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Maternal anemia status among pregnant women in Erbil city, Iraq

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From the Editor

This is the eighth issue this year and has a number of well rounded papers dealing with issues relevant to the specialty of Family Medicine

A cross sectional study from Kuwait looked at the determinants of smoking initiation and smoking cessation among oil employees in Kuwait; and assesses their association with demographic and work-related variables. The study included a stratified random sample of 2055 employees from 10 oil companies using a modified version of the standard WHO questionnaire for surveying smoking. The multivariate logistic regression analysis was used to identify the independent determinants for smoking initiation, after adjustment for potential confounders.
The prevalence of former and current smoking among oil employees were 20.6%. The mean age at initiation of smoking was 19.5 years in males, and 24.8 years in females. The authors concluded that educational programs may be organized to educate these employees about the hazards of smoking and encourage them to practice the preventable measures for quitting smoking. The articles of the tobacco-control legislation approved by the National Assembly of Kuwait should be strictly implemented.

In a comparative study the authors looked at the Functional outcome and stability of Arthroscopic Anterior Cruciate Ligament Reconstruction Using Four-Strand Hamstring Graft. Anterior cruciate ligament reconstruction with four-strand hamstring tendon was performed on 24 patients (16 male and 8 female) with ACL rupture. The patients were followed up with clinical examination, Lysholm activity scale and rolimeter. The mean follow up period was 25 months postoperatively; they performed anterior drawer test and Lachman test by the use of Rolimeter. This study concludes that the reconstruction of ACL with four-strand hamstring tendons with the use of staples is practically successful and safe. Additionally, the authors believe that proper graft preparation, accurate tunnel placement, fixation and rehabilitation program are all as important as the choice of graft and fixation material.

A one year retrospective study was conducted in Prince Zaid hospital in Jordan to identify the causes for hospitalization to the pediatric ward, and to analyze the types of illness and the outcome that resulted in hospital admission. A total number of 1530 patients were admitted to the pediatric ward; 746 were male and 784 were female. The most common cause for admission was fever (220), followed by gastroenteritis (196), and bronchiolitis (181). The authors concluded that fever is the most common cause for admission in the ward, this reflects the fact that parents are always worried about their baby being febrile and doctors also keep in mind the serious disease that could be behind the fever.

A cross sectional descriptive analytic study was conducted in primary health care centers in Ismailia city to assess primary care physicians' knowledge, attitude and prescribing practice for acute respiratory tract infections in children aged (2–59) months. It included all primary care physicians. Good knowledge and favorable attitude scores were found among 69.4% & 77.1% of physicians respectively. Inappropriate practices were as indicated by most of the drug use indicators. The average number of drugs per cases (optimal ≤2) was 1.91±0.89. Polypharmacy (optimal ≤3) was found in 22.9% of prescriptions. The authors concluded that good knowledge and favorable attitude were found especially among recently graduated primary care physicians for ARI in children aged (2-59) months, while poor practice as indicated by most of prescribing indicators could be a stimulus for a further postgraduate educational intervention study and implementation of a periodical audit of drug prescribing in clinical practice.

A descriptive cross sectional study was conducted in Erbil city. The data was collected by a direct interview from pregnant women at her 3rd trimester attending primary health care centers; the hemoglobin level of <11 gm/dl considered anemic. The total sample size was 400 pregnant women; their ages ranged from 15 to 44 years (mean ± standard deviation of 26.68 ± 5.917 years). The overall prevalence of anemia was 55.5%, with highest rate among the age group of < 20 years and ≤40 years. Overcrowding index, poor dietary habit, multiparity, low consumption of iron-folate supplements, the presence of specialist doctor and monthly screening for anemia were significantly associated with prevalence of anemia. The authors concluded that high in prevalence of anemia among pregnant women in Erbil city, all the cases are of mild and moderate severity which is associated with many factors like overcrowding, poor dietary habit, gravidity, lack of qualified staff, shortage of iron-folate supplements and poor counseling.

A cross sectional study was conducted in a sample of secondary schools in Baghdad city. A sample of 2690 female students aged 15-23 years were enrolled in the study from 18 secondary schools. Weight and height were measured; thereafter the body mass index was calculated using the formula: weight (kg)/Height (m2). The students were classified as obese, overweight, normal & underweight according to international cut off points and BMI charts matched for their ages.
The study involved 2690 female students, their ages between 15-23 years. Obesity was 9%, overweight occurred in 24%, morbid obesity was only 0.9%. The underweight was 8% in these girls. The study showed a high prevalence of overweight and obesity, among secondary female students. The overweight was the highest among the countries of the Arabian Gulf while obesity was comparable with the neighbouring countries.

A retrospective review of neonates' records admitted to the pediatric department of Al-Wahda teaching hospital in Aden, attempted to determine the frequency of neonatal deaths over a three-year period and to identify the common causes of deaths. A total of 645 neonates died in the pediatric department during the study years. The majority of the neonates (52.7%) were full term, while 47.3% were preterm. Associations between neonatal deaths and the determinants of residence areas, birth weight, gestational age and place of birth were observed ($p < 0.05$).

48% of admitted infants died within the first day of admission and 46% died within the 2nd to 7th days. The authors concluded that the percentage of neonatal deaths increased during the three years, and the majority of neonatal death causes were prematurity and infections. Further studies are needed to find out the true neonatal mortality rates in the hospital and in Aden governorate.

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Original Contribution / Clinical Investigation

Medicine and Society

International Health Affairs

Education and Training

Functional outcome and stability of Arthroscopic Anterior Cruciate Ligament Reconstruction Using Four-Strand Hamstring Graft

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Abstract

In this study, the functional outcome and stability of anterior cruciate ligament reconstruction with four-strand hamstring tendon were evaluated. The purpose of this study is to determine whether the functional outcome and the stability of the knee were or were not related to the diameter of the graft. Anterior cruciate ligament reconstruction with four-strand hamstring tendon was performed on 24 patients (16 male and 8 female) with ACL rupture. The patients were followed up with clinical examination, Lysholm activity scale and rolimeter. The mean follow up period was 25 months postoperatively; we preformed anterior drawer test and Lachman test by the use of Rolimeter. According to the results of these two tests, all the patients had less than 3mm side-to-side difference tibia displacement postoperatively. In addition, only 5 patients had Lysholm scores less than 90 postoperatively whereas 19 patients scored more than 90 postoperatively and the mean of quadriceps muscle atrophy was 1.54cm side-to-side difference. The results demonstrated that the 9mm diameter had a better outcome and stability but there were no significant findings.

This study concludes that the reconstruction of ACL with four-strand hamstring tendons with the use of the staples is practically successful and safe. Additionally, we believe that proper graft preparation, accurate tunnel placement, fixation and rehabilitation program are all as important as the choice of graft and fixation material.

Key words: **Functional outcome, stability, Anterior Cruciate Ligament- Reconstruction**

Introduction

Lange of Munich in 1903 was the first surgeon to attempt an ACL replacement, using braided silk attached to the semitendinosus as a ligament substitute. He replaced the torn ACL of a football player with a loop of silver wire. Three years later in 1917, Hey-Groves published the first report of a procedure to reconstruct an ACL using a tethered fascia lata graft [1]. Almost a century later, autogenous tissue grafts are the most popular choice for ACL reconstruction among surgeons. In the past decade, the annual incidence of ACL injury is approximately 1 in every 3000 people in the United States. As a result, over 100,000 ACL reconstruction procedures are performed each year [2]. An injury to the ACL can result in significant functional impairment. Although reconstruction of the acutely torn ACL (less than 3 weeks after injury) has fallen out of favor, failure to reconstruct the ligament at all can lead to recurrent bouts of instability, damage to the meniscus and articular cartilage, and may accelerate the progression of osteoarthritis for the active individual [3]. Diagnostic tests used to confirm trauma to the ACL include the Lachman test, the pivot shift test, the KT1000/2000 arthrometer, and the rolimeter. MRI is also used because it provides the fine soft tissue detail necessary for a definitive diagnosis. Choosing a graft includes taking into account many variables; the anatomy of the native ligament that is being replaced, the biomechanics, biology, initial fixation strength, morbidity of harvest, ease of harvest, and return to play time all must be considered. ACL reconstruction aims to restore stability to the knee. The surgeon chooses which graft will be the best to accomplish this goal. The ideal graft reproduces the anatomy, the biomechanics of strength and the stiffness of the native ACL. It allows

rapid and complete biological incorporation, has strong initial fixation and gives low or no morbidity from harvest to the patient [4]. Various authors have reported the patella tendon graft to be 138 - 170% stronger and 125% stiffer than the original ACL. On the other hand, the S/G combination is said to be 200% stronger and 300% stiffer than the original ACL [5]. In the last two decades, ACL reconstructions have been most often performed with patellar tendon and hamstring grafts due to the comfort provided by the arthroscopic techniques. These grafts have become to be considered as the standard for ACL reconstruction both because of their high biomechanical and biological compatibility as well as for their low morbidity. Until the late 1990s, the patellar tendon was accepted as the gold standard for ACL reconstruction because of studies that reported high success rates with its use. However, recent improvements in tendon fixation materials have increased the success of reconstruction procedures using hamstring techniques [6].

Published outcomes, both short and midterm, have been favorable with regard to postoperative stability, functional scores, and return to activity. These same results, however, have revealed a subset of 10% to 30% of patients who have not had such favorable outcomes. Objective outcome measures, such as anteroposterior laxity, pivot shift, and Lysholm knee scores, have demonstrated that a subpopulation of patients have residual laxity or functional deficits that prevent a return to previous levels of activity and function [7].

In this study, the main objective was to analyze the functional outcome and stability of Arthroscopic ACL Reconstruction using a four-strand hamstring graft, including these specific objectives:

- Compression between stability and graft diameter (8 and 9 mm graft). (By performing the anterior drawer and Lachman tests with use of rolimeter.)
- Compression between functional outcome and graft diameter (8 and 9 mm graft) (by using the Lysholm score scale)
- Compression between atrophy and graft diameter (between 8 and 9 mm graft)

Methodology

This chapter includes the type of research, community of research, sample of research, sampling methods and sample description, place of research, the tool measuring data and the method of collecting the data, the procedure of research, the Limitations of research and ethical concerns.

Type of research

The type of this research was cross-sectional; in this study the researcher performed a comparative analysis of the variables (functional outcome, stability and quadriceps muscle atrophy) of the ACL reconstructed cases. The variables were first described and then we compromised the variables.

The community of research

The community of research was comprised of the patients who had ACL Reconstruction in Traumatology department of Uszoki Hospital at Semmelweis University by Dr. Bodo. All of the patients were Hungarian and the minimum age was 20 years old. Each patient had the surgery at least 6 months prior to the examination we performed.

Sampling methods

Sampling was consecutive, thus the researcher himself continually examined and observed the cases in the traumatology department of Uszoki Hospital. First we expressed the purpose of the research to the cases and guaranteed that all personal information given in the questionnaire would remain confidential. The sampling took approximately four months.

Sampling description

All 24 patients had symptomatic ACL rupture treated by Arthroscopic ACL reconstruction with four strand Hamstring graft. The postoperative period was between 6 to 40 months (a mean post-operative period is 25 months). All patients were assessed by rolimeter and with the use of anterior drawer and Lachman tests, followed by a side-to-side difference tibia displacement calculation. The clinical evaluation was assessed by using the Lysholm Knee Scale. It is scored by adding the responses to 8 factors assessing knee function and activity and transforming the score to a scale of 0-100. We measured the atrophy of the quadriceps muscle from the upper one third of the thigh and then calculated the side-to-side difference. The surgeon performed the pivot shift test. In all cases a four strand Hamstring auto graft was used with 8 and 9 mm diameter. The arthroscopic procedure was performed in all cases. The graft was fixed by using end button in the femur and two staples on the tibia.

Results

In this study we examined 24 patients, 16 males and 8 females, between 20 to 45 years old (32±6.427). The follow up time was from 6 to 40 months (mean 25 months). From these 24 patients 20 were right leg dominant and 4 were left leg dominant and 18 patients had ACL reconstruction on the right knee and 6 on the left knee. The minimum BMI was 17.92 and the maximum was 30.42 (mean 24.23 BMI) (Table 1).

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	24	20	45	32.46	6.427
BMI	24	17.92	30.42	24.237	3.215
Months after Surgery	24	6	40	25.125	11.975

Table 1: The Mean and SD of Age BMI and post-surgical follow up examination

	n	Minimum	Maximum	Mean	SD
Anterior drawer test side to side difference (mm)	24	0	2	1.208	0.779
Lachman test side to side difference (mm)	24	0	3	1.416	0.974
Lysholm score	24	89	100	96.416	4.51
Atrophy	24	0	4	1.541	0.977

Table 2: Mean and SD of side to side difference of anterior drawer and Lachman tests, atrophy and Lysholm scale

The Lysholm knee score was calculated postoperatively between 0 and 100 (mean 96.41), and only 20% of the patients scored under 90. Pivot shift test result was negative for 79.2% patients and grade 1(slight) for the 20.8% of the patients. The results of anterior drawer and Lachman test by the use of Rolimeter show the mean side-to-side difference of 1.2 mm for the anterior drawer test and 1.41 for the Lachman test. Two cases had similar test results in both Lachman and anterior drawer test. 45.84% of the cases had 1 cm side-to-side difference in quadriceps muscle circumference and the mean side-to-side difference of quadriceps atrophy was 1.51 cm (Table 2). None of the cases that were included in the study were re-operated due to secondary degenerative chondral or meniscal lesion. The results showed that 80% of the cases had excellent result, more than 90 on the scale, although 20% of the cases had good result; they scored between 80 and 89 on the scale. All the patients that were included in our study returned to their social, professional and athletic activities.

Discussion

Feller et al. [3] examined the laxity at four months post ACL replacement status. The mean anterior tibial displacement for the hamstring group was 1.2 ± 1.1 mm versus 0.5 ± 1.1 mm for the BPTB group at 67N. This was consistent with the results of Witvrouw et al. [8], who found laxity at 67N in a hamstring graft group as compared to a patellar tendon group at six weeks (1.4 vs. 0.5 mm), three months (1.6 vs. 0.6 mm), and six months (2.1 vs. 0.9 mm) but no significant difference existed one year after surgery (1.4 vs. 1.1 mm).

We found that the mean side-to-side difference of tibial displacement was 1.2 mm for anterior drawer test and 1.41 mm for the Lachman test (Table 2).

The Lysholm knee score was used for evaluating the outcome of ACL reconstruction of patients. Since 1985, the Lysholm knee scoring scale has been used for its sensitivity and the reliability of the surgery [9]. The Lysholm knee scale is a condition-specific outcome measure that was originally designed to assess ligament injuries of the knee [10]. A few studies have reported the accuracy of the rolimeter as compared to the KT1000 arthrometer by differentiating an ACL deficient knee from a normal contra lateral knee. Ganko et al. [11] examined 20 normal knees and 18 knees with chronic ACL deficiency in order to assess the reliability of the rolimeter compared with the KT1000 arthrometer. They reported that in ACL deficient knees the absolute anterior or posterior tibial translation and the difference (in mm) between injured and normal contra lateral knees (side-to-side difference) did not differ significantly between the devices. In normal knees the rolimeter measurements showed slightly smaller anterior or posterior tibial displacements than with the KT1000 arthrometer. It is very important to determine the difference (in mm) between injured knees compared with normal contra lateral knees as the grade of final evaluation in recognition of ACL injury or deficiency where the differences are greater than 3 mm [12].

Quadriceps weakness and atrophy is present following ACL reconstruction. This is a consequence of immobilization and disuse of the quadriceps muscle following ACLR. Konishi; et al. [13] reported an approximately 7% deficit in total quadriceps muscle volume in the reconstructed versus contralateral limb in individuals between 6-12 months post-operatively.

The magnitude of the reported strength deficits varies, but may be as high as 30% in the reconstructed compared to the contralateral limb 6-months post-operatively a time when individuals often return to full activity. Further, this weakness has been shown to persist for years after reconstruction, with deficits between limbs upwards of 20% being reported seven years post-operatively.

Studies regarding ACL reconstruction in older individuals showed an inferior result in the past. Conservative management of ACL rupture for ages over 40 years was therefore suggested. Recent studies have shown equally good results for ACL reconstructions over 40 years [13] [14]. The result of stability and functional outcome were excellent and there were no significant differences between this age group and the younger cases. It is well accepted that an inferior surgical technique and malpositioning of the tibial or femoral tunnels are the main causes for a worse clinical outcome. Moreover, the post-operative physiotherapy protocol and the fixation of the graft within the tibial and femoral tunnels may affect the final clinical result [15].

According to the original objectives of this study examining the antero-posterior stability of the knee joint, we demonstrated that difference of the side-to-side tibial displacement

was less than 3mm, so the knee joint is stable in all cases. Secondly, the analysis of the functional outcome of the knee joint showed excellent results. Regarding our study, reconstruction of the ACL by using four strand hamstring with 9 mm diameter shows a better result in stability and outcome and atrophy in the cases but the t-test showed no difference in outcome and stability of 8 mm and 9 mm graft and was not significant. In addition, we have shown that, ACL reconstruction by using four-strand hamstring tendon graft is safe and highly successful with very few complications.

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Causes for hospitalization in Pediatric Ward in Prince Zaid Hospital

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Abstract

Objective: To identify the causes for hospitalization to the pediatric ward in Prince Zaid Hospital, and to analyze the types of illness and the outcome that resulted in hospital admission.

Method: This is a one year retrospective study conducted in Prince Zaid hospital in south of Jordan. All case files of admissions to the pediatric ward from January 2011 to January 2012 were reviewed and analyzed. Cause of admission, duration of hospitalization, outcome, personal characteristics and mortality were included in the analysis. Surgical cases were excluded.

Result: A total number of 1530 patients were admitted to the pediatric ward, 746 were male and 784 were female. The most common cause for admission was fever (220), followed by gastroenteritis (196), ND bronchiolitis (181). Deaths were (8) patients, 28 patients were transferred to the ICU and 230 were transferred to another hospital. March is the month for the most admissions with 249 admissions and October with the least admissions (159). The mean duration for admission was 2,663 days. About 205 were discharged against medical advice.

Conclusion: Fever is the most common cause for admission in our ward. This reflects the fact that parents are always worried about their baby being febrile and doctors also keep in their mind the serious disease that could be behind the fever. The large number of patients needing referring to another hospital may be indicative of the need for some subspecialty in our hospital and the lack of some advanced investigations that we need in our hospital.

Key words: hospitalization; morbidity; mortality.

Introduction

The health of the child is essential; nations pay every effort and activity toward improving kid`s health.
It is believed that over 5 million deaths occur annually in developing countries in children during their first months of life (1).

According to the national center for health more than 3.5 million kids under the age of fifteen are hospitalized each year. Variation in disease incidence is a major factor in the determination of hospital admission rate, but this is not the only factor which explains the geographic variation in pediatric hospitalization (2, 3). Over the last decade, a number of initiatives have been developed to improve the health of the global pediatric population. One such initiative is the Children's Environmental Health-Indicator Diseases of the World Health Organization. When trying to assess the needs for children in terms of beds in pediatric wards, disease patterns and hospital utilization needs to be studied. Mortality rate in children is a reliable pointer of health in a population and it is an indicator of adequacy of health care in that area (4, 5, 6). Evaluation of child mortality in hospital gives a view of the main medical disease in kids and helps to take measures in order to overcome them (7).

Method

This is a one year retrospective study conducted in Prince Zaid hospital in Tafileah.

Tafileah is a city located in the south of Jordan, with approximately 80 thousand population. Prince Zaied hospital is a military hospital; it is the only public hospital in the region, with a capacity of 88 beds. The hospital has a 23-bed inpatient pediatric unit, a 10-bed neonatal care unit with three ventilators and two nasal

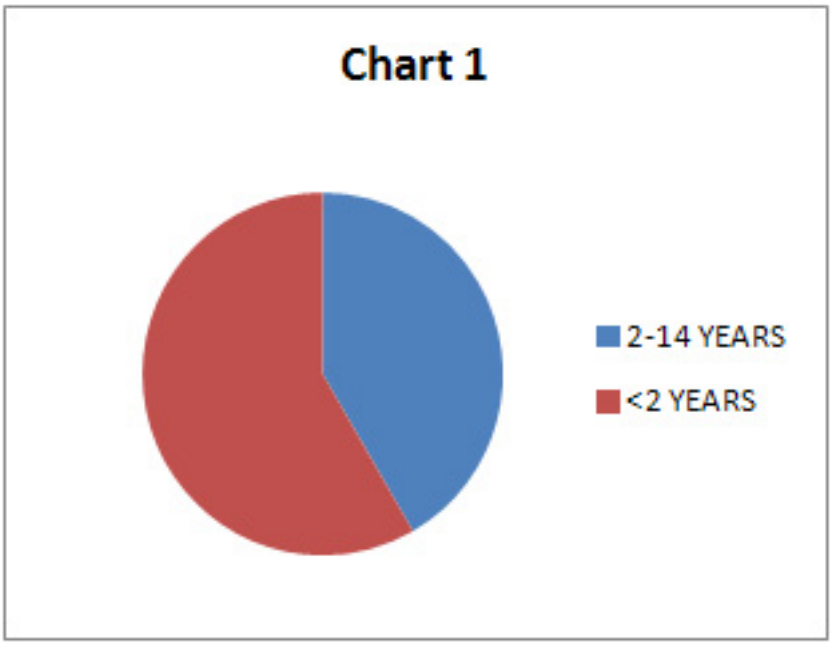
CPAP. It is a three level hospital and patients come here from as far away as 90 kilometers for treatment as it is the only hospital with specialists in that area.

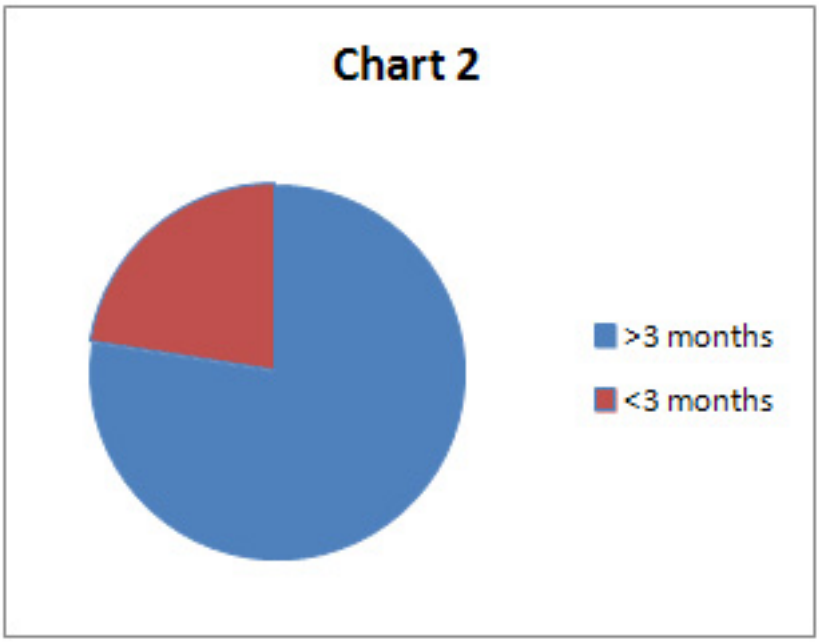
All medical records for patients under 14 years of age admitted to the pediatrics ward from January 2011 to January 2012 were reviewed and analyzed. For each patient, there were recorded data on: cause of admission, duration of hospitalization, outcome, personal characteristics and mortality, included in the analysis. Surgical cases were excluded.

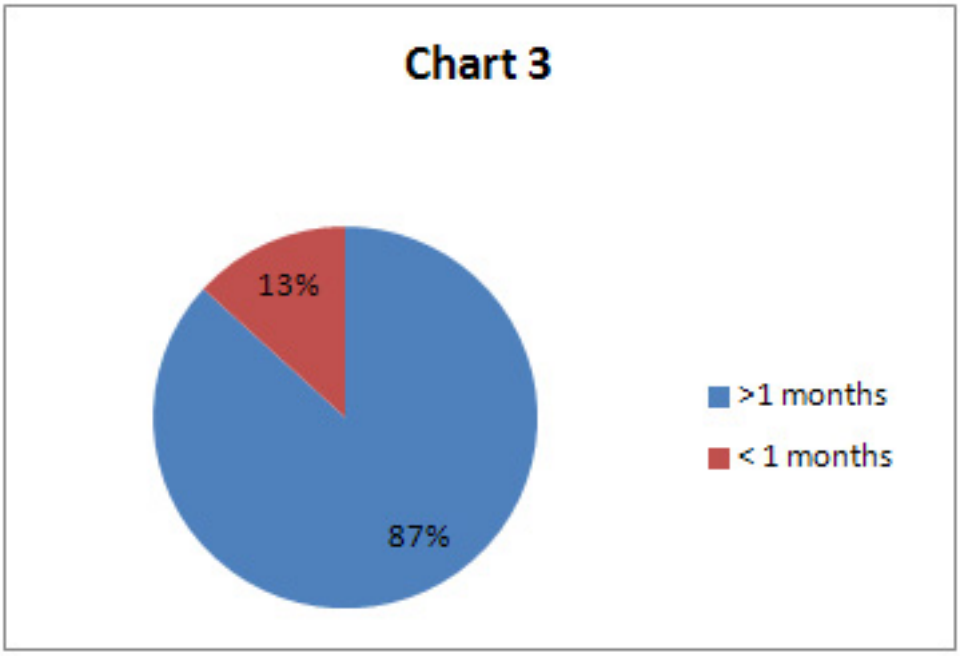
Sick children brought from home were seen in the outpatient pediatrics clinics or in the emergency department, where resident pediatricians decided the need for admission. Patients were routinely investigated according to a standard protocol with complete blood count (CBC), plasma electrolytes, blood culture; lumbar puncture was performed as part of the routine "septic screen" in all neonatal admissions with suspected sepsis. Chest radiography was possible to perform at any time: in the evening, at night, or at the weekend. Interventions available included oxygen, antibiotics and other drugs, intravenous fluids, parenteral nutrition, nasogastric feeding, phototherapy, and exchange transfusion. The clinical care during admission was supervised by a pediatrician who was also assigning the final diagnosis at the end of the admission after review of the case notes and the results of all pertinent investigations. Follow up appointment 2-3 weeks after discharge, was routinely done.

Result

A total number of 1530 patients were admitted to the pediatric ward during the study period; of these 746 were male and 784 were female. About 892 (58.3%) patients were below the age of 2 years, 347 (22.6%) patients were below the age of 3 months and about 204 (13.3%) were below the age of one month (Charts 1.2.3).







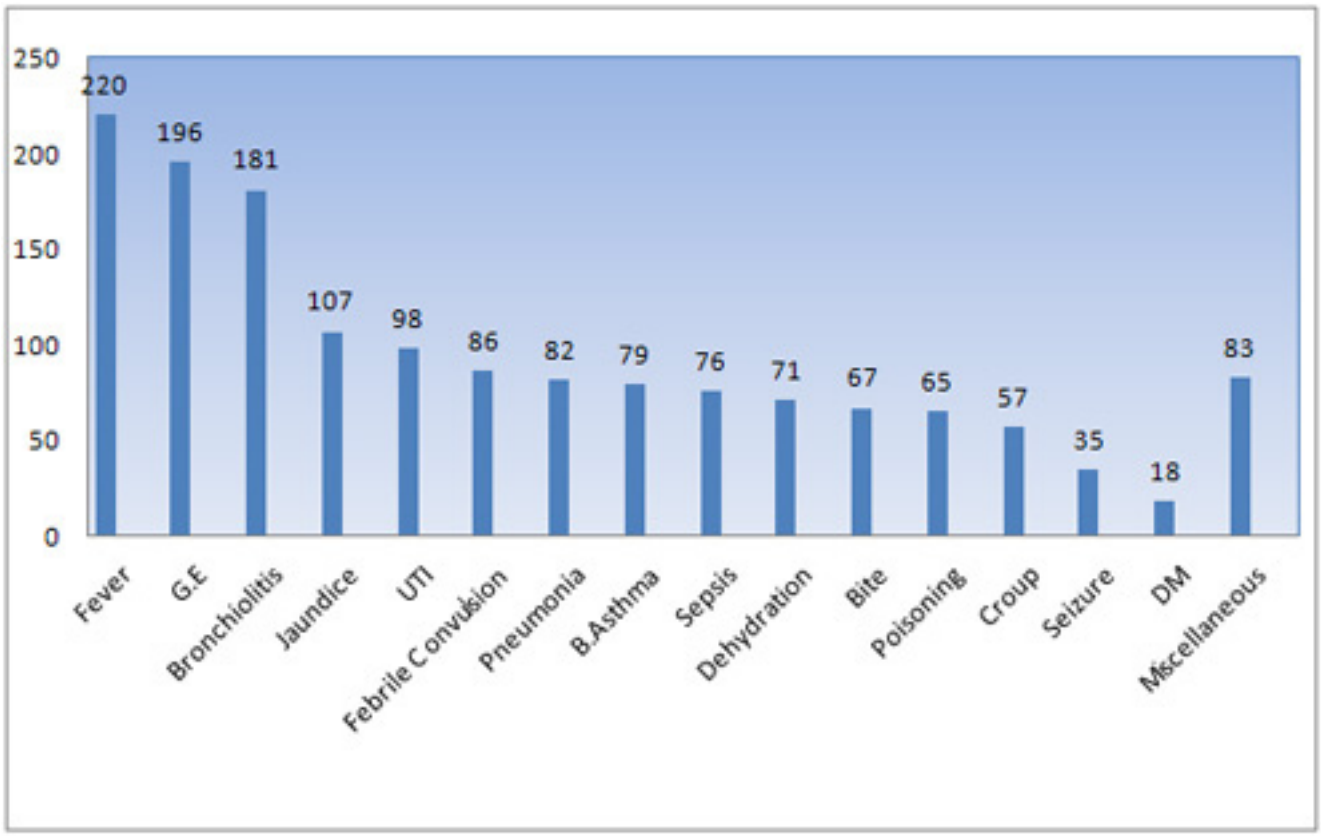


Chart 4: Number of patients and reason for hospitalization

Month	No. of admissions	Died	Days of hospitalization	Mean daily No. of admissions	Mortality Rate	Mean days of admission
Jan	198	1	499	16.10	0.005	2.52
Feb	188	0	463	16.54	0.000	3.07
Mar	249	2	799	28.54	0.008	3.20
Apr	227	2	615	18.03	0.009	2.62
May	189	0	516	16.13	0.000	2.63
June	179	0	558	6.90	0.000	2.94
July	195	0	436	13.52	0.000	2.28
Aug	192	0	396	10.71	0.000	1.93
Sep	187	0	539	11.58	0.000	2.91
Oct	159	1	485	12.13	0.006	2.98
Nov	172	0	377	12.57	0.000	2.34
Dec	165	2	426	14.20	0.012	2.54

Table 1: shows the admissions in every month and the average length of stay in the hospital and the deaths.

The most common cause for admission was fever (220), followed by gastroenteritis (196) and bronchiolitis (181) as shown in Chart 4. We had 8 deaths with a mortality rate of (0.5%). The number of patients transferred to the ICU was 28 (1.8%), and 230 patients (15%) were transferred to another hospital. March was the month with the most admissions with 249 admissions and October with the least admissions (159) as shown in Table (1). The mean duration for admission was 2,663 days. About 205 (13%) were discharged against medical advice. Admission duration varied from 1 to 16 days, mean duration of stay in hospital was 2.66 days.

Discussion

We reviewed morbidity and mortality pattern of children admitted in our pediatric ward to get a wide picture and to get a baseline of quality of care, and also to recognize our priority problems.

Conclusion

Unfortunately, there is a lack of information about hospital admissions in other countries to be compared to this study. Presumed serious infections were the commonest cause of admission among children. This reflects the fact that parents are always worried about their kid being febrile and doctors also keep in their mind the serious disease that could be behind the fever . The number of female patients was more than males, which can be due to a higher incidence of UTI in females as one can suspect. The age group of less than 2 years was the most common age of admission and the majority of them were younger than 1 year. Newborns contributed a relatively large proportion of admissions, this may be due to the significant number of babies admitted to the hospital as cases of neonatal jaundice, which is explained by the fact that we have an early discharge of neonates from our nursery (less than 24 hours) and the fact that in our NICU,we do not admitted outpatient newborns to the NICU.

MacFaul (8) published a study from the United Kingdom in which they reviewed 267 admissions to a district pediatric ward. There was a higher rate of admission as cases of asthma and croup which accounted for about 21% of their sample, against 8.9 % of ours and this may be due to industry in developed countries in comparisonto our region. In island Dominica, a review of 968 pediatric patients on the island, 49.3% had infectious diseases; these differences may be due to controlling of infectious diseases during the last few years by vaccination (9). In a review of the causes of admission and death among children admitted to a pediatric teaching hospital in Bamako, Mali, the reasons for hospitalization were: pneumonia (12%); sepsis (37 %); meningitis, (20 %); at least 64 % met World Health Organization criteria for severe malaria. Seventy-one per cent of admissions were due to infections(10) . In an Iranian study (11) the most common diseases were seizure disorder (11.1%), followed by pneumonia (7.7%), febrile convulsion (4.79%) and gastroenteritis (4.18%). The total mortality rate was 5.30%. Different studies carried out in developing countries have revealed a mortality rate ranging from 5 to 14% (12, 13, 14). These figures are higher compared to our study (0.5%), and this is because we usually transfer serious patients. Another study designed in Al-Ain, in the United Arab Emirates (15) showed that the transfer rate to another hospital was 1.4% versus 15% in our study. The large number of patients needing referral to another hospital may reflect the need for some subspecialty in our hospital and the lack of advanced radiological and laboratory investigations that help in diagnosis.

Conclusion

Fever is the leading cause for admission in our ward. This reflects the fact that parents are always worried about their baby being febrile and doctors also keep in mind the serious disease that could be behind the fever like sepsis, especially during infancy, or meningitis later on. The most common age of admission in pediatric wards was less than one year. The large number of patients needing referral to another hospital may be indicative of the need for some subspecialty in our hospital and the lack of advanced radiological and laboratory investigations that help in diagnosis. The need to initiate other studies may offer a wider picture for the child health care in this area.

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Primary Care Physicians' Knowledge, Attitude and Prescribing Practices for Acute Respiratory Tract Infections in Children Aged (2-59) Months in Ismailia Governorate

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Abstract

Background: Acute Respiratory Infections (ARI) are the main cause of morbidity worldwide. Physicians' knowledge of diagnostics and therapeutics can play a role in prescribing. WHO recommended drug use indicators to study prescription practices.

Aim: to assess primary care physicians' knowledge, attitude and prescribing practice for acute respiratory tract infections in children aged 2-59 months to improve the use of drugs within primary care settings.

Methods: This is a cross sectional descriptive analytic study that was conducted in primary health care centers in Ismailia city between July and December 2011. It included all primary care physicians. They responded to a validated anonymous questionnaire to collect data about characteristics of primary care physicians, their knowledge, attitude and their prescriptions for ARI cases.

SPSS. version 18 was used for data entry and analysis. Chi square/Fisher exact test were used for categorical variables. Student t test was used for continuous data. Statistically Significant difference was considered at P <0.05.

Results: Good knowledge and favorable attitude scores were found among 69.4% & 77.1% of physicians respectively. Inappropriate practices were indicated by most of drug use indicators. The average number of drugs per cases (optimal ≤ 2) was 1.91±0.89. Polypharmacy (optimal ≥ 3) was found in 22.9% of prescriptions. Cases with antibiotics prescribed were 74.7% (optimal 75%). The percentage of cases with injections was 28.5% (optimal 25%). The percentage of antibiotics prescribed for cold cases was 16% (optimal 0%). The percentage of drugs prescribed in generic names was 43% (optimal 100%). Only 15.6% of the studied prescriptions were according to IMCI guidelines.

Conclusion: Good knowledge and favorable attitudes were found especially among recently graduated primary care physicians for ARI in children aged 2-59 months while poor practice as indicated by most of the prescribing indicators could be a stimulus for further post-graduate educational intervention study and implementation of a periodical audit of drug prescribing in clinical practice.

Key words: Primary care physicians, ARI, IMCI, Prescription, Rational.

Introduction

Acute Respiratory Infections (ARI) are the main cause of morbidity worldwide, and pneumonia represents one of the main causes of death in children younger than the age of 5 years in developing countries.[1] World Health Organization (WHO) reported that 1.9 million children died from ARI in 2000, 70% of them in Africa and Southeast Asia. 62% of all deaths are attributable to ARI and when measles deaths are excluded the proportion falls to 24%. [2]

Data from the 2004 Egypt Service Provision Assessment (ESPA 2004) survey revealed that antibiotic treatment is appropriate for most of ARI according to Integrated Management of Childhood Illness (IMCI) guidelines. Antibiotics were prescribed for 94% of the children diagnosed with strep throat and for 87% of children diagnosed with a severe respiratory illness. In most cases (70%), prescribed medicines had to be purchased from outside the facility, thus reducing the likelihood that the child would be treated appropriately. Pre-referral medicines are available at one in ten facilities.[3]

The most frequent diagnoses leading to drug prescription generally, as well as to prescription of systemic antibiotics, were respiratory tract infections.[4] In Europe and the United States, the prevalence of antibiotic prescription rate was higher in preschoolers, with a peak between 72 and 90%.[5] Prescribing antibiotics for conditions with no proven benefit is not only harmful practice but also contributes to the development of antibiotic resistance. [6]

WHO recommended drug use indicators were used to study prescription practices. In 1985 WHO defined the rational use of drugs as patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community. Twelve core policies were elaborated to promote rational drug prescribing, including essential drug list, clinical guidelines, continuing in-service medical education and audit. [7]

Between 1999 and 2007, the Ministry of Health and Population in Egypt scaled up the IMCI strategy in 84% of public health facilities. [8] IMCI is currently implemented in 93% of health facilities.[9] IMCI case management training is an effective intervention to improve the rational use of antimicrobial drugs for sick children visiting first-level health facilities in low-income and middle-income countries.[10] Management practices for supporting quality curative care for sick children included records and staff development and supervision. Less than half of all facilities providing outpatient care for sick children (45%) have an up-to-date register. The efficiency of the physician is one of the main reasons for using the facility for the child's health services. [3]

Aim

- to assess primary care physicians' knowledge, attitude and prescribing practices for acute respiratory tract infections in children aged 2 - 59 months, to improve the use of drugs within primary care settings.

Methods

The study was a cross sectional descriptive study carried out between July and December 2011. It included all physicians (167) working in 57 primary health care centers and units affiliated to the Ministry of Health in Ismailia governorate.
A semi-structured questionnaire including 32 items was developed by the researcher and revised by the supervisors. A Pilot study was conducted on 10% of the study population (18 physicians were not included in the study sample) to test the relevancy of the questionnaire to the aim of the work and perform any modification needed. Validity and reliability of the questionnaire were tested. The questionnaire was distributed to the physicians in their work settings and it took 30 minutes to be handed to the researcher. The questionnaire was composed of four parts: Part I: to get physician's personal/work data including age, gender, certification, year of graduation, practice period in Primary Health Care Centers (PHCCs), practice location, the approximate number of children with ARI seen by the physician per week, his/her attendance of training courses, and their sources of updating knowledge.

Part II: Physician's knowledge regarding different ARIs; their diagnosis, etiology and appropriate treatment, were assessed using 15 multiple-choice questions; one point was given for each correct answer and knowledge scoring was satisfactory if $\geq$ 60% and unsatisfactory if < 60%. Part III: Physician's attitude regarding rational use of antibiotics in ARI was assessed using one multiple-choice question with 3 choices about the importance of antibiotics in treating ARI. Attitude was expressed as favorable for (yes/sometimes) or unfavorable for (yes to all or no) answers. Part IV: physician's practice regarding rational use of drugs in ARIs in children aged from 2 months up to 5 years was assessed by asking the physicians to write down prescriptions for four ARI clinical scenarios designed and classified according to the national guidelines IMCI 2008.[11] Cases no. 1, 3, & 4 that were previously classified as bacterial streptococcal sore throat, acute ear infection and pneumonia, were considered appropriate for antibiotics, while case no. 2 of cold or no pneumonia was considered non-appropriate for antibiotics. Case no.1 of streptococcal sore throat was the only case appropriate for antibiotic injection.

Practice assessment was based on the WHO/International Network for the Rational Use of Drugs (WHO/INRUD) prescribing indicators,[7,12,13] which were calculated from 576 prescriptions and optimal levels were calculated based on the number of expected drugs to be in prescriptions for cases based on IMCI guidelines as:

- Average number of drugs per case (optimal level: $\leq$ 2).
- Percentage of cases with antibiotic prescribed (optimal level: 75%).

• Percentage of cases with injections prescribed (optimal level ≤ 25%).
• Percentage of drugs prescribed by generic name (optimal level: 100%).

Other indicators used:

• Polypharmacy ≥ 3 drugs (optimal level: 0%)
• Percentage of cold cases with antibiotic prescribed (optimal level: 0%)
• Percentage of cases treated according to the IMCI guidelines (optimal level: 100%)
• Percentage of drugs prescribed from essential drug list was excluded as it was not available in most of the PHC centers and units under study as evident previously from the pilot study.

IMCI guided prescriptions means that the prescribed drugs were correct in name, dose and duration according to IMCI guidelines.

Ethical considerations:
The study was approved by the ethics committee of faculty of medicine, Suez Canal University and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. The questionnaire was anonymous, no critical questions and confidentiality of data were preserved.

Statistical analysis:
Data was collected and analyzed using Statistical Package for Social Sciences program (SPSS version.18). Results were represented in tables and graphs. Chi square test or Fisher exact were used for testing significance of categorical variables. Student t-test was used for testing significance of continuous variables. The level of significance was considered statistically significant if p value < 0.05 and high statistical significance if p value <0.001.

Results

Out of 167 physicians 144 returned their questionnaires with a response rate of 86.2%. Among the participating physicians, slightly more than half of them were females (56.3%). Near two thirds of the physicians (62.5%) were less than 30 years old with more than half of them (56.9%) recently graduated (≥ 2006) and hence a higher percentage of participants (61.1%) had less than 5-years' experience in the PHC work. Non-certified and certified physicians with diploma or master degree were equal. However, only about one quarter (27.1%) of them had received post-graduate training and about half of the participants (54.9%) were working in rural areas.

Knowledge
Satisfactory knowledge scores were found among more than two thirds (69.4%) of the physicians (Figure 1). The present study showed that there was a high statistically significant relation between the knowledge scores and working years less than 5 years (p<0.001). Also a statistically significant relation was found between the knowledge scores and both the year of graduation (p=0.002) and receiving postgraduate training courses (p=0.045). (Table 1)

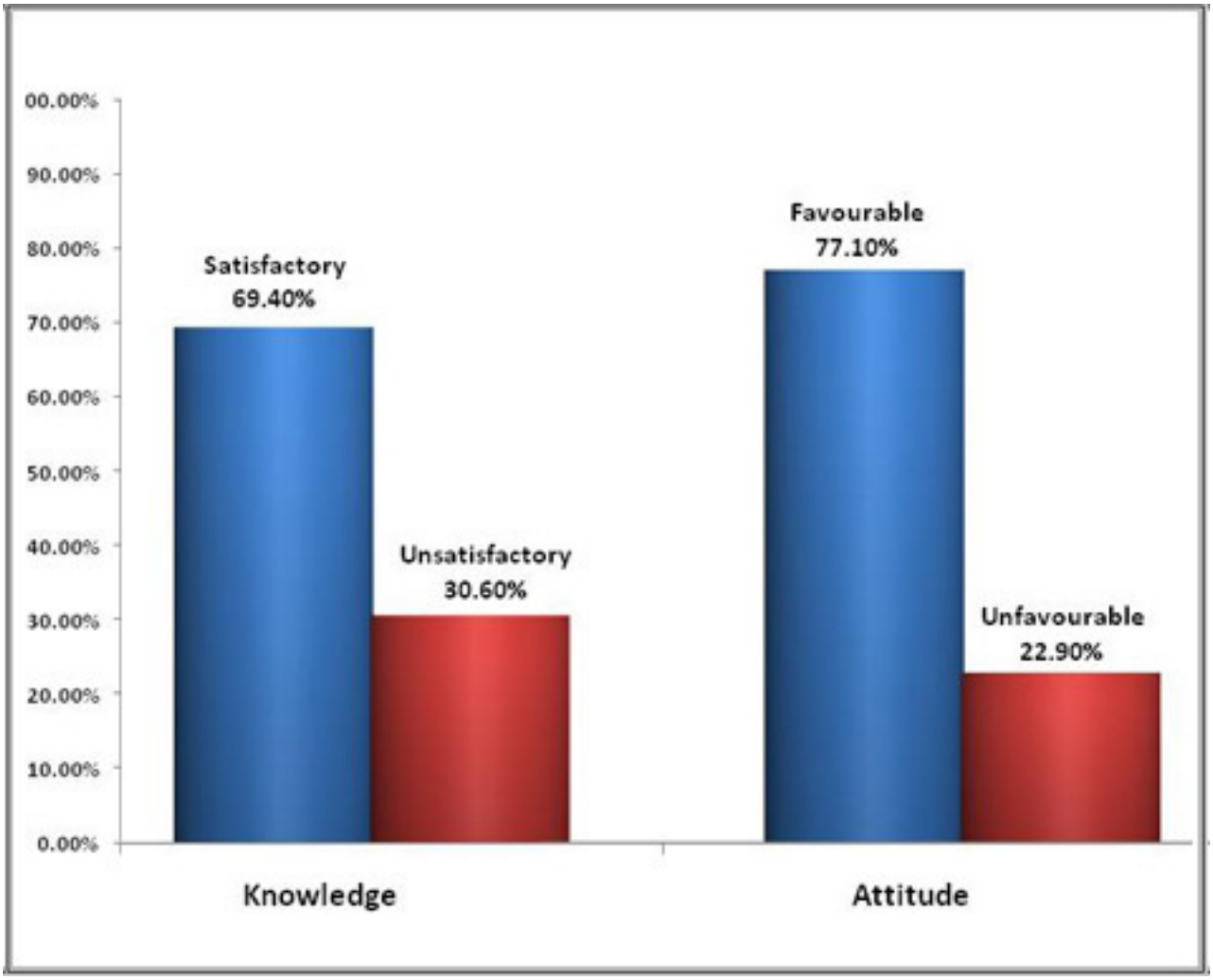
Attitude
A favorable attitude towards antibiotic prescription was found among most of the participating physicians (77.1%) (Figure 1). There was a high statistically significant relation between physicians' attitude and number of children with ARI seen per week (p<0.001). There was a statistically significant relation between physicians' attitude and each of age (p=0.002), year of graduation (p=0.016), years of working in the PHC (p=0.001) and receiving postgraduate training (p = 0.002). (Table 2)

Practice
There was a high statistically significant relation between prescribing according to IMCI guidelines with age, certification, year of graduation and years of working in PHC (p<0.001). Also there was a significant relation between prescribing according to IMCI guideline with gender (p=0.016); receiving training courses (p=0.015) and number of ARI cases seen per week (p=0.023). (Table 3)

The prescribed drugs were 1104 per 576 ARI prescriptions with a range from 1-4 drugs. Although the average number of drugs per prescription was optimal (1.91±0.89) polypharmacy ≥ 3 drugs was found in about a quarter of the ARI (22.9%) prescriptions. Although the percentage of antibiotics prescribed was nearly optimal (74.7%), the majority of antibiotics (84%) were non IMCI guided. The percentage of injections prescribed (28.5%) was higher than the optimal with 83.5% of injections non IMCI guided. The percentage of drugs in prescribed generic name was non-optimal (43%). The percentage of cold cases with antibiotics prescribed was 16% which represents irrational use of antibiotics and constituted about 5% of totally prescribed antibiotics. The majority of prescriptions were not according to IMCI national guidelines in management of ARI (84.5%).

In comparing IMCI guided prescriptions versus non IMCI guided prescriptions out of prescribed drugs 950/486 were not IMCI guided prescriptions vs. 154/90 IMCI guided prescriptions. The average number of drugs prescribed within IMCI guided prescriptions versus non IMCI guided prescriptions was (1.95±0.92 vs. 1.71±0.72) and this difference was statistically significant (P=0.018); the percentage of drugs in prescribed generic names was (85% vs. 36.2%) which was statistically significant (p <0.001). The polypharmacy was (25.9% vs. 0) and the percentage of prescribed antibiotic for cold cases was (16.7% vs. 0) and both were statistically significant (p <0.001). (Figures 2 and 3)

The most frequently prescribed antibiotic was amoxicillin and amoxicillin/clavulanate within 33.9% and 20.6% of prescriptions. The most frequently prescribed injections were benzathine penicillin (29.9%) and ceftriaxone which represented 19.5%. But benzathin penicillin injection was prescribed only in one third of streptrococcal sore throat cases (18.75%). Antibiotics were prescribed by 16% of physicians for cold which represented irrational use of drugs.



Above:
Figure 1: Primary care physicians' knowledge and attitude towards rational drug prescription for ARIs in children (2-59) months

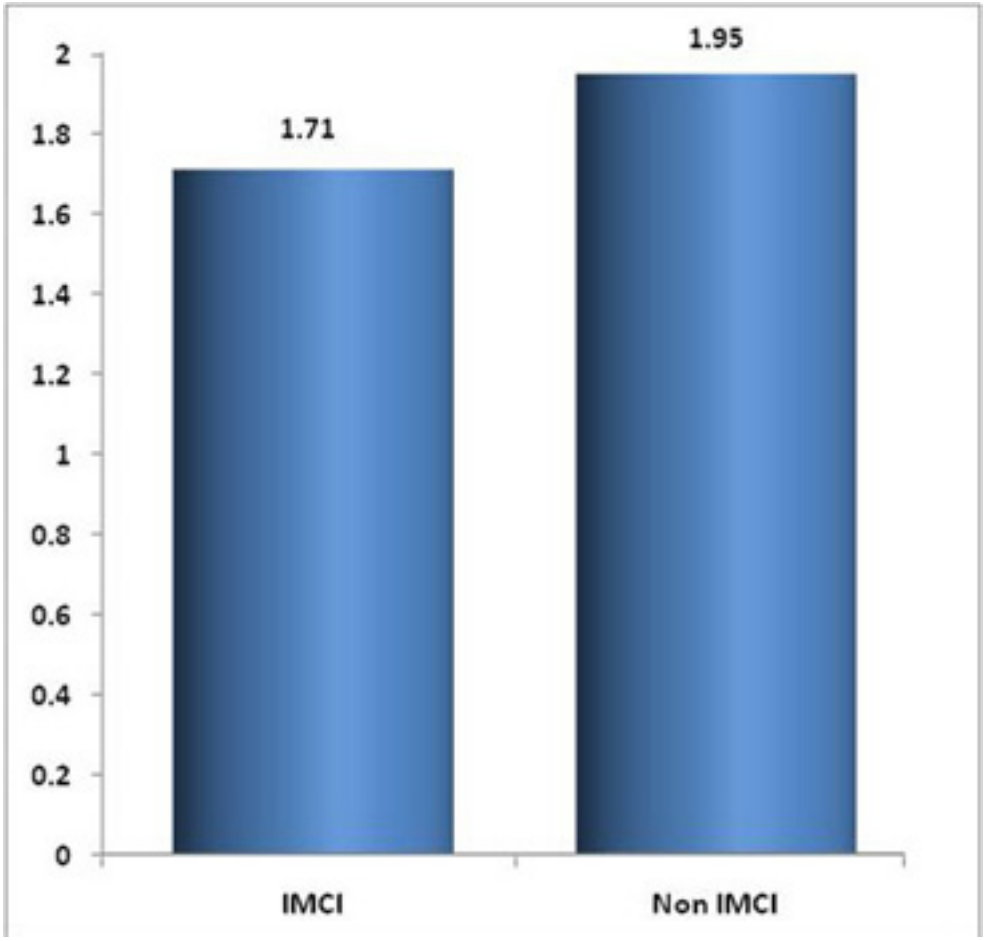
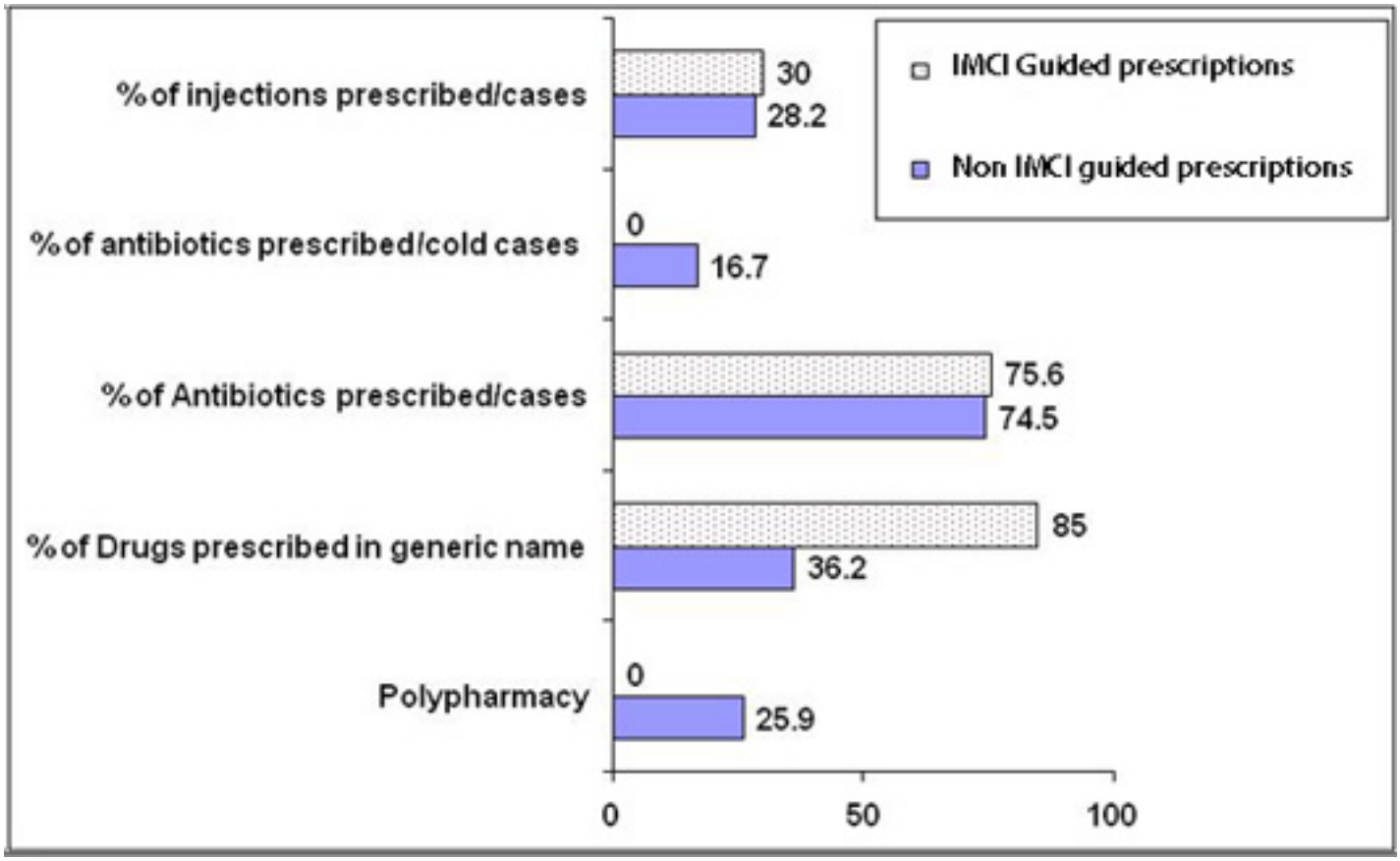


Figure 2: Difference between IMCI and Non IMCI guided prescriptions regarding the average number of drugs prescribed per ARI cases

Figure 3: Difference between IMCI and Non IMCI guided prescriptions regarding selected drug use indicators in ARI cases



Discussion

In the current study, it was found that, more than two thirds of the studied physicians (69.4%) had satisfactory knowledge scores about ARIs and their treatment. These results were better than the study by Al Gelban et al., 2009 [14], in Aseer region, Saudi Arabia among 268 primary care physicians in which most of them had good knowledge on ARIs. This difference could be related to the difference in their updated education, source of information and most probably difference in the tested knowledge within each study. The current study found that more than three quarters (77.1%) of the studied physicians had a favorable attitude regarding the importance of antibiotics in ARI. However, in Al Gelban et al., 2009[14] study, they found that physicians' attitude towards antibiotics that cure most cases of ARI among children was favorable in 62% of the studied physicians. This could be due to general questions about infection that were not specific for etiology as viral or bacterial.

The present study revealed that IMCI guided prescriptions represented only 15.6% of the studied prescriptions by primary care physicians. These results were congruent with WHO 2009[15] about medicines use as ARI cases treated according to clinical guidelines was below 50% in most studies in developing and transitional countries. These results were beyond the expected as IMCI is currently implemented in 93% of health facilities [9] but this could be related to the fact that not all of the participating physicians were trained to these guidelines or due to other factors impending their adherence to these guidelines as non convinced or not realizing their importance or depending on other international guidelines in management of ARI.

In comparing the physicians with satisfactory vs. those with unsatisfactory knowledge scores, physicians with favorable attitude vs. unfavorable attitude and their IMCI guided prescriptions vs non IMCI guided prescriptions, most of these results indicate better practice among recently graduated physicians and could be related to undergraduate training rather than postgraduate training of early graduated physicians. These results could be explained by early involvement of academia in adaptation and planning of the IMCI strategy which led to a strong commitment that was translated into strengthened curricula and inclusion of IMCI in teaching of paediatrics and community health. [8] These previous results were in disagreement with the reported results from Al Gelban et al., 2009 [14] study that physicians' characteristics had no relation to their knowledge, attitude and practice. This could be explained by the difference in education and culture between physicians and the methodology in each study.

The prescribed drugs were 1104 per 576 ARI prescriptions with a range from 1-4 drugs with optimal average number of prescribed drugs (1.91±0.89). These results are in agreement with other studies[16] and polypharmacy ≥ 3 drugs was detected among nearly a quarter (22.9%) of all prescriptions. It was

Table 1: Relation between personal/work characteristics and knowledge scores of the study sample (n=144)

Parameters	Knowledge scores				X^2	P. Value
	Unsatisfactory (n=44)		Satisfactory (n=100)			
	No.	%	No.	%		
Age: (Years)						
< 30	28	63.6	62	62.0	0.035	0.852
≥ 30	16	34.4	38	38.0		
Gender:						
Female	20	45.5	61	61.0	3.001	0.083
Male	24	54.5	39	30.0		
Certification:						
Not certified	17	38.6	55	55.0	3.27	0.07
Certified	27	61.4	45	45.0		
Year of graduation:						
≤ Year 2000	2	4.5	22	22.0	12.6	0.002 *
2001- 2005	19	43.2	19	19.0	Fisher	
≥ 2006	23	52.3	59	59.0	exact	
Working years in PHCCs:						
< 5	23	52.3	65	65.5	15.9	<0.001*
5 – 10	19	43.2	15	15.0	Fisher	
≥10	2	4.5	20	20.0	exact	
Practice location:						
Urban	15	34.1	50	50.0	3.12	0.077
Rural	29	65.9	50	50.0		
Receiving postgraduate Training courses:						
No	37	84.1	68	68.0	4.01	0.045*
Yes	7	15.9	32	32.0		
No. of children with ARI seen per week:						
< 20	28	63.6	52	51.0	1.37	0.242
≥ 20	16	36.4	49	49.0		

*Chi-square/fisher exact test is statistically significant if.(p-value<0.05) & high statistically significant.(p-value<0.001)

found that the overuse, underuse or misuse of medicines harms people and wastes resources.[17]

Improper antibiotic prescription contributes to the development of antibiotic resistance. [6] [17] The percentage of antibiotic prescribed/ cases was higher in the present study than many other studies as three quarters of the presented cases needed antibiotics while in the Spanish study by Bjerrum et al., 2006[18] that consisted of courses in management of ARI according to local clinical guidelines, and included implementation of rapid diagnostic tests in which the intervention led to a significant reduction in antibiotic prescribing from 36% to 24%. This could be related to a difference in need of antibiotic among the studied cases.

The percentage of cold cases with antibiotic prescribed was 16% which represents irrational use of antibiotics. These results are congruent with a Dutch study by Jansen et al 2006 [6] who revealed that antibiotics were inappropriately prescribed for preschool children in 12-15% of episodes of asthma exacerbation, acute laryngitis, influenza and in common cold. But the results fortunately were better than the results by Gwimile JJ et al 2012[19] , 68.9% of children aged from one month to 5 years with common cold were given antibiotics inappropriately. Also the study results were better than the other studies which found that almost half of patients with URTI receive antibiotics. [20] [21]

Table 2: Relation between personal/work characteristics and attitude of the study sample (n=144)

Parameters	Attitude				X^2	P. Value
	Unfavorable (n=33)		Favorable (n=111)			
	No	%	No	%		
Age: (Years)						
< 30	13	39.4	77	69.4	9.75	0.002*
≥ 30	20	60.6	34	30.6		
Gender:						
Female	15	45.5	66	59.5	2.03	0.154
Male	18	54.5	45	40.5		
Certification:						
Not certified	15	45.5	57	51.4	0.354	0.552
Certified	18	54.5	54	48.6		
Year of graduation:						
≤ Year 2000	5	15.2	19	17.1	8.27	0.016*
2001- 2005	15	45.5	23	20.7		
≥ 2006	13	39.4	69	62.2		
Working years in PHCCs:	14	42.4	74	66.7	14.74 Fisher exact	0.001*
< 5	16	48.5	18	16.2		
5 – 10	3	9.1	19	17.1		
≥10						
Practice location:						
Urban	14	42.2	51	45.9	0.127	0.721
Rural	19	57.6	60	54.1		
Receiving postgraduate Training courses:						
No	31	93.9	74	66.7	9.58 Fisher exact	0.002*
Yes	2	6.1	37	33.3		
No. of children with ARI seen per week:						
< 20	31	93.9	48	43.2	24.39 Fisher exact	< 0.001*
≥ 20	2	6.1	63	56.8		

*Chi-square/fisher exact test is statistically significant if.(p-value<0.05) & high statistically significant.(p-value<0.001)

The present study found more than the optimal level of injections prescribed/cases (25.8%). ESPA 2004 found that antibiotics were prescribed for 94 % with 26 % receiving an injectable antibiotic. The injection in this study was only needed in case of streptococcal sore throat. Use of injections always linked to blood borne infections but the use of new sterilized syringes and needles for injections is universal and sharps boxes were available from providers of therapeutic injections (60 %).[3] The irrational use of injections could be explained by the fact that 83.5% of the total injections prescribed were non IMCI guided and could be used in other ARI cases.

The prescription in generic names was far from optimal (43%) and this could be related to non availability of essential drugs list in most of the centers and a low percentage of training of postgraduate physicians.

In comparing IMCI guided prescriptions versus non IMCI guided, the average number of prescribed drugs was lower in IMCI than non IMCI guided prescriptions (1.71±0.72 vs. 1.95±0.92) which was statistically significant (P<0.001). Also this difference could reflect the polypharmacy which was found (25.9%) in non IMCI prescriptions versus 0% in IMCI guided prescriptions.

Table 3: Relation between personal / work characteristics of studied population and treating cases according to IMCI guidelines (INRUD-WHO criteria) in 576 prescriptions

Parameters	Treating cases according to IMCI protocols (N=576 cases)					
	Not IMCI guided prescriptions n = 486		IMCI guided prescriptions n = 90		X^2	P
	No.	%	No.	%		
Age: (Years)						
< 30	290	59.7	70	77.8	10.62	0.001 *
≥ 30	196	40.3	20	22.2		
Gender:						
Female	263	54.1	61	67.8	5.76	0.016 *
Male	223	45.9	29	32.2		
Certification:						
Not certified	223	45.9	65	72.2	21.07	< 0.001*
Certified	263	54.1	25	27.8		
Year of graduation:						
≤ Year 2000	81	16.7	15	16.7	25.67	< 0.001*
2001- 2005	147	30.2	5	5.6		
≥ 2006	258	53.1	70	77.8		
Years in PHCCs:						
< 5	280	57.6	72	80.0	24.94	< 0.001*
5 – 10	133	27.4	3	3.3		
≥10	73	15.0	15	16.7		
Practice location:						
Urban	223	45.9	37	41.1	0.699	0.403
Rural	263	54.1	53	58.9		
Training courses:						
No	345	71.0	75	83.3	5.86	0.015 *
Yes	141	29.0	15	16.7		
ARI cases/week:						
< 20	277	57.0	39	43.3	5.186	0.023 *
≥ 20	209	43.0	51	56.7		

*Chi-square/fisher exact test is statistically significant if.(p-value<0.05) & high statistically significant.(p-value<0.001)

The present results were not as good as the Egyptian study by El Mahalli and Akl 2011[16] in Alexandria that revealed better drug use indicators in a clinic adopting IMCI guidelines than the other one not adopting IMCI and this difference was statistically significant. Average number of drugs/ encounter was lower in IMCI clinic than non-IMCI clinic (0.93± 0.2 vs 1.37 ± 0.6). The difference between the two studies could be related to the different method of selecting prescriptions and in the present studies the case scenarios that were studied only related to ARIs and only with the difference in the optimal levels.

In comparing the percentage of cold cases with antibiotics prescribed in non-IMCI versus IMCI guided prescriptions, these were (16.7% vs 0) and the results also reflect the adherence to guidelines in IMCI guidelines that avoid irrational drug prescriptions. Also this explanation could be supported by the Russian study of Jaruseviciene et al., 2013[22] that found lack of guidelines for the treatment of URTI was among the factors of non-clinically grounded antibiotic prescription.

In the present study the difference in the percentage of drugs prescribed in generic names was also statistically significant with (85% vs 36.2%) in IMCI vs non IMCI guided prescriptions. These results were to some extent in agreement in regard to guidelines with a study by Chopra et al., 2005[23] in Cape Town to measure the change in quality of care provided to sick children by nurses as

a result of the routine implementation of the IMCI intervention. Before and after IMCI intervention in four health districts, rational prescribing was improved (62% versus 84%). Although this study was not comparable to the present study in its methodology it showed the importance of using guidelines for improvement of rational prescription.

The present study showed that the most frequent antibiotic prescribed was amoxicillin and amoxicillin/clavulanate within 33.9% and 20.6% of prescriptions. The most frequently prescribed injections were benzathine penicillin (29.9%) and ceftriaxone which represented 19.5%. This was to some extent in agreement with the study by Mohan et al., 2004[24]. Amoxicillin alone or with clavulanate was the most frequently prescribed antibiotic for all URTIs.

But benzathin penicillin injection was prescribed only in one third of streptrococcal sore throat cases (34%). This could be explained by the fact that other guidelines didn't indicate benzathin penicillin injection as the drug of choice. Penicillin could be prescribed in oral form as by the European Society for Clinical Microbiology and Infectious Diseases that established the Sore Throat Guideline Group to write an updated guideline to diagnose and treat patients with acute sore throat.[25] Also Regoli et al., 2011[26] mentioned the other oral options which explain the low injection prescription to streptococcal sore throat as oral amoxicillin can be a suitable option as it is accepted and, due to its better palatability. Cephalosporins can be a choice in case of allergy to penicillin, or macrolides should be reserved for the rare cases of proven allergy to β-lactams. [26]

Conclusion

There was good knowledge and favourable attitude among the participating primary care physicians towards drug prescriptions for ARI in children aged (2-59) months with far from optimal prescribing among most of them. Knowledge, attitude and following IMCI in management of ARI in children were mostly better among recently graduated physicians. These results could be a stimulus to further postgraduate educational intervention study and implementation of periodical audit of drug prescribing in clinical practice is required to rationalize the prescribing practices. Limitations of the study: Many factors could limit the generalization of the study results, as drug prescribing indicators were designed for use in primary care facilities, dispensaries or hospital outpatient departments. On studying factors that could affect knowledge, attitude and practice of physicians, the present study focused on personal characteristics of physicians. Attitude didn't address the convenience or barriers related to the use of national guidelines.

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Maternal anemia status among pregnant women in Erbil city, Iraq

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Abstract

Background: Anemia is the most common medical disorder of pregnancy. The current study aimed to find out the prevalence of anemia and its association with socioeconomic and obstetric characters among pregnant women in Erbil city.

Methods: A descriptive cross sectional study was conducted from August 2011 to February 2012. The data was collected by a direct interview from pregnant women in their 3rd trimester attending primary health care centers; the hemoglobin level of <11 gm/dl was considered anemic.

Results: The total sample size was 400 pregnant women; their ages ranged from 15 to 44 years (mean ± standard deviation of 26.68 ± 5.917 years). The overall prevalence of anemia was 55.5%, with highest rate among the age group of < 20 years and ≥ 40 years.

Overcrowding index, poor dietary habit, multiparity, low consumption of iron-folate supplements, the absence of specialist doctor and monthly screening for anemia were significantly associated with prevalence of anemia.

Conclusion: There is a high prevalence of anemia among pregnant women in Erbil city, all the cases are of mild and moderate severity which is associated with many factors like over crowding, poor dietary habit, gravidity, lack of qualified staff, shortage of iron-folate supplements and poor counseling.

Key words: Maternal anemia, pregnant women, Erbil

Introduction

Anemia is the decreased ability of the red blood cells to provide adequate oxygen to body tissues. It may be due to a decreased number of red blood cells, a decreased amount of substance in red blood cells which transport oxygen (hemoglobin) or a decreased volume of red blood cells below a normal range for age and gender [1]. Nearly half of the pregnant women in the world are estimated to be anemic: 52% in non-industrialized - as compared with 23% in industrialized - countries [2]. Anemia is ranked as the fourth commonest cause of maternal mortality after abortion, hemorrhage and hypertension/eclampsia [3]. The World Health Organization (WHO) recommendation for the lower limit of the normal range of hemoglobin concentration (Hb) in pregnancy is 11 g/dl. Therefore any hemoglobin level below 11gm in pregnancy should be considered as anemia [4]. The pregnant woman is particularly at risk of becoming anemic, due to high iron needs because of increased blood volume and the growth of the fetus, placenta and other maternal tissues [5]. Anemia in pregnancy is most commonly due to low levels of essential precursors as iron and folate, less commonly it may be due to chronic blood loss or hemolysis [6]. Iron deficiency anemia is a serious public health problem affecting more than 700 million people in the world with 110,000 annual maternal deaths attributable to iron deficiency anemia [7,8]. The basic approaches to the prevention of Iron deficiency anemia are; dietary changes and diversification to increase iron intake and supplementation with medical therapy [9].

Anemia, particularly iron deficiency anemia, is the most common hematological disorder during pregnancy [10]. Nutritional anemia results in impaired cognitive performance at all stages of life,

significant reduction of physical work capacity and productivity [1]. Fetal or neonatal complications include prematurity, low birth weight, poor Apgar score, fetal distress, and neonatal distress requiring prolonged resuscitation and causing neonatal anemia due to poor reserve. Infants with anemia have higher prevalence of failure to thrive, poor intellectual developmental milestones, and higher rates of morbidities and neonatal mortalities than infants without anemia [11]. Up to the researchers' knowledge there is no published study about prevalence of anemia among pregnant women in Erbil city other than a study conducted in 2004 about iron deficiency anemia in reproductive females revealed prevalence rate of 59% anemia among pregnant women [12] and since prevalence of anemia is high in pregnant women in the majority of developing countries [2] , this was a reason to conduct this study to focus on the frequency of anemia among this group and its association with other socio-demographic factors.

Materials and Methods

Population & data collection: This study was carried out at primary health care centers "PHCC" in Erbil city. Erbil city is the capital and the largest city of Iraqi Kurdistan region, with around one million habitants. A descriptive cross-sectional study design was used, which extended from 1st August 2011 through to 1st February 2012. A multi stage systematic random sampling was applied to select the study population. Sample size was determined using a confidence level of 95% with 10% degree of precision of the expected proportion and an estimated prevalence of 59% [12]. A sample of 400 cases was selected. The data was collected by a direct interview of pregnant women at their 3rd trimester who attended the PHCCs in Erbil, through a special designed questionnaire in addition to data from antenatal cards. The purpose of the study was carefully explained to each participant. A questionnaire was used with closed-ended questions covering the socio-demographic data of the participants and the obstetric and reproductive characters of the study sample. Haematocrit or packed cell volume (PCV) is a commonly performed lab assessment frequently used in screening of anemia because of its simplicity and the widespread availability of the necessary equipment [2]. Any pregnant women with hemoglobin level of <11 gm/dl are considered to be anemic [4].

Instruments: Anemia is classified according to severity into three categories: Mild (Hb level between 10 - 10.9 gm/dl), Moderate (Hb level between 7 gm/dl - 9.9 gm/dl) and Severe (Hb level less than 7 gm/dl) [13]. The Crowding index is calculated through dividing total number of family members by number of rooms (excluding the kitchen and bathroom) and accordingly categorized to three groups: Group 1: $\leq$ 2 members per room, Group 2: 3-4 members per room, Group 3: > 4 members per room [5]. Dietary habit is categorised to three groups [14]: Poor: (those eating meat, eggs or poultry less than twice per week), satisfactory: (those eating meat, eggs or poultry 2-3 times per week), good: (those eating meat, eggs or poultry daily). The study protocol was approved by scientific and ethics committee of the college of medicine of Hawler Medical University and a verbal consent was obtained from all women prior to participation in the study.

Data analysis: Statistical Package for Social Sciences (SPSS), Version 18 was used for the purpose of data entry and data analysis. Chi-square test was used to compare the association between the categorical variables. P value of $\leq$0.05 was considered statistically significant.

Results

In the current study 400 pregnant women participated, their Hb levels ranged from 7.92 gm/dl to 13.60 gm/dl. The mean ± standard-deviation of Hb level for the entire studied sample was 10.6 ± 1.02 gm/dl. The overall prevalence of anemia was 55.5%. The prevalence of mild and moderate anemia was 20.8%, 34.8% respectively. The study sample's age ranged from 15 to 44 years (mean ± standard deviation 26.68 ± 5.917 years). Table 1 shows that the highest prevalence rate of anemia was among the age group of <20 years and > 40 years (64.71%, 76.92% respectively), while the lowest rate was (52.89%) among the age group of (20-29) years, (p=0.235). The prevalence rate of anemia was highest among illiterate pregnant women (63.95%) while the lowest (49.44%) was among those graduated from institutes and universities, (p=0.396). The prevalence rate of anemia (46.91%) was among those pregnant women who were employed, while (57.68%) among those who were not employed, (p=0.82). Low prevalence rate of anemia (41.8%) was observed among the women living in houses with low crowding index, while high prevalence rate (78.85%) was seen among those living in houses with high crowding index (p=0.001). The prevalence rate of anemia was higher among those pregnant women with poor dietary habits (88.4 %) while it was lower among those women with good dietary habits (34.2%) (p=0.001).

Table 2 shows that the highest prevalence rate of anemia was among those women who had $\geq$ 5 pregnancies (67.35%), while the lowest level was (49.17%) among those women who had 2-4 pregnancies, (p=0.039). The prevalence rate of anemia was lower among those pregnant women who were consuming iron-folate supplements (37.95%) than those who were not consuming these supplements (77.84%) (p=0.001). High prevalence rate of anemia (60.87%) was among those pregnant women who were registered at first trimester in ANC unit, while the prevalence rate of anemia was (55.45%) among those who were registered in second trimester (p=0.485). The study showed that the higher rate of anemia was observed among those women attending health centers without specialist doctor (60%) while lower prevalence rate of anemia (48.8%) was observed among those women attending

Characteristics		Anemic		Non anemic		Total		P
		No	%	No	%	No	%	
Age (years)	<20	22	64.71	12	35.29	34	(8.50)	0.235
	20 ~ 29	128	52.89	114	47.11	242	(60.0)	
	30 ~ 39	62	55.86	49	44.14	111	(27.8)	
	≥40	10	76.92	3	23.08	13	(3.30)	
Education (women)	Illiterate	55	63.95	31	36.05	86	(21.5)	0.396
	Read and write	16	57.14	12	42.86	28	(7.00)	
	Primary	58	53.21	51	46.79	109	(27.2)	
	Secondary& preparatory	49	55.68	39	44.56	88	(22.2)	
	Institutes and University	44	49.44	45	50.56	89	(22.0)	
Occupation	Housewife	184	57.68	135	42.32	319	(79.8)	0.82
	Employed	38	46.91	43	53.09	81	(20.2)	
Crowding Index	≤2	79	41.8	110	58.20	189	(47.3)	0.001
	3-4	102	64.15	57	35.85	159	(39.8)	
	>4	41	78.85	11	21.15	52	(13.0)	
Dietary Habit	Poor	62	88.5	8	11.5	70	(17.5)	0.001
	Satisfactory	85	76.6	26	23.4	111	(27.7)	
	Good	75	34.2	144	65.8	219	(54.8)	

Table 1: Association of anemia with certain socio-demographic characters of the study sample

Characteristics		Anemic		Non anemic		Total	
		No.	%	No.	%	No.	(%)
Gravidity $X^2 = 6.48$ P value =0.039	1	100	58.82	70	41.18	170	(42.5)
	2-4	89	49.17	92	50.83	181	(45.3)
	≥ 5	33	67.35	16	32.65	49	(12.3)
Regular Iron supplement consumption $X^2 = 63.51$ P value = 0.001	Yes	85	37.95	139	62.05	224	(56.0)
	No	137	77.84	39	22.16	176	(44.0)
Iron from Private sector $X^2 = 24.21$ P value =0.001	Yes	30	33	61	67	91	(22.7)
	No	192	62.1	117	37.9	309	(77.2)
Gestational age at first visit to ANC center $X^2 = 1.445$ P value =0.485	≤3 months (1st trimester)	28	60.87	18	39.13	46	(11.5)
	4 - 6 Months (2nd trimester)	183	55.45	147	44.55	330	(82.5)
	≥7 Months (3rd trimester)	11	45.83	13	54.17	24	(6.00)

Table 2: Association of anemia with obstetric characteristics of the sample

Assessment		Anemic		Non Anemic		Total
		No	(%)	No	(%)	
Presence of specialist $X^2 = 4.92$ P value = 0.027	Yes No	78 144	(48.8) (60.0)	82 96	(51.2) (40.0)	160 240
Monthly Hb measurement $X^2 = 4.464$ P value = 0.03	Yes No	36 186	(45.0) (58.1)	44 134	(55.0) (41.9)	80 320
Availability of Iron-folate tablet X2 = 4.137 P value = 0.042	Yes No	86 136	(49.7) (59.9)	87 91	(50.3) (40.1)	173 227
Clinical examination $X^2 = 1.25$ P value = 0.263	Yes No	152 70	(53.7) (59.8)	131 47	(46.3) (40.2)	283 117

Table 3: Association between prevalence and management of anemia

Assessment		Anemic		Non Anemic		Total	
		No	(%)	No	(%)	No	(%)
Counseling about hazard of anemia on the mother and the fetus $X^2 = 0.054$ P value =0.816	Yes No	15 207	(57.7) (55.3)	11 167	(42.3) (44.7)	26 374	(6.50) (93.5)
Counseling about appropriate diet during pregnancy $X^2 = 0.03$ P value =0.862	Yes No	149 73	(55.8) (54.9)	118 60	(44.2) (45.1)	267 133	(66.7) (32.2)
Advice about diet limit absorption of iron $X^2 = 0.079$ P value =0.779	Yes No	23 199	(53.5) (55.7)	20 158	(46.5) (44.3)	43 357	(10.7) (89.2)

Table 4: Counseling of pregnant women with certain topics related to anemia

Variables		B	P Value	OR	Lower bound	Upper bound
Absence of specialist		0.739	0.007	2.094	1.223	3.586
No monthly Hb checkup		0.015	0.966	0.985	0.479	2.023
Non availability of Iron		0.338	0.22	1.402	0.817	2.408
Crowding Index	≤2	0.933	.001	2.542	1.439	4.492
	3-4 (Ref)					
	> 4	1.648	.001	5.197	2.268	11.907
Gravidity	1	0.306	.365	1.538	.788	2.343
	2-4 (Ref)	0.456	.273	1.578	.698	3.567
	≥5					
No consume iron tablets		2.048	0.001	7.754	4.538	13.248

Ref = Reference

Table 5: Logistic regression analysis of anemia and several covariates among pregnant women

health centers run by specialist doctor (P=0.027). Lower rate of anemia was observed among those pregnant women with monthly Hb level measurement (45%), while higher rate of anemia (58.1%) was observed among those who were not checked for anemia by monthly Hb measurement (P=0.03). Crowding Index, use of iron tablets, adding iron from private sector and absence of specialist doctor in the primary health care center showed statistically significant association with anemia using logistic regression analysis (p value 0.001, 0.001, 0.001 .0.001, 0.007 respectively) as shown in Table 5.

Discussion

Anemia in pregnant women constitutes a real concern all over the world with more in developing countries. According to WHO, prevalence of anemia that exceeds 40% in any population is an indicator of a public health problem [2]. In the current study prevalence of anemia among pregnant women is 55.5% which is consistent with the result of other studies conducted in Erbil city in 2004 among reproductive age group females (59%) [12]; in Baghdad in 1997 was (51%) [15], in Jordan (50-65%) in 1990[16], in Pakistan (55.2%)[14] and in West Africa (50%)[2]. While it is more than what was reported in Sulaimaniya (Iraq) in 2003 (31%)[5], UAE (14%)[12], Iran (12.4%)[10], Kuwait (39.7%)[17], Malaysia (35%)[18], Indonesia (46%)[19], Latin America (40%)[2], in European countries (6-30%): Holland (28%), UK (6%) and France (9%)[21]. At the same time the current rate is lower than that reported in many under developing countries like India (84.9%)[20], rural Zaire (76%) and Kenya (75.6%)[13].

This high prevalence rate may be attributed to general low socio economic factors including education level, occupation, income, overcrowding, unhealthy diet habits and asymptomatic pattern of mild to moderate anemia. At the same time from another aspect it may be attributed to the quality of health services provided to pregnant women in PHCCs in the city, which was evident in all the PHCCs included in the study like: High number of daily visitors disproportionate with the number of doctors and nurses in each PHCC, lack of education programs like group or individual meetings, posters, leaflets and lack of drugs available to overcome anemia among pregnant women, and poor counseling of the pregnant women about the result of the examination and issues related to anemia[3]. Regarding the severity of anemia in pregnant women the percentage of mild and moderate recorded in this study was (20.8%, 34.8%) respectively, which is consistent with another study done in Pakistan[14], meanwhile it is inconsistent with other studies conducted in Sulaimaniya which revealed (18.82%, 11.42%) rates of mild and moderate anemia respectively[5]. In Erbil the rate was (33.4% , 23.4% , 2.2%) for mild, moderate and severe[12], also in Malaysia and Indonesia the majority of cases were of mild type[18,19]. Another study done in South Africa revealed high rates of severe anemia[20]; this may be a signal that the problem has a burden on a high number of pregnant women and the way of managing anemic persons might be inadequate.

This study showed a higher prevalence of anemia among those whose ages were < 20 years and ≥ 40 years, and this is agreeable with the result of other studies in Erbil[12], Malaysia[18], Indonesia[19], however it is inconsistent with that reported in Addis Ababa[21]. This may be due to lack of information and knowledge among those young adults and adolescents about their health status regarding anemia, and poor screening programs and later on management at premarital centers, since teenage pregnancy will cause depletion of body iron stores, as the nutritional status of teenagers is not ready to cope with demands of rapid growth of their bodies beside the demands required by pregnancy itself [12]. Regarding those women ≥ 40 years, the high rates maybe attributed to multiparity, with iron stores being depleted and exhausted due to frequent and close interval pregnancies and deliveries[17,14] in addition it may be attributed to bad management of anemia in PHCCs.

The current study showed that anemia during pregnancy in Erbil society is the problem of all educational levels without exception, although higher prevalence was observed among those with low levels of education, the difference was not significant statistically, this finding agrees with other studies[5,12,14,20,21], while disagreeing with that recorded in Malaysia[18] and Indonesia[19]. This may be a signal that the majority of people in the city are under estimating the risk of anemia, and knowledge about its normal value is lacking even among the high education level of society. Absence of association of occupation with the rate of anemia in the current study is in concordance with other studies[5,12,14,20,21]. This may be contributed to the lack of knowledge about anemia irrespective of their occupation. The finding that anemia is more prevalent among those with higher crowding index in the current study is consistent with that recorded in Erbil[12], Sulaimaniya[5]and Addis Ababa[21]. This may be attributed to the economic factors notably the income, since the anemia to be prevented and well managed needs in addition to medicines, foods rich in iron content which may be expensive and not easy to obtain in sufficient amounts. High prevalence of anemia was observed among those pregnant women who had poor dietary habit which agrees with other studies [5,12,14,21]. The explanation for that may be one of the major contributory factors in developing countries for development of anemia is consumption of plant based foods containing insufficient iron in accordance with body needs especially during pregnancy; also lack of iron absorption enhancer in the meals like vitamin C, and drinking of iron absorption inhibitor drinks like tea immediately after meal [21].

The current study result is consistent with the study done in Sulaimaniya[5], Pakistan[14], Malaysia[18], South Africa[20] and

Addis Ababa[21], which showed that women with a higher number of conceptions have increased prevalence of anemia. However this finding disagrees with the study done in Erbil [12]. The reason for that may be due to the fact that pregnancy has a negative effect on iron stores especially when iron intake is compromised. A woman whose gravidity is more than six is twice as likely to become anemic as a woman whose gravidity is from one to three [19]. The finding that the prevalence of anemia is higher among those women who were not consuming iron tablets than those who were consuming in study population is consistent with other studies from Pakistan[14], Malaysia[18] and Addis Ababa[21]. This reflects the necessity of Iron-folate supplements during pregnancy as WHO recommends that all pregnant women should be supplemented with 60 mg of iron daily, in a pill that also usually contains 400 µg folic-acid [2]. An additional benefit of iron supplementation during pregnancy is the opportunity to improve the maternal iron stores during the postpartum period, and this can reduce the risk of development of anemia during lactation and subsequent pregnancy.

The study showed that there is no statistically significant difference in the prevalence of anemia between those who were registered in ANC units at the first, second or third trimesters, which is inconsistent with another study done in Erbil, which showed a pattern of late registration[22]. Early registration was found to have no effect on improving the status of Hb level, which disagrees with a study done in Nablus which showed a clear association between early registration and iron deficiency anemia; early registration is associated with low prevalence rate of anemia.[17]. This situation might draw the attention to the role and effectiveness of the ANC services. The explanation for that may be attributed to many factors like the amount of Iron-folate supplements are not enough to overcome anemia, poor compliance with iron supplementation, the follow up is inadequate in subsequent visits, the counseling program is poor and the cooperation of the pregnant women is inadequate. These reasons are serious signals to study, each one separately, and to treat the obstacles in improvement of Hb level among pregnant women attending ANC units, since the first antenatal visit should be initiated as soon as the pregnancy is diagnosed (in the first trimester) which facilitates early diagnosis of anemia and allows the treatment program to correct anemia before delivery.

The study found that presence of family physician or obstetrician in ANC unit affects significantly the prevalence rate of anemia agreeable with that found in another study done in Burkina Faso[23]. This may be explained by the lack of qualified staff, and poor management of existing staff accounts for the unsatisfactory provision of ANC, resulting in poor management of anemia among pregnant women. The current study revealed that ANC units seems to play a very limited educational role regarding anemia which is consistent with the findings of studies done in Erbil[22] and Nablus[17]. This defect in counseling of anemic pregnant women may be due to; poor performance of the trained staff in ANC units, or unavailability of educational program, or overcrowding in these units making counseling difficult.

Logistic regression analysis revealed that there is a significant association between crowding index, consumption of iron, presence of specialist, getting iron from private sector, with prevalence of anemia which indicates the lower chance of confounding effects of other variables on prevalence of anemia.

Conclusion

High prevalence of anemia among pregnant women in forms of mild and moderate severity is more prevalent among teenage mothers and among those whose ages are ≥ 40 years. Anemia is associated with many factors like over crowding, poor dietary habit, gravidity, lack of qualified staff, shortage of iron-folate supplements and poor counseling.

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Prevalence of obesity in secondary schools females in Al-Karkh side of Baghdad city

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Abstract

Background: Obesity is a state of excess adipose tissue mass. Body mass index (BMI), a measurement which compares weight and height, defines people as overweight (pre-obese) if their BMI is between 25 and 30 kg/m2, and obese when it is greater than 30 kg/m2.

Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis. It is most commonly caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications or psychiatric illness.

Aim: To throw light on overweight and obesity prevalence in secondary school female students in Baghdad city.

Subjects and methods: A cross sectional study conducted in a sample of secondary schools in Al Karkh side of Baghdad city from March the 1st through to May 2012. A sample of 2690 female students aged 15-23 years were enrolled in the study from 18 secondary schools taking into consideration inclusion and exclusion criteria. Weight and height were measured using digital scale and microtoise respectively, thereafter the body mass index was calculated using the formula: weight (kg)/Height (m2). The students were classified as obese, overweight, normal and underweight according to international cut off points BMI charts matched for their ages.

Results: The study involved 2690 female students; their ages between 15-23 years. Obesity was 9%, overweight occurred in 24%, morbid obesity was only 0.9%. Underweight was at 8% in these girls.

Conclusion: The study showed a high prevalence of overweight and obesity, among secondary female students. The overweight was the highest among the countries of the Arabian Gulf while obesity was comparable with the neighbouring countries.

Key words: obesity, secondary school females, Baghdad.

Introduction

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems.(1)

Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity.(2)

Obesity is a leading preventable cause of death worldwide, with increasing prevalence in adults and children, and authorities view it as one of the most serious public health problems of the 21st century.(3)

Obesity is stigmatized in much of the modern world (particularly in the Western world), though it was widely perceived as a symbol of wealth and fertility at other times in history, and still is in some parts of the world. (4)

Data from the National Health and Nutritional Examination Survey (NHANES) provide compelling evidence that there has been a marked increase in obesity over the past 30 years. The prevalence of being overweight (95th percentile body mass index for age) has increased 4- to 5-fold in children and adolescents between the ages of 6 and 19 years, so that 16% of both 6 -11 and 12-19 year olds met these criteria in 2002. (5)

According to the World Health Organization, the Eastern Mediterranean Region (EMR) refers to all Arab Countries, excluding Algeria, in addition to Afghanistan, Iran, and Pakistan.(6)

Obesity has become an epidemic in many parts of the world. The World Health Organization has warned of the escalating epidemic of obesity that could put the population in many countries at risk of developing non communicable diseases (NCD). Available studies in Eastern Mediterranean countries indicate that obesity has reached an alarming level among both children and adults. Consequently, the incidence of NCD is also very high and represents more than 50% of total causes of death in the EMR. (6, 7)

The high prevalence of NCD in EMR has a great impact on the health care system, economic and social situation in this region. Evidence suggests that even a moderate amount of weight loss can be useful in reducing levels of some risk factors for NCD (8). Unfortunately, national intervention programs to prevent and control obesity in EMR are relatively absent.

Obesity is measured by various methods such as body mass index (BMI), waist circumference, waist-hip ratio, skinfold, and percent body fat measurements. (9)

The case for children and adolescents is, however, different because unlike adults, BMI changes significantly with age during these stages of growth. (10)

Most countries in Asia, Latin America, Northern Africa, the Middle East and the urban areas of sub-Saharan Africa have all experienced a shift in the overall structure of its dietary pattern with related disease patterns over the last few decades. In fact, the prevalence of overweight and obesity in the GCC, in some cases, is exceeding that of many developed nations. (11)

The prevalence of obesity parallels increased industrial development, which in the Arabian Gulf is related to the significant growth in incomes resulting from the rich deposits of oil reserves and the resultant impact on rapid urbanization and improved living conditions. (12)

The prevalence of obesity has increased at an alarming rate during the last three decades, and this appears to be more pronounced in women. It is well established that women generally have a higher percentage of body fat than men. Adipocyte size was also increased 45% compared to similar-aged boys, although adipocyte size shows substantial regional variation and is not necessarily greater in women in all adipose depots (13,14).

Women who embrace religions, such as Islam, that prescribe guidelines related to modest dress or covering the body that Muslim women who choose to dress “Islamically” commonly feel free of Western views of women as sex objects. It is believed that placing less emphasis on the public appearance of the physical body enables women to pursue interests such as school and employment without being under the “wandering gaze of men”. (15)

Subjects and Methods

A cross-sectional study was carried out in Al Karkh side of Baghdad during the period from the 1st of March through May 2012 involving 18 governmental secondary schools for girls; 2690 was the total number of girls who participated in this study. In each school the researcher introduced herself to the headmistress and the approval of the ministry of education to carry out the research was shown to her and then the process and purpose of the study were explained to her.

In each class the researcher introduced herself to the teacher and students and they were informed about the aim of the visit and the procedure of measurements which included taking body weight without shoes by digital scale after calibration and asking the student to take off the heavy clothes and remain only in the light uniform, while the height was measured by microtoise while standing against the wall with shoes off and with the back of the head, shoulders and heels touching the wall. Weight was measured in kilograms with an accepted error of 0.1 kg. Height was measured in centimeters with an accepted error of 0.1 cm. Each student was asked about her date of birth which was registered.

Students with chronic disease, or pregnancy were excluded from the study. Body mass index was calculated according to the formula BMI=weight (kg)/height(m^2), then according to the international cut off points for adolescent females’ BMI tables, students were classified as underweight, normal, overweight, obese and morbidly obese.(16)

Results

The study involved 2690 girls from 18 governmental secondary schools in Al-karkh side of Baghdad. Their ages were between 15-23 years. (See Figures and Tables - commencing next page)

Discussion

Overweight and obesity is considered to be an epidemic in many developed and developing countries of the world. (17) The rapid development over the last 20 years in the Arab world has brought significant prosperity and easier life-styles in terms of transport, access to cheap migrant labor, proliferation of Western style fast food, and as elsewhere, greater opportunities for sedentary lifestyles. These factors created an “obesogenic environment” around the Arabic-speaking countries. (11)

Available studies in Eastern Mediterranean countries indicate that obesity has reached an alarming level among both children and adults. Consequently, the incidence of non-communicable disease is also very high and represents more than 50% of total causes of death in the EMR. (6, 7)

The prevalence of obesity among Iraqi adult females aged 15 and more in 2010 was 19%. (18)

The study results showed obesity percentage of 9% in females aged 15-18+ years and overweight 24%, while morbid obesity was 0.9%. So the overall prevalence of overweight and obesity among the sample was 33%.

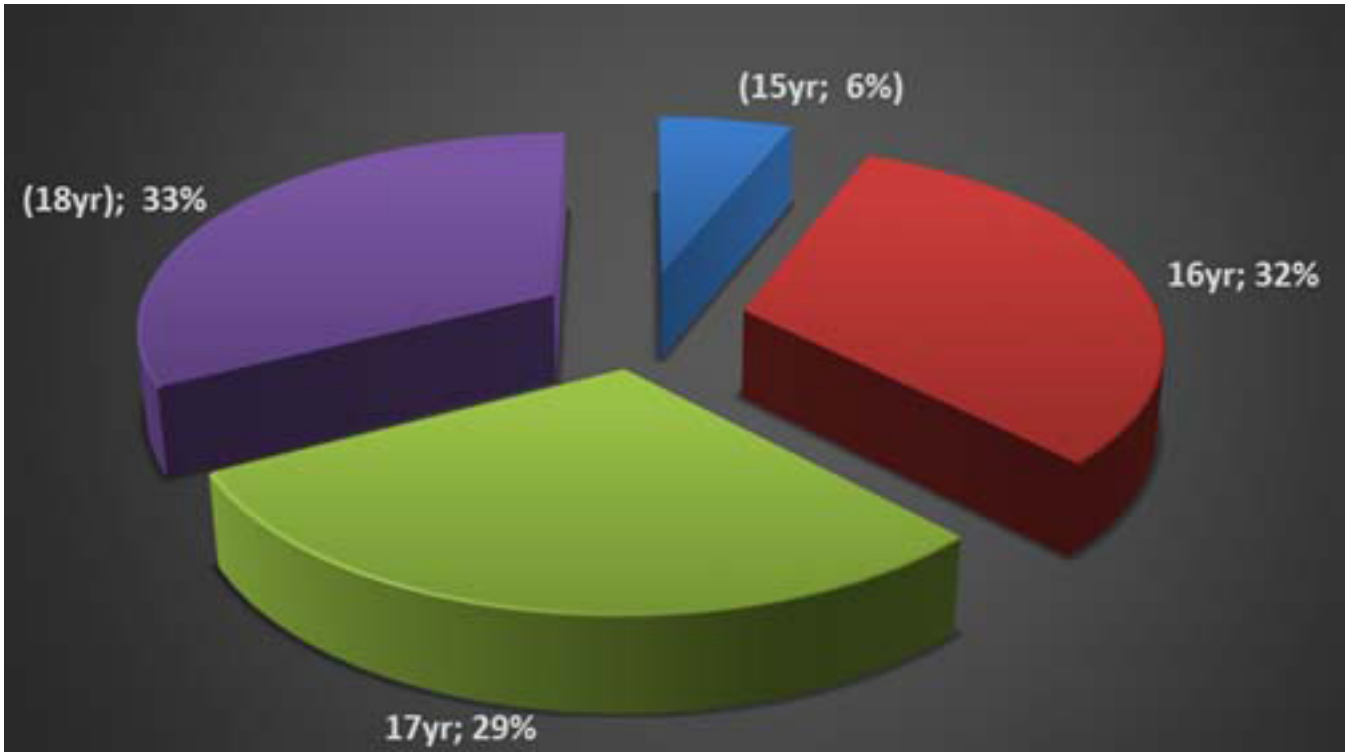

Figure 1: Percentage of age distribution of 2690 secondary school female students in Baghdad in 2012.

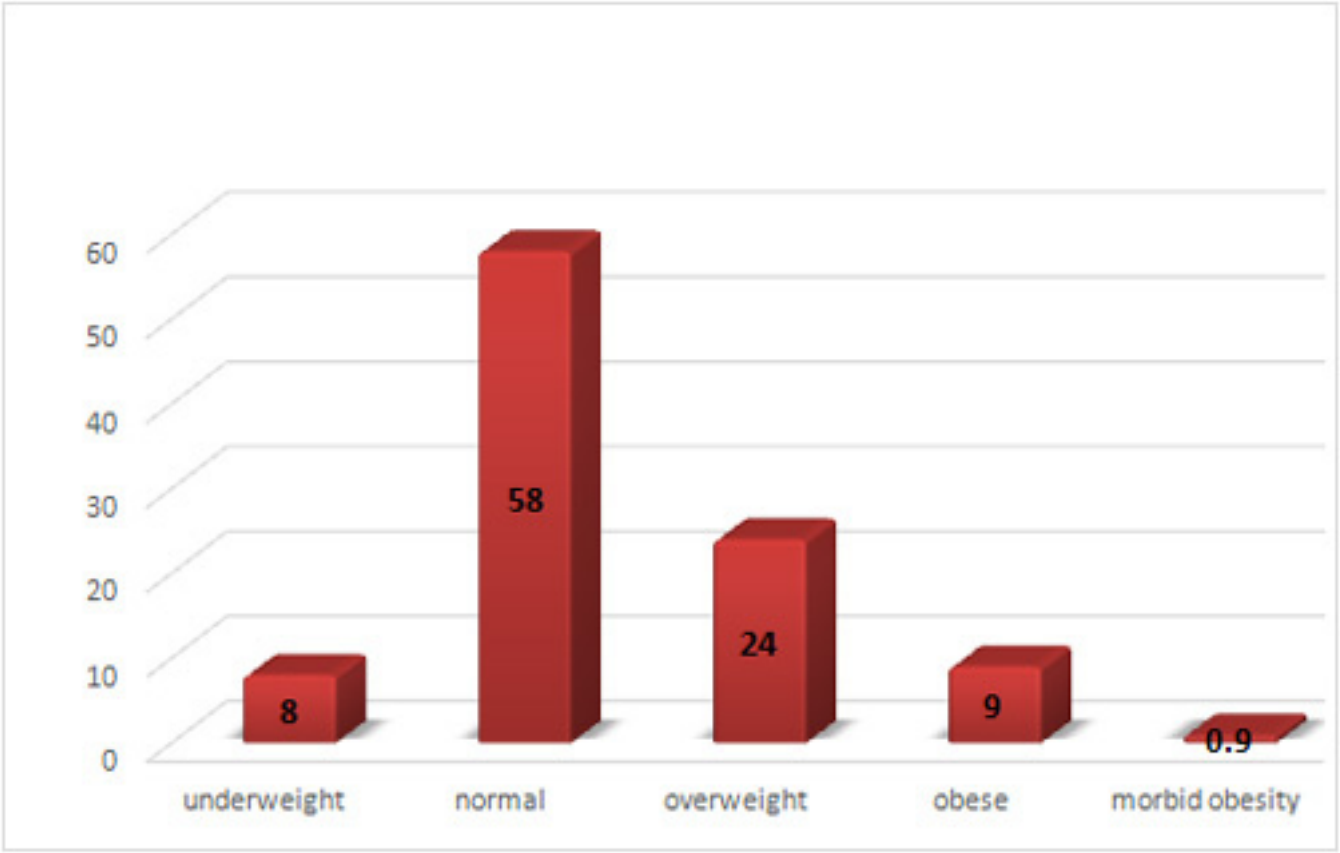

Figure 2: BMI percentage of 2690 secondary school females

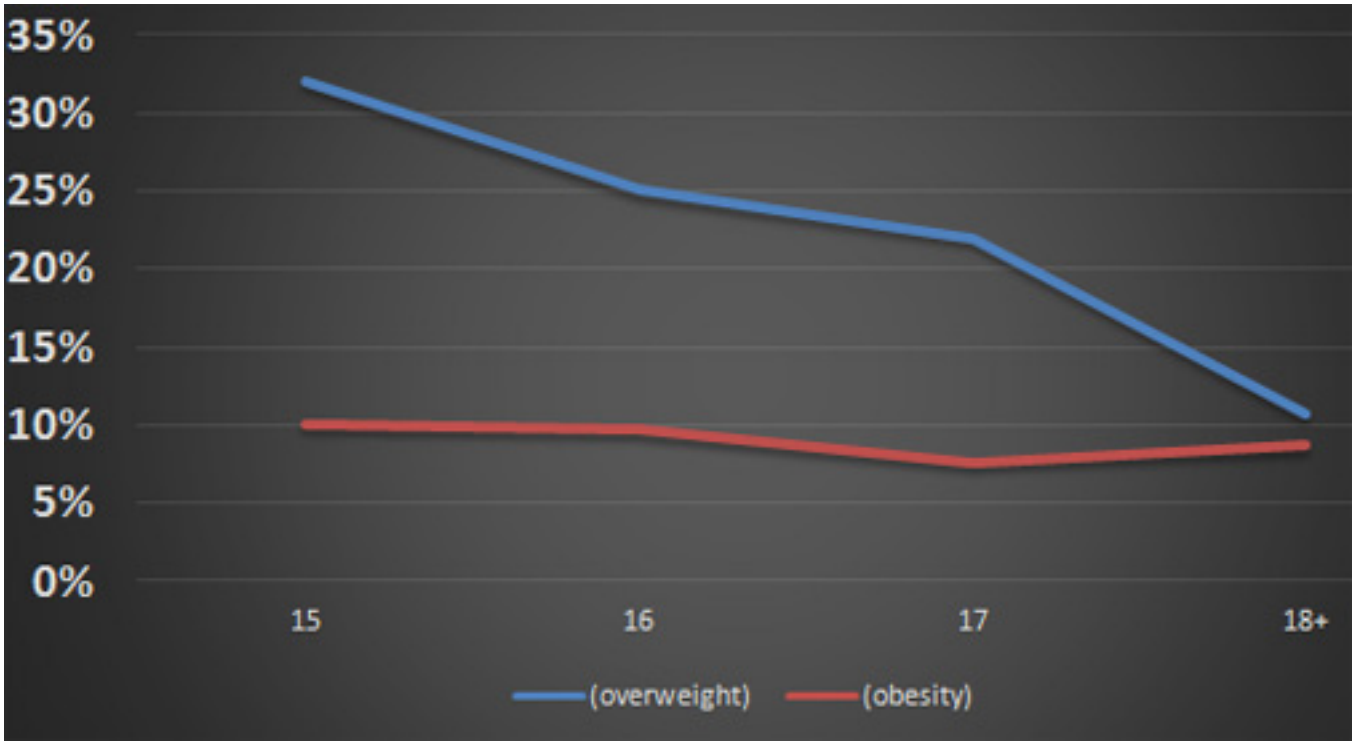

Figure 3: Obesity and over-weight percentage related to age

	15 -15.9	16- 16.9	17 -17.9	18 and more	Total
Under weight	4	48	69	87	208
Normal	92	498	489	518	1579
Over weight	54	218	179	196	647
Obese	17	80	60	73	230
Morbid obesity	0	2	2	4	8
Total	167	846	799	878	2690

Table 1: Distribution of BMI of 2960 secondary school students in Baghdad 2012 according to their ages

Upon comparing these results with the results of the study done in Irbid in Jordan 2008 which had close results regarding the percentage of obesity (8.7%), while for overweight it was 15.7% so the overall obesity and overweight % was 26.4%. (19)

We can compare these results with the study of Öner et al. done in Turkey in 2004 which reported that in Turkish adolescent girls the prevalence of underweight, overweight and obesity were 11.1%, 10.6% and 2.1% respectively .(20)

Also the results were comparable with the results of the study in Rasht Iran on 2006-2007 where the overall prevalence of overweight and obesity in adolescent females was 18.6% and 5.9% respectively, so as for the Qatari adolescent females in a study done in 2006 with overweight of 18.9% and 4.7% obesity. (21, 22).

In the same study, the prevalence of obesity in al Kuwait was twice that of the study results (20.6%) while the overweight percentage although close was still less than this study results (20.8%). (6)

It was the same as in the study done in Saudi Arabia in 2005 with a higher percentage of obesity 11.8 and a lower percentage of overweight (17.2%). (23)

Over weight in this sample was the highest among the studies we compared with, but not for obesity.

Regarding morbid obesity, it was relatively low (0.9%) and the studies being compared to did not take it into consideration. The adoption of Western diets high in refined carbohydrates, saturated fats and sugars, as well as more sedentary lifestyle (often arising from security concerns) are commonly cited as the major contributors to the increase of overweight.(25)

Besides, when comparing the per capita gross domestic product of Iraqis we can see that it was $770 in 2002 while it became $3,100 in 2008 which reflects the high percentage of overweight after the US invasion of Iraq. (26)

For underweight it was 8% and upon comparing it with the study in Iran shows a very high percentage of 54.6 while in Irbid, Jordan it was considerably lower (5.8%) (19, 24).

Conclusion and Recommendation

The study showed a high prevalence of overweight which was the highest among the countries of the Arabian Gulf, while obesity percentage although it was high, was comparable with the neighbouring countries. This could reflect the westernized food habits which found their way into the country following the USA invasion which also caused the insecurity Sequelae reflected by: staying indoors and the necessity of transportation using vehicles even to nearby places which were previously walked by foot, especially for females to ensure safety from the risk of kidnapping which revived after the USA invasion of Iraq.

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Determinants of smoking initiation and smoking cessation among employees of oil companies in Kuwait

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Abstract

Aim: To identify the determinants of smoking initiation and smoking cessation among oil employees in Kuwait; and assess their association with demographic and work-related variables.

Methods: Cross-sectional study was conducted and included a stratified random sample of 2055 employees from 10 oil companies using a modified version of the standard WHO questionnaire for surveying smoking. The multivariate logistic regression analysis was used to identify the independent determinants for smoking initiation, after adjustment for potential confounders.

Results: The prevalence of former and current smoking among oil employees was 20.6% (95% confidence interval (CI) = 16.8 - 24.5%) and 25.3% (95% CI = 21.6 - 29.4%) respectively. The mean age at initiation of smoking was 19.5 years in males, and 24.8 years in females. Multivariate logistic regression analysis showed that the following factors were independently associated with smoking initiation: male gender (adjusted odds ratio, OR = 10.5, 95% CI = 6.6 - 16.6, p<0.001), Kuwaiti national (OR = 1.9, 95% CI = 1.3 - 2.9, p = 0.002), age 30-39 years (OR = 1.6, 95% CI = 1.1 - 2.5, p = 0.02), low income (OR = 2.1, 95% CI=1.1 - 4.0, p = 0.027), High school education or less (OR = 3.2, 95% CI = 2.0 - 5.0, p<0.001), and not satisfied with job (OR = 1.5, 95% CI = 1.2 - 2.1, p=0.031). Smoking cessation was associated with starting smoking at older age (hence, having shorter smoking duration), and smoke less number of cigarette packs per day. About 84.6% of current smokers reported that they thought about quitting smoking and 61.2% had attempted to stop smoking.

Conclusion: Educational programs may be organized to educate these employees about the hazards of smoking and encourage them to practice the preventable measures for quitting smoking. The articles of the tobacco-control legislation approved by the National Assembly of Kuwait should be strictly implemented.

Keywords: Smoking initiation; smoking cessation; socio-demographic factors; work-related factors; oil employees; Kuwait

Introduction

Smoking is now established as a recognized cause of cancer, lung disease and stroke; it is considered to be the single most preventable cause of premature morbidity and mortality (WHO, 2011; Doll et al., 1994). WHO estimated that over one billion people smoke worldwide causing premature deaths that account for up to 30% of cancer deaths (Adhikari, 2008).

In Kuwait, the prevalence of smoking was estimated to be 34.4% among men and 1.9% among women. The highest prevalence among men was observed in the youngest age group (< 20 years). Among women, the highest prevalence was observed in the older age group (46-50 years). On average, men began smoking at an earlier age (18 years) than women (21 years). Former smokers constituted 8.8%; half of them had quit smoking between the ages of 20 and 29 years and smoked for less time than current smokers. The significant factors which were found independently associated with smoking were: lower level of education, and being divorced or widowed (Memon et al., 2000; Fakher, 2009). Another study (Moody et al:, 1999) showed that the highest risk of smoking initiation was found among those Kuwaiti males who had a history of smoking in family and friends, and among individuals in the lowest education category. The study also showed that the highest probability of smoking initiation was at the age group 15 - 20 years. A study (Siddiqui et al., 2001) concluded that the prevalence of smoking in Saudi Arabia was 34.4% and the most common reason for starting smoking was friends' influence.

Age of smoking initiation is a major determinant of the risk of tobacco-related health problems that expresses itself many years after initiation. Smokers who start smoking at an earlier age were found to smoke more cigarettes a day, were more dependent on smoking and had less interest and confidence in their ability to quit smoking (Lando et al., 1999; Baron - Epel and Haviv - Messika, 2004). Many other variables influence the decision to start smoking; this has been studied mainly in adolescents. The most influential variables were social: having friends, family members and people who they admire smoke (Unger and Chen, 1999; Anda et al., 1999). Thus, cultural and social factors affect the age of smoking initiation. In the USA, about 80% of adult smokers began smoking by the age of 18; little new smoking initiation occurs in adulthood (Chassin et al., 1996). Also, social and work stress have been shown to be a predictor for smoking initiation (Lloyd and Taylor, 2004).

Studies revealed a considerable genetic contribution to the risk of smoking initiation in addition to environmental factors (Wang and Li, 2010). Parental smoking significantly increases the offspring's hazards to start smoking (Gohlmann et al., 2009). An important public health concern is that younger age at smoking initiation was found to be associated with increased lung cancer mortality, independent of years smoked, or number of cigarettes smoked per day. (Knocke et al., 2004; Wilkinson et al., 2007; Oh et al. (2010) reported that being young, divorced, having friends/family who smoke, and having parents who smoke were all significantly associated with ever smoking. The most frequently reported reason for smoking initiation was friend smoking. A study (van Loon et al., 2005) concluded that smoking cessation was associated with socio-demographic and tobacco use-related factors. Older, married persons and those who smoked less cigarettes per day had a higher likelihood of quitting smoking, both for men and women.

Many European countries have recently made substantial changes in policy towards smoking and tobacco. The European Community as an entity, in addition to all major European Region countries, except the Czech Republic has ratified the World Health Organization's Framework Convention on Tobacco Control (FCTC). The FCTC became international law in 2004 and is a comprehensive tobacco control treaty which includes an article for 100% smoke-free policies (Joossens and Raw, 2006). In parallel, the National Assembly in Kuwait approved legislation for tobacco control in 1995. In addition, a sub-clause of that law related to restriction of smoking in public places (smoke-free) was enforced in February 2012. However, there is a danger that social, cultural or religious inhibitions may prevent smokers from providing accurate information about their smoking habits (Siddiqui et al., 2000).

The oil production industry is well recognized as a stressful occupation (Sutherland and Cooper, 1996; Chen et al., 2003). Also, some oil workers follow a work-shift schedule which may lead to psychological disorders (Bourdoux et al., 1999). Smoking has been consistently reported to be a coping behaviour for dealing with stress. Identification of factors associated with smoking initiation and cessation may result in the emergence of strategies to aid the process. Most of the research on smoking has been performed on adolescents. Therefore, studying smoking initiation and cessations on adults may add to our understanding of smoking, and enable the development and implementation of strategies to control its impact.

The objective of this study was to identify the determinants of smoking initiation and cessation among oil employees in Kuwait; and assess their association with demographic and work-related variables.

Methods

Study population and sampling procedure

The present cross-sectional study was conducted during the period January-April 2012. There are 10 oil companies in Kuwait. The study adopted a stratified random sampling scheme, and included samples from each company with size proportional to the number of workers in each. Lists of employees were obtained from the supervisors in each company and were used as sampling frames. A total of 2,123 workers

were selected; 2055 completed the questionnaire (response rate 96.8%). The rationale for studying this population was the importance of this cross-section of employees since oil industry accounts for 95% of export revenues and 80% of government income in Kuwait (Ministry of Planning, 2010).

Sample size estimation was based on 95% confidence interval (type 1 error = 0.05), 30% prevalence of smoking, power 80% (type 2 error, = 0.2) and precision 4%. After considering 20% non-response, the sample size was 2100 which represents 13.3% of the number of employees in the oil companies.

Data Collection

Data were collected using an anonymous self-administered questionnaire. The study used a modified version of the standard WHO questionnaire for surveying smoking prevalence and behaviour (WHO, 1983). The questionnaire included 4 sections: 1) socio-demographic characteristics: age, gender, nationality, marital status, residence, religion, education, income and physical exercise; 2) work-related aspects: nature of job, place of work, occupation, shift duty and job satisfaction; 3) smoking behaviour: smoking status, type of smoking, number of packs of cigarettes or heads of shisha per day, age at starting smoking, school stage at starting smoking, influence to smoke, attempts for quitting smoking, relatives who smoke); 4) reasons for initiation of smoking (20 reasons).

In order to pre-test the questionnaire, replicate responses were collected on a sample of 50 workers 4 weeks after the initial response, and high agreement (range of the measure of agreement, Kappa = 0.74 - 0.90) was found between the two responses in various items of the questionnaire. The study protocol was approved by the Research Committee of Al-Ahmadi hospital.

The questionnaire and a covering letter were administered to each participant during regular working hours by trained research assistants. The letter informed participants about the purpose of the study, and requested their written informed consent to participate. Clear instructions on how to complete the questionnaire were also given. Completed questionnaires were placed into a sealed envelope marked as “Confidential” and returned to a specific research assistant for subsequent data analyses.

Data analysis

The Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA, 2010) version 19 was used for data analysis. A p value of < 0.05 was considered significant. Pearson’s Chi-square (2) test was used to assess the association between two qualitative variables, and Chi-square for linear trend was used to assess the association between an ordinal variable with a binary variable.

The unpaired t-test was used to assess the significance of the difference between means of two normally distributed groups, and the non-parametric Mann-Whitney U test was used to compare the median of two non-normal quantitative variables. The multivariate logistic regression for a binary outcome variable was used to identify the independent determinants for smoking initiation, after adjustment for potential confounders. The dependent variable was binary (0 for never smoked and 1 for former or current smoker). Independent variables included socio-demographic and work-related variables.

Results

Socio-demographic characteristics

Respondents reported their age with mean ± standard deviation, SD (40.8 ± 10.1 years), range 21 to 65 years. The male: female ratio was 3.9:1 and the Kuwaiti: Non-Kuwaiti ratio was 1.7:1. Female employees were significantly younger than males, age (±SD) was 41.5 (±10.1), 37.6 (±9.3) for males and females respectively (unpaired t-test, p<0.001). The majority of respondents were married (85.6%), Muslims (83.1%) with monthly income above K.D. 1500 (72.3%). The majority (64%) were university graduates, and more than half of them (57.4%) reported performing light physical exercise, Table 1 (next page).

Work-related aspects

Only 6.1% of respondents reported that they work offshore, and about a quarter (26%) of participants were oil-field workers, mainly males (31.8%) versus 3.2% females (t-test, p<0.001). The majority (70.9%) were office workers, with an excess of females (93.6%) over males (65.2%). Respondents included drilling workers (3.2%), derrick workers (4.7%), managers (30.4%), electricians (20.6%) and deck workers (15.9%). The majority (87.6%) responded that they were satisfied with their job, 20.4% of them work in a shift duty system, Table 2 (page 36).

Smoking behaviour

Table 3 presents a description of the smoking behaviour of respondents. A former-smoker was defined as a person who used to smoke cigarettes daily for 6 continuous months or more. The prevalence of former and current smoking were 20.6% (95% confidence interval, CI=16.8-24.5) and 25.3% (95% CI= 21.6-29.4%) respectively. The prevalence rates of former smoking in males and females were 24.1% and 6.0% respectively, while the rates of current smoking were 29.7% and 7.6% in males and females respectively. There was a significant association between smoking status and gender (Pearson Chi-square test, p<0.001). Significantly higher proportions of males were former or current smokers than females. Regarding type of smoking, the majority (76.5%) reported smoking cigarettes compared to 11.6% who smoked shisha. There was a significant association between type of smoking and gender (Pearson Chi-square test, p<0.001). A higher proportion (78%) of males reported smoking cigarettes compared to 52.9% of females. On the other hand, a higher proportion of females (21.6%) smoked shisha versus 11.0% of males.

Characteristic	All (n = 2055)	Male (n=1639)	Female (n=416)	p*
	n (%)	n (%)	n (%)	
Age at last birthday, years				**<0.001**
< 30	335 (16.3)	235 (14.3)	100 (24.0)	
30 – 39	599 (29.1)	454 (27.7)	145 (34.9)	
40 – 49	692 (33.7)	574 (35.1)	118 (28.4)	
≥50	429 (20.9)	376 (22.9)	53 (12.7)	
Mean (SD)	40.8 (10.1)	41.5 (10.1)	37.6 (9.3)	**<0.001[b]**
Nationality				0.673
Kuwaiti	1293 (62.4)	1027 (62.7)	256 (61.5)	
Non-Kuwaiti	772 (37.6)	612 (37.3)	160 (38.5)	
Marital status				**<0.001**
Single	236 (11.5)	125 (7.6)	111 (26.7)	
Married	1764 (85.8)	1491 (91.0)	273 (65.7)	
Divorced	39 (1.9)	18 (1.1)	21 (5.0)	
Widowed	16 (0.8)	5 (0.3)	11 (2.6)	
Residence				**<0.001**
Capital	385 (18.9)	280 (17.2)	105 (25.7)	
Farwania	144 (7.1)	120 (7.4)	24 (5.9)	
Hawali	533 (26.2)	377 (23.2)	156 (38.1)	
Jahra	21 (1.0)	19 (1.2)	2 (0.5)	
Ahmadi	732 (36.0)	654 (40.2)	78 (19.1)	
Mubarak Al-Kabeer	221 (10.9)	177 (10.9)	44 (10.8)	
Religion				**<0.001**
Muslim	1708 (83.1)	1353 (82.6)	355 (85.3)	
Christian	144 (7.0)	92 (5.6)	52 (12.5)	
Others	203 (9.9)	194 (11.8)	9 (2.2)	
Monthly income (K.D.)				**<0.001**
< 700	132 (6.6)	81 (5.1)	51 (12.7)	
700 - 1000	100 (5.0)	64 (4.0)	36 (9.0)	
1001 - 1500	320 (16.0)	208 3.1)	112 (27.9)	
> 1500	1443 (72.4)	1240 (77.8)	203 (50.5)	
Education level				**<0.001**
High school or less	276 (13.6)	240 (14.8)	36 (8.8)	
Intermediate Diploma	456 (22.4)	318 (19.5)	138 (33.7)	
University or above	1304 (64.0)	1069 (65.7)	235 (57.5)	

SD= Standard deviation; Range (Minimum, Maximum); K.D.= Kuwaiti Dinar ~ US $ 3.30
Frequencies may not add to the total number of employees due to missings.
p-values were generated using: [a]Pearson Chi-square test, [b] t-test, [c]Mann-Whitney U test.

Table 1: Socio-demographic characteristics as were self-reported by the participating oil employees (Part A)

(Table 1, Part B continues on next page)

Characteristic	All (n = 2055)	Male (n=1639)	Female (n=416)	p*
	n (%)	n (%)	n (%)	
Physical exercise				
None	457 (23.0)	337 (21.2)	120 (29.9)	
Light (e.g. Walking)	1141 (57.4)	905 (57.0)	236 (58.9)	
Moderate (e.g. Volley ball, bicycling)	124 (6.2)	112 (7.1)	12 (3.0)	
Vigorous (e.g. Football, aerobics)	267 (13.4)	234 (14.7)	33 (8.2)	
Number of days exercised per week				**<0.001[c]**
Median (Range)	3 (1, 7)	3 (1,7)	2 (1, 7)	
Duration of each session of exercise				0.136
0 - 30 min.	716 (45.2)	571 (44.0)	145 (50.5)	
31 - 60 min.	627 (39.6)	519 (40.0)	108 (37.6)	
61 - 120 min.	203 (12.8)	173 (13.3)	30 (10.5)	
> 120 min.	38 (2.4)	34 (2.6)	4 (1.4)	

SD= Standard deviation; Range (Minimum, Maximum); K.D.= Kuwaiti Dinar ~ US $ 3.30
Frequencies may not add to the total number of employees due to missings.
p-values were generated using: aPearson Chi-square test, b t-test, c(superscript) Mann-Whitney U test.
Table 1: Socio-demographic characteristics as were self-reported by the participating oil employees (Part B)

Table 3 also shows that the mean age at initiation of smoking among males and females was 19.5 and 24.8 years respectively. The difference was significant (t-test, p<0.001). Most females (72.5%) started smoking at university stage, while males initiated smoking at high school stage (37.1%), (Chi-square for linear trend, p=0.026). Friends were the main source (30.1%) who were reported by respondents to influence them to smoke, followed by classmates (13.9%), Figure 1. A higher proportion of males (46.2%) imitated their brothers, while females (10.2%) imitated their sisters and mothers. About 84.6% of current smokers thought about quitting smoking, with a significantly less proportion (67.9%) of females (Pearson Chi-square test, p=0.025). Furthermore, 61.2% of current smokers reported that they made a serious attempt to stop smoking, with a significantly lower proportion (35.7%) of females (Pearson Chi-square test, p=0.004). About 12.5% of participants reported having been diagnosed by a physician to have bronchial asthma.

Smoking pattern of former smokers

Table 4 presents the smoking pattern of former smokers. Most of the ex-smokers started smoking at a late age (28.9% of them started smoking at age 20 to 24 years), and the majority of them (53.9%) started smoking at university stage. In addition, most of them (78.0%) were smoking only one pack of cigarettes per day. Hence, smoking cessation was associated with starting smoking at older age (i.e. having shorter smoking duration), and smoking less number of cigarette packs per day.

Reasons for initiation of smoking

Table 5 and Figure 2 present the reasons that motivate initiation of smoking as were reported by respondents according to gender. There was a significant difference between males and females regarding the following reasons for initiation of smoking: imitation of friends (Pearson Chi-square, p=0.006), being in a smoking environment (p=0.005), negligence of parents and poor supervision (p=0.043), masculinity (p<0.001), new experience (p<0.001), marital misunderstanding (p<0.001), parental divorce (p=0.001), enjoy pleasant events (p=0.013), to enhance mental activity (p=0.001), and to lose weight (p<0.001). A significantly higher proportion of female respondents thought that the following reasons motivate initiation of smoking: imitation of friends, family members or grown-ups (73.1% of females versus 66% of males), new experience (43.3% of females versus 31.6% of males), marital misunderstandings (37.5%

Characteristic	All (n = 2055)	Gender		p
		Male (n=1639)	Female (n=416)	
	n (%)	n (%)	n (%)	
Nature of job				0.137
On-shore	1890 (93.9)	1515 (94.3)	375 (92.4)	
Off-shore	122 (6.1)	91 (5.7)	31 (7.6)	
Type of work				
Office worker	1427 (70.9)	1047 (65.2)	380 (93.6)	**<0.001**
Lab worker	62 (3.1)	49 (3.1)	13 (3.2)	
Oil-field worker	523 (26.0)	510 (31.8)	13 (3.2)	
Occupation				
Manager	625 (30.4)	563 (34.4)	62 (14.9)	**<0.001**
Electrician	424 (20.6)	308 (18.8)	116 (27.9)	**<0.001**
Deck worker	327 (15.9)	292 (17.8)	35 (8.4)	**<0.001**
Materials worker	300 (14.6)	142 (8.7)	158 (38.0)	**<0.001**
Power worker	261 (12.7)	253 (15.4)	8 (1.9)	**<0.001**
Derrick worker	97 (4.7)	67 (4.1)	30 (7.2)	**0.007**
Mechanic	83 (4.0)	73 (4.5)	10 (2.4)	0.058
Drilling worker	65 (3.2)	52 (3.2)	13 (3.1)	0.960
Do you work in a shift duty system?				
Yes	407 (20.4)	387 (24.3)	20 (5.0)	**<0.001**
Are you satisfied with your job?				
Yes	1748 (87.6)	1405 (88.2)	343 (85.3)	0.118

• Frequencies may not add to the total number of employees due to absences.
• p-values were generated using Pearson Chi-square test.

Table 2: Work-related aspects of participating oil employees

of females versus 28% of males), parental divorce (26.7% of females versus 21.5% of males), to lose weight (20.7% of females versus 11.7% of males). On the other hand, a significantly higher proportion of male respondents thought that the following reasons motivate initiation of smoking: enjoy pleasant events (18.4% of males versus 13.2% of females), and to enhance mental activity (15.6% of males versus 9.4% of females).

Association of smoking status with socio-demographic characteristics

Table 6 depicts the association between smoking status and socio-demographic characteristics of respondents. There was a significant inverse relationship between age and current smoking (Pearson Chi-square, p<0.001). As age advances from <30 to >50 years, the proportion of current smokers consistently decreases from 30.3% to 18.7%.

Characteristic	All (n = 2055)	Gender		p[a]
		Male (n=1639)	Female (n=416)	
	n (%)	n (%)	n (%)	
Smoking status				**<0.001**
Never smoked	1053 (54.1)	723 (46.2)	330 (86.4)	
Ex-smoker (daily for ≥ 6 months)	400 (20.6)	377 (24.1)	23 (6.0)	
Current smoker	493 (25.3)	464 (29.7)	29 (7.6)	
Type of smoking				**<0.001[b]**
Cigarette	667 (76.5)	640 (78.0)	27 (52.9)	
Shisha	101 (11.6)	90 (11.0)	11 (21.6)	
Both Cigarette and Shisha	104 (11.9)	91 (11.1)	13 (25.5)	
Number of cigarette packs per day				0.404
One pack	603 (78.6)	569 (78.2)	34 (87.2)	
Two packs	136 (17.7)	132 (18.1)	4 (10.3)	
More than two	28 (3.7)	27 (3.7)	1 (2.6)	
Number of shisha heads per day				**0.019**
One head	127 (62.3)	111 (61.7)	16 (66.7)	
Two heads	42 (20.6)	39 (21.7)	3 (12.5)	
More than two	35 (1.7)	30 (16.7)	5 (20.8)	
At what age (in year) did you start smoking?				**<0.001**
< 10	5 (0.6)	5 (0.6)	-	
10 - 14	76 (8.7)	75 (9.1)	1 (2.0)	
15 - 19	407 (46.7)	394 (48.0)	13 (25.5)	
20 - 24	246 (28.2)	233 (28.4)	13 (25.5)	
25 - 29	82 (9.4)	71 (8.6)	11 (21.6)	
≥ 30	56 (6.4)	43 (5.2)	13 (25.5)	
Mean (SD)	19.8 (5.6)	19.5 (5.2)	24.8 (8.0)	**<0.001[c]**
At which school stage did you start smoking?				**0.026**
Elementary	10 (1.1)	10 (1.2)	-	
Intermediate	91 (10.4)	88 (10.7)	3 (5.9)	
High school	316 (36.2)	305 (37.1)	11 (21.6)	
University	455 (52.2)	418 (50.9)	37 (72.5)	

• SD= Standard deviation
• Frequencies may not add to the total number of employees due to absences.
• p-values were generated using: aChi-square for linear trend, bPearson Chi-square, ct-test.
• The two questions: "Who influenced you to smoke" and "Do any of the following relatives smoke" are multiple response questions, i.e. a respondent may choose more than one option.

Table 3: Smoking behaviour of participating oil employees (Part A)

(Part B continues next page)

Characteristic	All (n = 2055)	Gender		p[b]
		Male (n=1639)	Female (n=416)	
	n (%)	n (%)	n (%)	
Who influenced you to smoke? (Yes)				
Family member	115 (5.6)	102 (6.2)	13 (3.1)	**0.014[b]**
Friends	618 (30.1)	583 (35.6)	35 (8.4)	**<0.001**
Classmates	286 (13.9)	278 (17.0)	8 (1.9)	**<0.001**
Mass media	66 (3.2)	64 (3.9)	2 (0.5)	**<0.001**
Colleague from work	104 (5.1)	101 (6.2)	3 (0.7)	**<0.001**
Do any of the following relatives smoke? (Yes)				
Father	541 (27.8)	427 (27.3)	114 (29.8)	0.320
Mother	68 (3.5)	43 (2.7)	25 (6.5)	**<0.001**
Brother	915 (47.0)	723 (46.2)	192 (50.3)	0.154
Sister	72 (3.7)	33 (2.1)	39 (10.2)	**<0.001**
Grand parent	283 (14.5)	216 (13.8)	67 (17.5)	0.063
If you are a current smoker, have you ever thought about quitting smoking?				**0.025**
Yes	408 (84.6)	389 (85.7)	19 (67.9)	
No	74 (15.4)	65 (14.3)	9 (32.1)	
If you are a current smoker, have you ever made a serious attempt to stop smoking?				**0.004**
Yes	295 (61.2)	285 (62.8)	10 (35.7)	
No	187 (38.8)	169 (37.2)	18 (64.3)	
Have you been diagnosed by a physician to have bronchial asthma?				0.626
Yes	237 (12.5)	187 (12.3)	50 (13.3)	
No	1656 (87.5)	1329 (87.7)	327 (86.7)	

• SD= Standard deviation
• Frequencies may not add to the total number of employees due to absences.
• p-values were generated using: aChi-square for linear trend, bPearson Chi-square, ct-test.
• The two questions: “Who influenced you to smoke” and “Do any of the following relatives smoke” are multiple response questions, i.e. a respondent may choose more than one option.

Table 3: Smoking behaviour of participating oil employees (Part B)

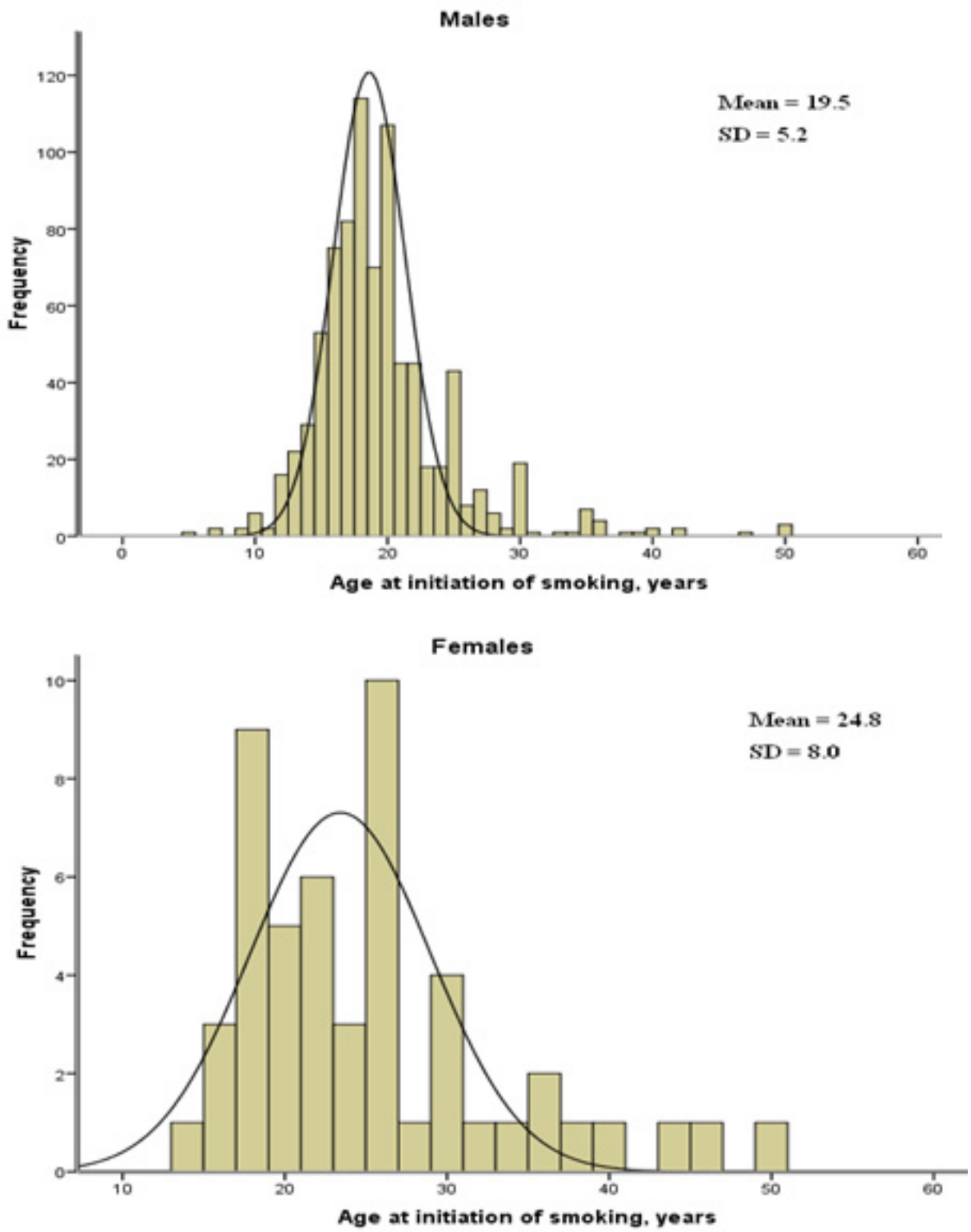

Figure 1: Frequency distribution of self-reported age at initiation of smoking according to gender

With respect to gender, the proportion of current smokers among males was almost 4 times the proportion of current smokers among females (29.7% in males, 7.6% in females, p<0.001). Regarding nationality, the proportion of current smokers among Kuwaiti nationals was almost double the proportion of current smokers among non-Kuwaitis (31.8% current smokers in Kuwaitis versus 14.8% in non-Kuwaitis, p<0.001). The proportion of current smokers among divorced respondents was 37.1% compared to 25.3% among married respondents, p<0.001.

There was no consistent trend in the proportion of current smokers among various monthly income categories. The proportion of current smokers was higher among low income category (27.8%) and high income category (28%), while the proportion of current smokes was low in intermediate income categories (12.6% and 16.1% in the remaining two income categories K.D. 700 to 1000 and K.D. 1001 to 1500 respectively). Regarding education

Variable	Former smokers (n=400)
	n (%)
At what age (in year) did you start smoking?	
< 10	2 (0.5)
10 - 14	36 (9.3)
15 - 19	176 (45.4)
20 - 24	112 (28.9)
25 - 29	42 (10.8)
≥ 30	20 (5.2)
At which school stage did you start smoking?	
Elementary	4 (1.0)
Intermediate	43 (11.1)
High school	132 (34.0)
University	209 (53.9)
Number of packs of cigarettes per day	
One pack	280 (78.0)
`Two packs	60 (16.7)
More than two	19 (5.3)

Table 4: Smoking pattern of former smokers

level, there was a significant inverse relationship between education level and current smoking (Pearson Chi-square, p<0.001). As education level improved from high school or less to university and above, the proportion of current smokers consistently decreased from 41.2% to 21.2%. Hence, the significant socio-demographic factors which characterize a current smoker were being young, male, Kuwaiti, divorced, with low level of education, or low monthly income, Table 6.

Association of smoking status with work-related aspects

Table 7 shows that the proportion of current smokers is significantly higher among on-shore respondents (25.7%) than in offshore (19.2%), p=0.029. Also, the proportion of current smokers was significantly higher in oil-field workers (34%) than in office workers (22.6%) or lab workers (14%), p<0.001. Moreover, power workers had the highest rate of current smokers (37.8%) followed by electricians (30.6%), and deck workers (27.1%), while managers had the least rate of current smokers (20.4%). In addition, the proportion of current smokers among respondents who work in a shift duty system (35.4%) was significantly higher than in those who do not work in a shift duty system, p<0.001. Furthermore, the proportion of current smokers among participants who were satisfied with their job (24.4%) was significantly lower than in those who were not satisfied with their jobs, p=0.03. Hence, the significant work-related factors which characterize a current smoker were being oil-field worker, power worker, work in a shift duty system, or not satisfied with job, Table 7.

Table 8 presents the significant associated factors with smoking initiation using the multivariate logistic regression analysis in order to adjust confounding between variables. The dependent variable was binary (0 for never smoked and 1 for former or current smoker). Independent variables included socio-demographic and work-related variables. The significant variables which were found independently associated with initiation of smoking after adjusting for confounding were male gender (odds ratio, OR=10.5, 95% CI=6.6-16.6, p<0.001), Kuwaiti national (OR=1.9, 95% CI=1.3-2.9, p=0.002), age 30-39 years (OR=1.6, 95% CI=1.1-2.5, p=0.02), low income (OR=2.1, 95%CI=1.1-4.0, p=0.027), low education level (high school or less) (OR=3.2, 95% CI=2.0-5.0, p<0.-001), and not satisfied with job (OR=1.5, 95% CI=1.3-2.1, p=0.031). Accordingly, being male Kuwaiti, young age, with low income and low level of education, and not satisfied with job were found to be independent determinants for starting smoking.

Discussion

The present cross-sectional study included 2055 employees from the 10 oil companies in Kuwait. The aims of the study were: to identify the determinants of smoking initiation and cessation among oil employees, and investigate their association with demographic and work-related variables. The multivariate logistic regression analysis showed that male gender, Kuwait national, young age, low level of education, low income, and not satisfied with job were independently associated with initiation of smoking, after adjusting for potential confounders. In the meantime, smoking cessation was associated with starting smoking at older age (hence, having shorter smoking duration), and smoke less number of cigarette packs per day.

Smoking behaviour

In this study, the prevalence of former and current smoking among oil employees were 20.6% and 25.3% respectively. These rates are higher than those reported by Memon et al. (2000): 8.8% and 17.0% for former

Reason	All (n = 2055)	Gender		p
		Male (n=1639)	Female (n=416)	
	n (%)	n (%)	n (%)	
In your opinion, what are the reasons that motivate initiation of smoking? (Yes)				
• Imitation (of friends or family members or grownups)	1386 (67.4)	1082 (66.0)	304 (73.1)	**0.006**
• For fun (to look cool)	1097 (53.4)	882 (53.8)	215 (51.7)	0.437
• Being in a smoking environment	961 (46.8)	741 (45.2)	220 (52.9)	**0.005**
• Negligence of parents and poor supervision	932 (45.4)	725 (44.2)	207 (49.8)	**0.043**
• Masculising	894 (43.5)	668 (40.8)	226 (54.3)	**<0.001**
• Diwania (social gathering place)	870 (42.3)	686 (41.9)	184 (44.2)	0.381
• In conformity with friends	796 (38.7)	626 (38.2)	170 (40.9)	0.318
• To relieve boredom	763 (37.1)	625 (38.1)	138 (33.2)	0.061
• Relax (alleviate distress/stress)	761 (37.0)	620 (37.8)	141 (33.9)	0.138
• New experience	698 (34.0)	518 (31.6)	180 (43.3)	**<0.001**
• Poor religious insight	637 (31.0)	500 (30.5)	137 (32.9)	0.339
• Peer pressure	629 (30.6)	493 (30.1)	136 (32.7)	0.302
• Marital misunderstandings	615 (29.9)	459 (28.0)	156 (37.5)	**<0.001**
• Parental divorce	464 (22.6)	353 (21.5)	111 (26.7)	**0.025**
• Parental indulgence (spoiling)	416 (20.2)	335 (20.4)	81 (19.5)	0.661
• Enjoy pleasant events	356 (17.3)	301 (18.4)	55 (13.2)	**0.013**
• Death of one or both parents	339 (16.5)	261 (15.9)	78 (18.8)	0.166
• To enhance mental activity (Concentration)	295 (14.4)	256 (15.6)	39 (9.4)	**0.001**
• To lose weight	278 (13.5)	192 (11.7)	86 (20.7)	**<0.001**
• Parental insult	269 (13.1)	204 (12.4)	65 (15.6)	0.086

• Frequencies may not add to the total number of oil employees due to absences.
• The above question is a multiple response one, i.e. a respondent may choose more than one option.
• p-values were generated using Pearson Chi-square test.

Table 5: Reasons for initiation of smoking as were self-reported by participating oil employees

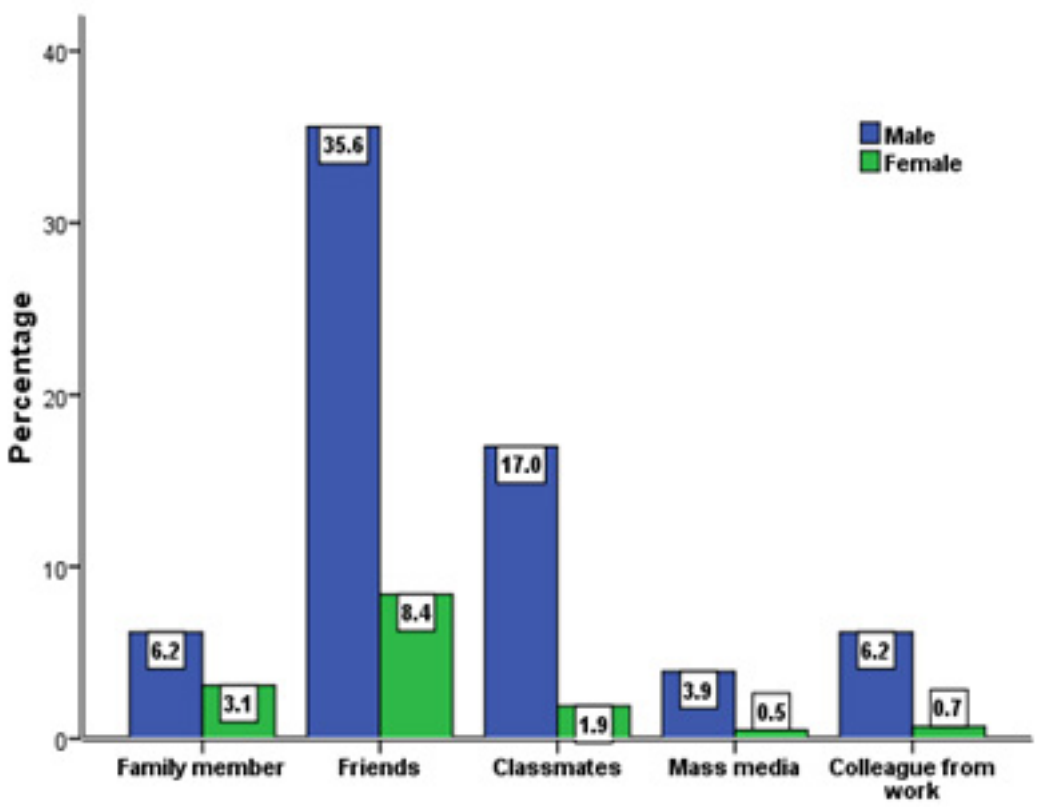

Figure 2. Frequency (%) of the sources who influenced smokers to initiate smoking according to gender

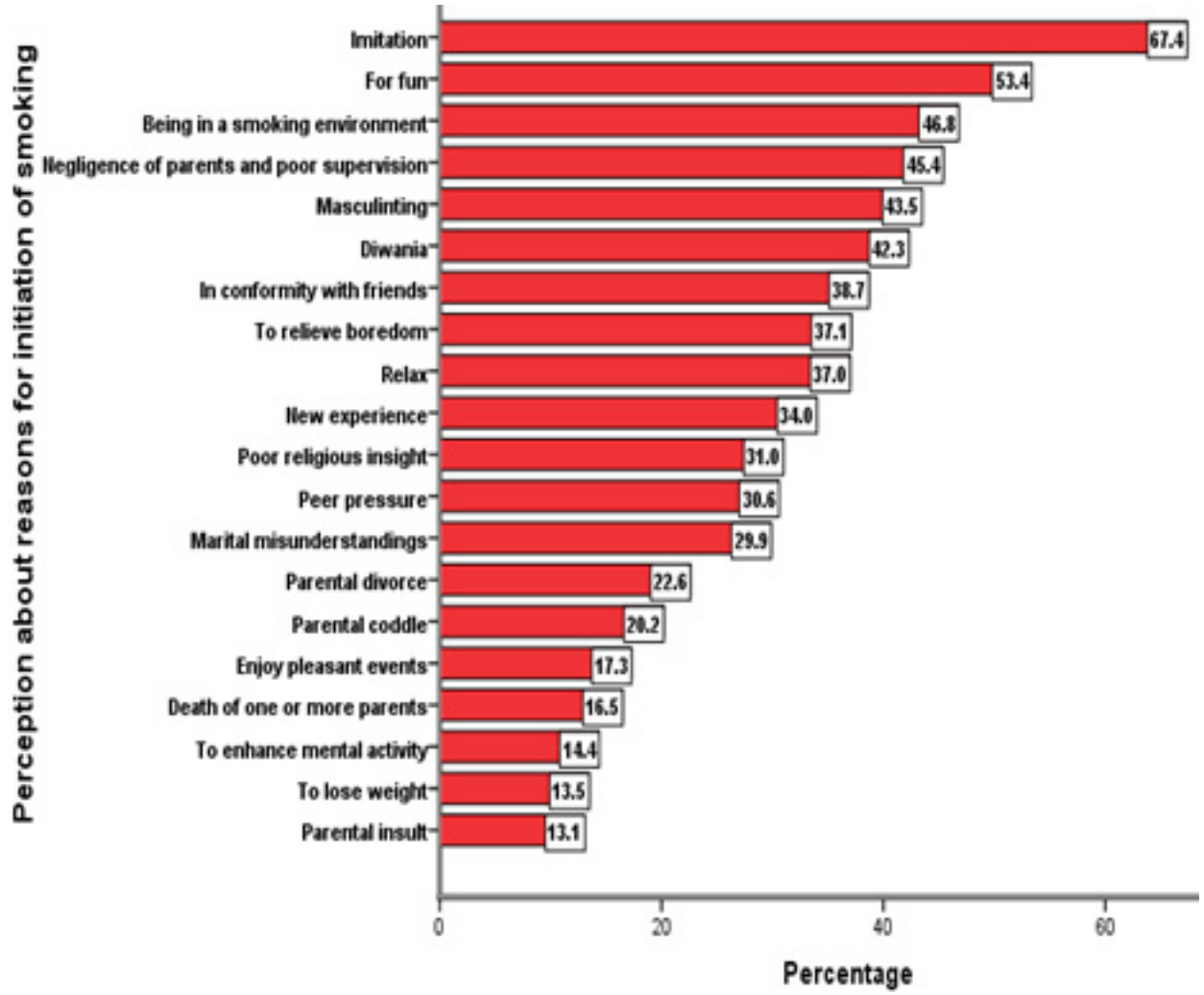

Figure 3: Perception of 2055 oil employees about the reasons for initiation of smoking

Characteristic	All (n = 2055)	Smoking status			p
		Never smoked (n=1053)	Ex-smoker (n=400)	Current smoker (n=493)	
	n	n (%)	n (%)	n (%)	
Age (in years)					**<0.001**
< 30	335	183 (58.3)	36 (11.5)	95 (30.3)	
30 – 39	599	302 (52.8)	101 (7.7)	169 (29.5)	
40 – 49	692	352 (54.2)	145 (22.3)	152 (23.4)	
≥ 50	429	216 (52.6)	118 (28.7)	77 (18.7)	
Gender					**<0.001**
Male	1639	723 (46.2)	377 (24.1)	464 (29.7)	
Female	416	330 (86.4)	23 (6.0)	29 (7.6)	
Nationality					**<0.001**
Kuwaiti	1293	599 (49.5)	226 (18.7)	384 (31.8)	
Non-Kuwaiti	772	454 (61.6)	174 (23.6)	109 (14.8)	
Marital status					**<0.001**
Single	236	140 (64.2)	22 (10.1)	56 (25.7)	
Married	1764	888 (52.9)	366 (21.8)	424 (25.3)	
Divorced	39	18 (51.4)	4 (11.4)	13 (37.1)	
Widowed	16	7 (46.7)	8 (53.3)	0 (0.0)	
Residence					**0.012**
Capital	385	197 (53.7)	64 (17.4)	106 (28.9)	
Farwania	144	73 (53.3)	34 (24.8)	30 (21.9)	
Hawali	533	282 (55.6)	84 (16.6)	141 (27.8)	
Jahra	21	12 (57.1)	4 (19.0)	5 (23.8)	
Ahmadi	732	382 (54..3)	172 (24.5)	149 (21.2)	
Mubarak Al-Kabeer	221	107 (50.7)	42 (19.9)	62 (29.4)	
Religion					**<0.001**
Muslim	1708	823 (51.4)	320 (20.0)	457 (28.6)	
Christian	144	87 (60.8)	37 (25.9)	19 (13.3)	
Others	203	143 (70.4)	43 (21.2)	17 (8.4)	
Monthly income (K.D.)					**<0.001**
< 700	132	72 (57.1)	19 (15.1)	35 (27.8)	
700-1000	100	62 (65.3)	21 (22.1)	12 (12.6)	
1001-1500	320	193 (62.1)	68 (21.9)	50 (16.1)	
> 1500	1443	726 (51.3)	292 (20.7)	396 (28.0)	
Education level					**<0.001**
High school or less	276	77 (30.8)	70 (28.0)	103 (41.2)	
Intermediate Diploma	456	212 (51.1)	84 (20.2)	119 (28.7)	
University or above	1304	764 (59.6)	246 (19.2)	271 (21.2)	

- % = Row %
- p-values were generated using Pearson's Chi-square test.
- Frequencies may not add to the total number of employees due to absences.
- Range = (Minimum, Maximum)

Table 6: Association of smoking status with socio-demographic characteristics (Part A)

Characteristic	Smoking status			p
	All (n=2055)	Never smoked (n=1053)	Ex-smoker (n=400)	Current smoker (n=493)	
	n	n (%)	n (%)	n (%)	
Physical exercise					0.158
None	457	239 (53.6)	82 (18.4)	125 (28.0)	
Light	1141	625 (56.0)	224 (20.1)	268 (24.0)	
Moderate	124	64 (52.5)	30 (24.6)	28 (23.0)	
Vigorous	267	125 (48.1)	63 (24.2)	72 (27.7)	
Number of exercise days/week					**<0.001**
None	457 (23.3)	239 (53.6)	82 (18.4)	125 (28.0)	
1-2	708 (36.2)	363 (51.3)	127 (18.0)	217 (30.7)	
3-4	482 (24.6)	275 (57.1)	111 (23.0)	96 (19.9)	
>4	311 (15.9)	176 (56.6)	80 (25.7)	55 (17.7)	
Duration of each session of practice in minutes					**0.003**
0 – 30	716	418 (58.5)	134 (18.7)	163 (22.8)	
31 – 60	627	326 (52.0)	153 (24.4)	148 (23.6)	
61 – 120	203	109 (53.7)	40 (19.7)	54 (26.6)	
> 120	38	12 (31.6)	9 (23.7)	17 (44.7)	

• % = Row %
• p-values were generated using Pearson's Chi-square test.
• Frequencies may not add to the total number of employees due to absences.
• Range = (Minimum, Maximum)

Table 6: Association of smoking status with socio-demographic characteristics (Part B)

and current smoking respectively. This discrepancy may be attributed to the variation in the target population of the two studies. The latter study was conducted on government ministries employees who may be less stressful than the population of oil workers. Also, these rates are lower than those reported by Siddiqui et al. (2001) who concluded that the prevalence of smoking in Saudi Arabia was 34.4%. Similarly, In the USA more than 20% of adults are current smokers (CDC, 2007).

A higher proportion of males were current smokers, more than females (29.7% in males versus 7.6% in females). This finding is in concert with other studies (Memon et al., 2000; Smith and Fiore, 1999) who concluded that the patterns of smoking in men and women are different; women tend to have lower rates of smoking, start smoking later than men, and consume fewer cigarettes daily. In addition, sociocultural factors, societal values and norms have a role as it may be considered indecent for females to be seen smoking cigarettes in public. Some studies (Hamilton et al., 2006; Li et al., 2003) have shown that genetic factors are responsible for a significant portion of gender differences in determination of smoking initiation and persistence. Our results showed that the mean age at initiation of smoking was 19.5 years in males and 24.8 years in females. In keeping with many studies (Moody et al., 1999; Memon et al., 2000), most males started smoking at high school, while females started at university.

Cessation of smoking

Some studies concluded that early smoking initiation has been associated with increased daily consumption of cigarettes (Khuder at al., 1999), increased length of time as a smoker (Lando et al., 1999), and decreased likelihood of quitting (Breslau and Peterson, 1996). Individuals who have experienced a stressful life or job strain have less often quit smoking (van Loon et al., 2005; Freund et al., 1992). Smoking has been consistently reported to be a coping behaviour for dealing with stress (Otten et al., 1999). van Loon et al. (2005) found an inverse association between the number of cigarettes smoked per day and smoking cessation. Therefore, individuals who started smoking at younger age (hence, have longer years of smoking), and smoke more cigarettes per day, have less often quit smoking based on the bio-behavioural model of smoking cessation and relapse (Ward et al., 1997). Successful smoking cessation was found to be associated with

Characteristic	Smoking status				p
	All (n = 2055)	Never smoked (n=1053)	Ex-smoker (n=400)	Current smoker (n=493)	
	n	n (%)	n (%)	n (%)	
Nature of job					**0.029**
On-shore	1890	974 (53.4)	382 (20.9)	470 (25.7)	
Off-shore	122	79 (65.8)	18 (15.0)	23 (19.2)	
Type of work					**< 0.001**
Office worker	1427	812 (58.7)	258 (18.7)	313 (22.6)	
Lab worker	62	35 (61.4)	14 (24.6)	8 (14.0)	
Oil-field worker	523	206 (40.7)	128 (25.3)	172 (34.0)	
Occupation					
Manager	625	364 (59.0)	127 (20.6)	126 (20.4)	**0.002**
Electrician	424	219 (54.1)	62 (15.3)	124 (30.6)	**0.002**
Power worker	327	87 (34.7)	69 (27.5)	95 (37.8)	**<0.001**
Deck worker	300	148 (46.1)	86 (26.8)	87 (27.1)	**0.002**
Materials worker	261	169 (60.6)	53 (19.0)	57 (20.4)	**0.050**
Mechanic	97	48 (60.0)	14 (17.5)	18 (22.5)	0.555
Drilling worker	83	35 (53.8)	13 (20.0)	17 (26.2)	0.986
Derrick worker	65	58 (61.7)	20 (21.3)	16 (17.0)	0.152
Do you work in a shift duty system?					**<0.001**
Yes	407	155 (39.3)	100 (25.3)	140 (35.4)	
No	1588	898 (57.9)	300 (19.3)	323 (22.8)	
Are you satisfied with your job?					**0.030**
Yes	1748	928 (54.4)	361 (21.2)	417 (24.4)	
No	247	125 (52.1)	39 (16.3)	76 (31.7)	

• % = Row %
• Frequencies may not add to the total number of employees due to absence.
• p-values were generated using Pearson's Chi-square test.

Table 7: Association of smoking status with work-related aspects

Variable		n	Adjusted Odds Ratio	95% CI	p
Gender					
Male		1639	10.5	(6.6 – 16.6)	**<0.001**
Female	(Reference)	416	1.0		
Nationality					
Kuwaiti		1293	1.9	(1.3 – 2.9)	**0.002**
Non-Kuwaiti	(Reference)	772	1.0		
Age (in years)					
< 30		335	1.1	(0.7 – 1.8)	0.770
30 – 39		599	1.6	(1.1 – 2.5)	**0.020**
40 – 49		692	1.0	(0.7 – 1.5)	0.949
≥ 50	(Reference)	429	1.0		
Religion					
Christian	(Reference)	144	1.0		
Muslim		1708	2.8	(1.6 – 5.0)	**0.001**
Others		203	2.4	(1.1 – 5.1)	**0.024**
Monthly income (K.D.)					
< 700		132	2.1	(1.1 – 4.0)	**0.027**
700-1000		100	0.8	(0.4 – 1.6)	0.485
1001-1500		320	0.9	(0.6 – 1.4)	0.681
> 1500	(Reference)	1443	1.0		
Education level					
High school or less		276	3.2	(2.0 – 5.0)	**<0.001**
Intermediate Diploma		456	1.5	(1.1 – 2.2)	**0.025**
University or above	(Reference)	1304	1.0		
Are you satisfied with your job?					
Yes	(Reference)	1748	1.0		
No		247	1.5	(1.2 – 2.1)	**0.031**

• [a]Binary logistic regression: Dependent variable (0 for never smoked; 1 for former or current smoker).
• Independent variables: socio-demographic and work-related variables.
• 95% CI = 95% confidence interval for adjusted odds ratio.

Table 8. Significant associated factors with smoking initiation using multivariate logistic regression[a]

older age (van Loon et al., 2005; Osler and Prescott, 1998), being married (Freund et al., 1992), and high income (Fernandez et al., 2001).

Initiation of smoking

Respondents of the present study reported the following reasons that motivate initiation of smoking: "imitation of friends, family members or grownups whom they admire smoke", "for fun and look cool", "negligence of parents and poor supervision", "masculising", "Diwania, a social gathering place", "to relieve boredom", "relax and alleviate stress", "poor religious insight", "peer pressure", and "marital misunderstanding". In addition, some respondents reported the following two reasons that motivate initiation of smoking: "to lose weight", and "to enhance mental activity". Regarding gender difference in motivations for smoking, most females reported: "imitation of friends, family member or grownups whom they admire smoke", "new experience", "marital misunderstanding", "parental divorce", "to lose weight". While, males reported: "to enjoy pleasant time", and "to enhance mental activity". This result is in concert with other studies (Unger and Chen, 1999; Anda et al., 1999) which reported that the most influential variables that influence the decision to start smoking were social, such as having friends, family members or people whom they admire smoke. Having a parent who smokes is a strong predictor for smoking initiation (Wilkinson et al.,2007; Hill et al., 2005, Kandel et al., 2004), while having parents who do not smoke are protective (Simon-Morton, 2004). The influence from parental smoking behaviour is strongest among the earliest initiators of smoking. Our data support the notion that parents' influence on their children's smoking behaviour follows the social learning theory which emphasizes the role that parents, family members, and peers play in modelling, reinforcing, and establishing behavioural patterns (Bandura, 1977).

Also, social and work stress have been shown to be a predictor for smoking initiation (Lloyd and Taylor, 2004; Siqueira et al., 2000). Gohlmann et al. (2009) reported that parental smoking significantly increases the offspring's hazard to start smoking. Another study (Wang and LI, 2010) revealed a considerable genetic contribution to the risk of smoking initiation in addition to environmental factors. "Friends smoking" was the top reason provided for smoking initiation (Oh et al., 2010). The second most common reason was "to look cool" (Spijkerman et al., 2005; Watson et al., 2003).

Association of smoking with socio-demographic characteristics

The present study showed significant inverse association between smoking and age. As age advances, the prevalence of smoking decreases. This relationship may be explained by the fact that older workers become more aware of the hazards of smoking on health, in particular with the presence of other disease symptoms. Also, the prevalence of smoking among males was almost 4 times that among females. Besides, the prevalence of smoking among Kuwaiti nationals was almost double that among non-Kuwaitis. This may be interpreted by the fact that Kuwaiti nationals have higher expectations than non-Kuwaitis, and they may have additional obligations towards their extended families. On the other hand, the lower level of smoking among non-Kuwaitis may be attributed to their grateful attitude towards their relatively better economic status compared to their native countries, which may differ in terms of income, working environment, and provided services.

The prevalence of smoking among divorced respondents was higher than married participants. Similarly, the prevalence of smoking was higher among the low income category respondents. Hence, the socio-demographic factors which characterize a current smoker were being young, male, Kuwaiti national, divorced, with low level of education or low income. This result is in keeping with other studies. Oh et al. (2010) reported that being young, divorced, having friends or family members who smoke, or having parents who smoke were all significantly associated with initiation of smoking. The most frequently reported reason for smoking initiation was friend smoking.

Association of smoking with work-related aspects

Our data showed that the prevalence of smoking was significantly higher among oil-field workers than office or lab workers. Managers had the least rate of smoking. Additionally, the prevalence of smoking was higher among respondents who work in a shift duty system, and among those who were not satisfied with their jobs. Hence, the significant work-related factors which characterize a current smoker were: being oil-field worker, work in a shift duty system, or not satisfied with job.

Limitations

The cross-sectional design of this study precludes any causal relationship between smoking and self-perceived demographic or work-related variables. In order to investigate issues of causality, prospective designs should be used. Another limitation of this study is that data were self-reported which may be susceptible to introduce information or recall bias. However, self-report is often a feasible strategy to gather information about employees' working conditions. Moreover, results of the study cannot be generalized to the whole population since it represents only oil industry employees.

Conclusions and Recommendations

In conclusion, this study managed to identify a number of causes that influence the initiation of smoking which can adversely affect oil employees' health and quality of work performance. Accordingly, educational programs may be organized to educate these workers about the hazards of smoking, and encourage them to practice the preventive measures which would lead to cessation of smoking. In 1995, the National Assembly of Kuwait approved a legislation for tobacco control which was

supplemented in February 2012 by a sub-clause related to restriction of smoking in public places. The articles of this law should be strictly implemented in addition to anti-smoking campaigns to promote the awareness about smoking hazards on health. In addition, regular periodic cross-sectional studies should be conducted to monitor changes in prevalence, socioeconomic and work-related determinants about initiation and cessation of smoking. These studies would provide data to organize and evaluate anti-smoking interventions.

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Overview of neonatal death at Al-Wahda Teaching Hospital in Aden, Yemen 2006 - 2008

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Abstract

Objectives: To determine the frequency of neonatal deaths over a three-year period and to identify the common causes of deaths.

Material and methods: The study was a retrospective review of neonates; from records of those admitted to the pediatric department of Al-Wahda teaching hospital in Aden, during the period 2006 - 2008.

Results: A total of 645 neonates died in the pediatric department during the study years. 61.4% were males and 38.6% females, with a ratio of males to females 1.6:1. The majority of the neonates 52.7% were full term, while 47.3% were preterm.

29.9% died within the first 24 hours after birth and (49.5%) died during the first week of life.

63.3% of neonates were of low birth weight (< 2500 grams).

The majority of neonates (65.6%) were from Aden governorate.

The major causes of neonatal deaths (46.4%) were prematurity followed by infections (29.2%) and birth asphyxia (16%).

Associations between neonatal deaths and the determinants of residence areas, birth weight, gestational age and place of birth were observed ($p < 0.05$).

48% of admitted infants died within the first day of admission and 46% died within the 2nd to 7th days.

Conclusion: We conclude that the percent of neonatal deaths increased during the three years, and the majority of neonatal deaths causes were prematurity and infections. Further studies are needed to find out the true neonatal mortality rates in our hospital and in Aden governorate.

Key words: Neonates, death, causes, Aden, Yemen

Introduction

The World Health Organization (WHO) estimates that globally four million still births and four million neonatal deaths occur each year (1-4).

Most neonatal deaths occur in low and middle income countries with half of them taking place at home (2,4). Developing countries account for around 99% of the neonatal mortality (NM) in the world, with an average neonatal mortality rate (NMR) of 33 per 1000 live births which is eight times more than that of high income countries (4 per 1000 live births) (5).

Worldwide, the most important single causes of neonatal deaths are preterm birth, birth asphyxia, sepsis and pneumonia (6,7). This reflects the mortality pattern in low income countries where neonatal mortality is high, whereas, in high income countries where mortality is low, preterm birth and congenital malformations are the leading causes of death (8).

The WHO estimates that birth weight below 2500g indirectly contributes to about 15% of the neonatal mortality, ranging from 6% in high income countries to 30% in low income countries, with preterm birth and related complications being the underlying cause (9).

Three quarters of neonatal death occur during the first week of life, while 25-45% occur in the first 24 hours after birth (10).

Arab countries vary widely in mortality rates (11). Starting with the slowest decline in Neonatal Mortality (NM), Yemen takes the first place. NM in Yemen is dropping slowly due to birth complications and maternal health, in addition to the insufficient neonatal services (12).

The objectives of the study were to determine the trend in neonatal

mortality over a three-year period and to determine the various causes of neonatal deaths among admitted neonates at Al-Wahda teaching hospital in Aden; secondly to identify the neonatal deaths related to sex, age, weight and residency and thirdly to study the associations between causes of neonatal deaths and some determinants of neonatal mortality.

Patients and Methods

This was a descriptive and retrospective study conducted in Al-Wahda Teaching Hospital, based on data obtained from the registry section of the hospital, in Aden. This hospital is a referral hospital for patients from Aden as an urban governorate and from nearby governorates which are classified as rural areas.

The data includes the neonatal admission in the years 2006 to 2008 and the records of 645 neonate deaths during the three years.

The collected data included sex, residence area, age at admission, birth weight, causes of deaths, days stay in hospital and place of delivery.

The data were analyzed and processed by using SPSS version 17 software and the results presented in descriptive and tabular forms. For variables difference, chi-square tests, and P values were calculated, with differences at the 5% level being regarded as significant.

Results

The study found, a total of 2812 neonatal admissions during the 3-years period 2006 - 2008 and the neonatal deaths were 645 (22.9%) of the total admission. The admission and the neonatal deaths increased, as shown in Table 1 and Figure 1.

Three hundred and ninety six (61.4%) neonatal deaths were males and 249 (38.6%) were females, with a ratio of males to females 1.6 : 1.

The age of the neonates at admission ranged between 0.5 hours and 600 hours, with a mean age at admission 63.7 hours ± 15.7 hours.

We added the age of the neonates at admission and the duration of hospitalization to find out the age of neonates at death.

One hundred and ninety three (29.9%) died within the first 24 hours after birth and 319 (49.5%) died during the first week of life.

The majority of the neonates, 340 (52.7%) were full term, while 305 (47.3%) were preterm.

Year	Admission	Neonatal Deaths	Percent
2006	773	156	20.2
2007	948	219	23.1
2008	1091	270	24.7
Total	2812	645	22.9

Table 1: Frequency of admissions and neonatal deaths during the years 2006 - 2008

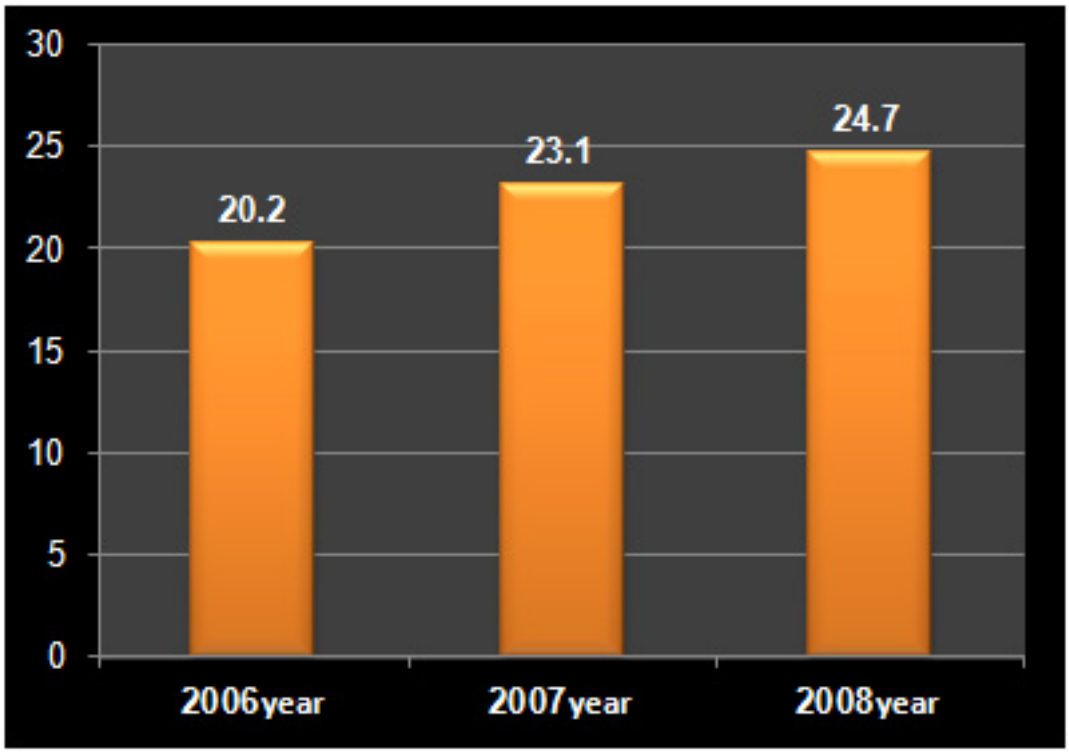

Figure 1: Frequency of neonatal deaths during the 3 years

	No	%
Sex:		
Males	396	61.4
Females	249	38.6
Gestational age at delivery:	340	52.7
Term	305	47.3
Premature		
Age at deaths (days):		
≤ 1	193	29.9
2 – 7	319	49.5
≥ 8	133	20.6
Weight (gram):		
≥ 2500	237	36.7
< 2500	408	63.3
Residency:		
Urban Aden	423	65.6
Rural	222	34.4

Table 2: Characteristics of the neonatal mortality (no = 645)

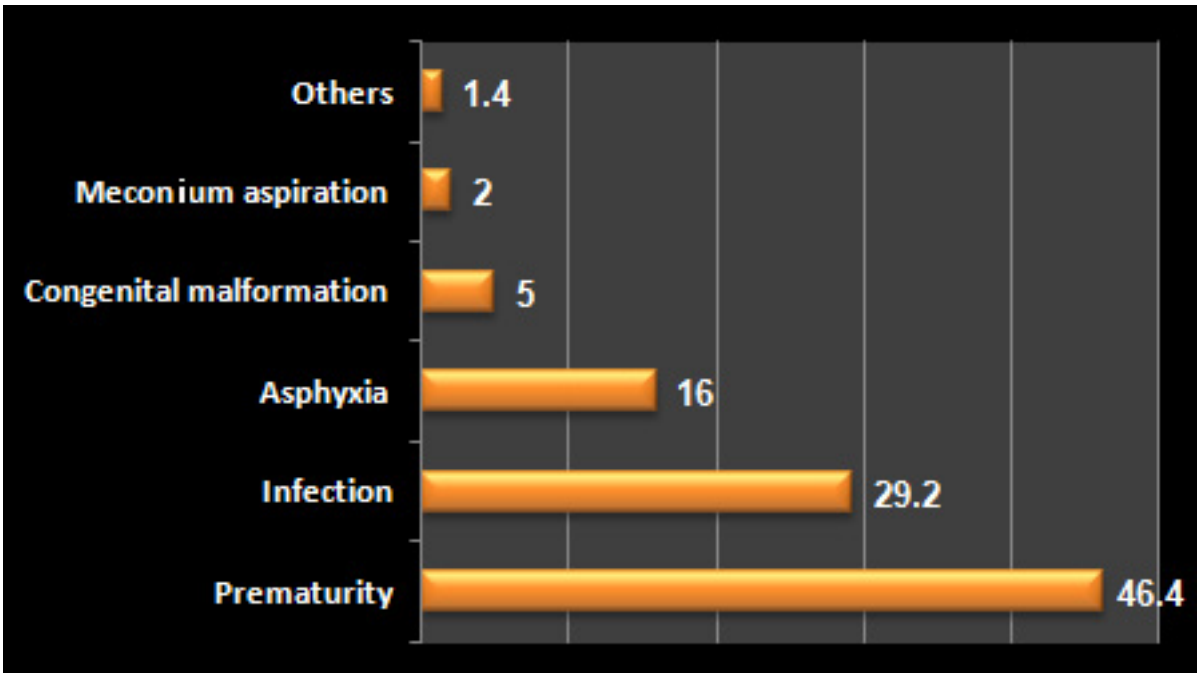

Figure 2: Frequency distribution of causes of neonatal deaths

Cause of neonatal death	Males		Females		Total	
	No	%	No	%	No	%
Prematurity (PRDS, preterm with sepsis)	185	61.9	114	38.1	299	46.4
Infection	110	58.2	79	41.8	189	29.2
Birth asphyxia	65	63.1	38	36.9	103	16
Congenital malformation	20	62.5	12	37.5	32	5
Meconium aspiration	9	69.2	4	30.8	13	2
Others	7	77.8	2	22.2	9	1.4
Total	396	61.4	249	38.6	645	100

Chi-square = 2.34 ; p = 0.800 ; PRDS = Preterm respiratory distress syndrome

Table 3: Causes of neonatal deaths related to sex

Cause of neonatal deaths	Residency		Weight (grms)		GAD		Place of delivery	
	Urban	Rural	< 2500	≥ 2500	Term	Preterm	Home	Hospital
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Prematurity	206 (68.9)	93 (31.1)	298 (99.6)	1 (0.4)	0 (0.0)	299 (100)	54 (18.1)	245 (81.9)
Infection	115 (60.8)	74 (39.2)	77 (40.7)	112 (59.3)	189 (100)	0 (0.0)	70 (37.0)	119 (63.0)
B asphyxia	72 (69.9)	31 (30.1)	13 (12.6)	90 (87.4)	102 (99)	1 (1.0)	31 (30.1)	72 (69.9)
CM	16 (50)	16 (50)	12 (37.5)	20 (62.5)	31 (96.9)	1 (3.1)	5 (15.6)	27 (84.4)
M AS	11 (84.6)	2 (15.4)	3 (23.1)	10 (76.9)	13 (100)	0 (0.0)	4 (30.8)	9 (69.2)
Others	3 (33.3)	6 (66.7)	5 (55.6)	4 (44.4)	5 (55.6)	4 (44.4)	4 (44.4)	5 (55.6)
Total	423	222	408	237	340	305	168	477
%	65.6%	34.4%	63.3%	36.7%	52.7%	47.3%	26.1%	73.9%
X^2 P-value	$X^2 = 13.9$;	$p = 0.017$	$X^2 = 344$;	$p = 0.000$	$X^2 = 628$;	$P = 0.000$	$X^2 = 26.2$;	$P = 0.000$

B asphyxia = Birth asphyxia, CM = Congenital malformation, M AS = Meconium aspiration syndrome.
GAD = Gestational age at delivery

Table 4: The associations between causes of neonatal deaths and some of their determinants

Time of death	No	%
Same day	309	48
2nd to 7th day	297	46
> 7 days	39	6
Total	**645**	**100**

Table 5: Distribution of neonatal deaths related to time of admission

The distributions of neonatal deaths by body weight were 408 (63.3%) of neonates low birth weight (less than 2500 grams) and 237 (36.7%) were normal birth weight (equal or more than 2500 grams).

The predominance of neonates were from Aden governorate (65.6%) as shown in Table 2.

Figure 2 shows that the major causes of neonatal mortality (46.4%) were preterm with their complications (respiratory distress syndrome 42.7% and sepsis 3.7%).

The second causes were infections which represented 29.2% and birth asphyxia was the third cause of death (16%).The last cause was others (Rh incompatibility, Severe anemia, severe birth trauma, and hemorrahgic diseases of newborn) with 1.4%.

We compared the causes of neonatal mortality between males and females as appears in Table 3. All causes were predominant in males.

The difference between values shows no statistical significance ($p > 0.05$).

As shown in Table 4, most causes of neonatal deaths were predominant among neonates from Urban area (Aden governorate) and the difference between values was statistically significant ($p < 0.05$).

The associations between causes of neonatal deaths and birth weight appear in the column of weight.

Infection, birth asphyxia, congenital malformation, and meconium aspiration syndrome are more common in neonates of normal birth weight (equal or more than 2500 grams).

The difference between values was statistically highly significant ($P = 0.000$).

In the column of gestational age at delivery, the causes of prematurity of infants with its complications represented the higher rate (100%).

The infections and Meconium aspiration were found only in full term death cases with 189 (100%) and 13 (100%) respectively.

The difference between values shows a statistically high significance ($p = 0.000$).

The places of deliveries of 477 (73.9%) neonates were at hospitals while 168 (26.1%) were at home.

The neonatal death causes in relation to place of delivery appeared to be more among neonates of hospital deliveries.

There was a statistically significant difference between the causes of deaths and the places of deliveries, ($p = 0.000$).

Table 5 reveals that 309 (48%) of admitted infants died within the first day of admission and 297 (46%) died within the 2nd to 7th days.

Discussion

To our knowledge, the current study is one of the rare published studies to find out the neonatal mortality and to determine the various causes of neonatal mortality in Yemen.

Paul et al (13) mentioned that one of the main public health concerns facing the world is the high rates of neonatal mortality.

Yemen takes the first place by decline in neonatal mortality. The neonatal mortality in Yemen is dropping slowly due to birth complications and maternal health, in addition to the insufficient neonatal services (12).

In the present study we found the percent of neonatal deaths increased during the three years, from 20.2% in 2006 to 23.1% in 2007 and to 24.7% in 2008.

Our finding and the slow decline of neonatal mortality in Yemen (12) could be explained by the variation of maternal health services between urban and rural areas and also between urban areas, in addition to the insufficient neonatal services in Aden.

Bhutta (14) reported in 2000 that in Pakistan, neonatal mortality has remained constant over the last two decades.

A predominance of neonatal mortality among male neonates was observed in the present study, with a ratio of male to female of 1.6:1. This finding was in agreement with other reports (15-18).

The biological factors that have been implicated with this increased risk of neonatal death in male infants includes immune deficiency which is increasing the risk of infectious disease in males (19).

It is well known that mortality rates for males in the early neonatal period are higher than those for females (20).

Lawn et al (2) reported that during the neonatal period, deaths among males are high among neonates due to the fact that girls have a biological survival advantage.

In our study we found about half of the deaths 49.5 % occurred within the first 7 days of life, while 29.9% of the deaths occurred within 24 hours of life.

Similar findings were reported by others (17, 21).

The present study showed that full term neonates were predominant (52.7%).

Preterm babies generally have a much higher risk of death than babies born at full term who are of normal size, and a risk that is 3 to 10 times higher than full term babies who were growth restricted (2). However, our finding was consistent with a study result from Nigeria reported by Onasoga et al (22).

Our study found that the total low birth weight infant deaths accounted for 63.3% of all neonatal death; preterm infants comprised about two thirds of them. A similar finding was reported in a previous study in Aden by Alkaaky (23).

The major causes of neonatal deaths in our study were prematurity (46.4%), infections (29.2%) and birth asphyxia (16%).

Sachdev (24) mentioned that the distribution of reported causes of deaths varied substantially between countries and across studies. The major direct causes of neonatal deaths globally were estimated to be infections (sepsis, pneumonia, tetanus, and diarrhoea; 35%), preterm birth (28%), and birth asphyxia (23%).

Considering these variations in regional causes of neonatal deaths we found some study results were consistent with our finding (25,26) and others varied to our results (27-29).

A prior study conducted in an Aden hospital by Yosuf (30) found that prematurity was the first leading cause of death among admitted newborns (60.5%) followed by birth asphyxia and sepsis.

Lawn et al (2) reported that globally, the main direct causes of neonatal death are estimated to be preterm birth (28%), severe infections (26%), and asphyxia (23%).

In the present study, place of residence (rural vs. urban areas) were found to be associated with causes of neonatal deaths ($p < 0.05$).

This finding differs from the prior reported observation from Yemen by Khan et al (12) that there was no rural-urban differential for neonatal mortality, in part because of the overall paucity of neonatal services, even in urban areas.

The explanation to the above variation is that urban settings have health advantages over rural ones and data from studies have shown that health indicators in poor urban areas are better than those in non-urban poor ones (31).

The study revealed significant relationships were found between causes of neonatal deaths and birth weight ($p < 0.05$). Also the gestational age at delivery was found to be significantly associated with causes of neonatal deaths ($p < 0.05$).

There was association between causes of deaths and place of delivery - home vs. hospital, ($p < 0.05$). Neonatal health can be maintained by ensuring a safe delivery because complications during delivery may cause neonatal death. Therefore, safe delivery characteristics are important, such as skilled assistance, appropriate mode of delivery and a hygienic place of delivery along with access to the appropriate level of neonatal care when needed and the place of birth can obviously affect the health of a newborn (32). The present study showed that 48% of admitted infants died within the first day of admission and 46% died within the 2nd to 7th days. These results are similar to what has previously been observed (21,29).

Conclusion

We conclude that the percent of neonatal deaths increased during the three years, and the majority of neonatal death causes were prematurity, infections and birth asphyxia.

Male neonates were predominant, and the majority of neonatal deaths were among full term and low birth weight infants.

The study was an attempt to study the frequency of neonatal deaths and the common causes of neonatal deaths. Further studies are needed to find out the true neonatal mortality rates in Aden governorate.

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