and greater freedom of movement among boys than girls in some settings. Girls may be less likely than boys to detect sexual abuse in contexts where girls who have been abused prior to marriage are stigmatized and risk of reprisals by their parents (61,66). However, evidence of sexual differences in the prevalence of violence against adolescents in the Arab region is not strong enough to be mainstreamed and needs further research. (65)

The finding of this study is inconsistent with international statistics that document that 1 in 5 girls and 1 in 20 boys is a victim of child sexual abuse. Self-report studies show that 20% of adult females and 5-10% of adult males recall a childhood sexual assault or sexual abuse incident. (67) On the other hand, a study by Ribeiro et al, from Brazil observed that, sex did not influence the greater or lesser degree of violence among students who were exposed to it. (68) The findings of research on child sexual abuse are often not comparable across studies because of the non-standard definitions of child sexual abuse, different age groups used to distinguish childhood and adolescence, and disparate study groups (68).

Family environment has been significantly associated with increased risk of child abuse in this study and the risk was greater among students who witnessed parents or adults at home hit or arguing with each other compared with those who have no history of violence in the family. These findings are consistent with the findings of other studies that noted that marital violence and child abuse are likely to occur together and that children in families with a history of domestic violence are increasingly vulnerable to all forms of child abuse. (27,50,54) In addition, the existence of psychological problems among parents was a risk factor for child physical abuse in the present study, which is consistent with the results reported in other studies.

factor for child physical abuse in the present study, which is consistent with the results reported in other studies (12,13).

With regard to the outcome, it is clear from the present study that all forms of child abuse are associated with poor educational performance. These results were consistent with the results of studies conducted by Ibrahim et al. In Saudi Arabia (49), Khamis in Palestine (50) and by Sheikhattari et al. in Iran. (69) Our study also revealed a statistically significant association between students' exposure to child abuse and psychological problems later in life. Students who were exposed to physical and emotional abuse were more likely to have anxiety, nightmares, depressive symptoms, suicide thinking, and acquired violent behavior. Students who were sexually abused were more susceptible to depressive symptoms, fear of the other sex, and wanted revenge on the abusers. These results are consistent with the results of other studies that have confirmed the association between childhood abuse and a number of psychological problems in adulthood. (39,49,70,71,72) Sugaya et al In their study in the USA also report that, "many children are so overwhelmed in dealing with their conflicts over the abuse that they may lack the energy to participate in normal activities. However, childhood abuse is also a major trigger of mental illness in later adulthood" (73).

Conclusion

The results of this study indicated that, child abuse is a common phenomenon accompanied with unfavorable long-term adverse effects among Hadhramout university students. More than two-thirds of students (88.4) reported having experienced some form of child abuse. Both emotional and physical abuse are the most common forms of occurrence. The commonest perpetrators in physical and emotional abuse are the parents. While the people outside the home are the masters of perpetrators in sexual abuse. Child abuse is significantly associated with students' sex and familial environment (violence in the family) and psychological problems of parents. The study indicated that child abuse has long-term adverse effects among Hadhramout university students as poor educational performance and the number of psychological problems. Early diagnosis and preventive educational interventions can have a critical role in reducing the prevalence and adverse consequences of child abuse. Further studies are required among larger samples from a broader group of participants to identify different aspects of child abuse

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The Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region

The International Atherosclerosis Society is launching the Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region. The initiative has been made possible by a generous donation from Dr. Wael Abdulrahman Al Mahmeed (Abu Dhabi, UAE). The Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region is a competitive research funding opportunity aimed at advancing clinical and basic research in atherosclerosis and related cardio-cerebrovascular diseases in the MENA Region, as well as promoting partnerships among researchers from recognized MENA Universities and healthcare institutions.

I am pleased to announce that the International Atherosclerosis Society is launching the Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region project. The entire IAS Board is honored and grateful to announce that this high-level initiative has been made possible by a generous donation from Dr. Wael Abdulrahman Al Mahmeed (Abu Dhabi, UAE).

The Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region is a competitive research funding opportunity aimed at advancing clinical and basic research in atherosclerosis and related cardio-metabolic-cerebrovascular diseases in the MENA Region, as well as promoting partnerships among researchers from recognized MENA Universities and healthcare institutions.

Aim of the Wael Al-Mahmeed & IAS Research Training Grants and Fellowships program is to help young researchers to improve skills and knowledge in the field of atherosclerosis and related cardio-metabolic-cerebrovascular diseases in the MENA Region by:

- Acquiring new research techniques
- Implementing new clinical techniques
- Initiating innovative programs in atherosclerosis and related cardio-metabolic-cerebrovascular diseases
- Accepted post-doctoral training in a lipid-intense research laboratory
- Implementing ongoing research in the applicant's laboratory.

The Wael Al-Mahmeed & IAS Research Training Grants and Fellowships for the MENA Region will award up to three $10,000 grants for a maximum period of 6 months. The final granted amount will be calculated pro rata, according to the length of the certified training period or the duration of the research.

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