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Effects of season-induced hormonal changes on mortality  
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## From the Editor

In this issue a number of papers deal with interesting topics including hormonal changes and mortality.

A paper from Turkey looked at the Effects of season-induced hormonal changes on mortality. All hospitalized cases in their units during a 45-month period were included in the study. There were 68 deaths during the period with various causes. The total number of deaths was the highest in autumn (32.3% of all) whereas in winter it was (25.4%), 23.5% in spring, and 25.0% in the summers. The difference was statistically nonsignificant probably due to the small number of death cases ( $p=0.481$ ). The authors concluded that although seasonal differences of the human mortality rates were statistically nonsignificant, probably due to the small number of death cases of the present study, there actually may be a significant increase in autumn with unexplained reasons yet.

A cross sectional survey from Bahrain looked at Attitude and Practice of Primary Health Care Doctors towards Adolescent Health in Bahrain. A self filled questionnaire was sent to 201 participants and collected after one week by the researchers. A total of 121 participants completed the questionnaire with a response rate of 60%. More than half (53.4%) of PHCD responded that they always or often like to see adolescents. The authors concluded that PHCD in Bahrain have a positive attitude toward dealing with adolescent health. More than half see around 5-15 adolescents each day.

A cross sectional survey from Oman was conducted to determine the factors influencing the level of fast food consumption in the adolescent population in Oman. Questionnaires were handed out to 4 schools and 1 college and there were 402 respondents. It was found that income levels and level of cost did not affect the rate of fast food consumption because the statistical analysis proved that the variables were independent of each other. The authors concluded that more than one third of responders think

fast food is expensive. Girls are more calorie conscious than boys. Neither behavior nor economic factors affected the rate of fast food consumption among adolescents. It also concluded that age was indirectly proportional to the rate of future fast food consumption

A cross sectional study from Qatar looked at determinants of client's satisfaction with ambulatory care. In this study, the aim was to study the global aspects of care delivered in health centres in Qatar including GP, dentist, nurses, administration, humaneness, pharmacy and laboratory roles and structures of health centres. The authors concluded that client satisfaction is one of the indicators against which health services are judged, thereby representing an important issue for health care providers, policy makers and recipients.

A paper from Yemen attempted to determine the incidence of visible and occult blood on laryngoscopes of emergency and routine cases. Sixty-five laryngoscope blades and handles identified as ready for patient use, were observed for visible blood, and tested for occult blood in emergency and routine cases within one week. The author confirmed the presence of occult blood in the handle and blades of the laryngoscopes which could be an indicator of the potential cross infection in emergency and routine cases.

A paper from Libya looked at the Prevalence of autism among children. In 2009 the total number of children seen in Paediatrics Out-patient Department (POPD) were 12,905 out of whom 98 children were referred for ASD assessment and whose ages "ranged from younger than 3 years to 10 years of age".

The authors concluded that the prevalence of the problem is probably higher and probably similar to that seen in the USA and UK. The authors highlight the need for accurate incidence and prevalence estimates in order to adequately plan for the current and future needs of people with an ASD

thereby enabling them to maximize their potential to participate in their communities.

A paper from Iran looked at the social elements influencing the rate of crime and abnormality among the youth. The authors surveyed 200 young people living in the suburban areas of Andimeshk. The obtained results suggested that youth abnormality was considerably high in the suburban areas, with elements such as socio-economic status, religious commitment, family problems, gender, lack of cultural provisions, and facilities being paramount among variables influencing this abnormality. The results were obtained from regression analysis, then, indicated that the research independent variables served to explain 26/8% of the developments in the rate of crime, while in comparison to other variables, the variables of lack of cultural provisions and facilities held a significant voice in explaining the variables of crime and abnormality among the sample population.

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# Effects of season-induced hormonal changes on mortality

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## Abstract

**Background:** We tried to understand whether or not there are some seasonal differences in human mortality rates in the present study.

**Methods:** The study was performed in the General Internal Medicine and Hematology Clinics between March 2007 and December 2010. All hospitalized cases in these units during the 45-month period were included into the study. The total number of deaths in each season were detected and compared.

**Results:** There were 68 deaths during the period, with various causes. Although there were only three deaths in July, there were nine in October. In other words, the total number of deaths was the highest in autumn with 22 deaths (32.3% of all) in the 45-month period, totally. It was 13 (25.4%) in winter, 16 (23.5%) in spring, and 17 (25.0%) in the summer. Although there is obvious difference in the number of deaths between autumn and the other seasons, the difference was statistically nonsignificant probably due to the small number of death cases ( $p=0.481$ ).

**Conclusion:** Although seasonal differences of human mortality rates were statistically nonsignificant, this was probably due to the small number of death cases of the present study; there may actually be a significant increase in autumn with unexplained reasons yet. Relative hormonal insufficiencies during the passage from a summer-like relaxed, to an autumn-like stressful season may be one of the causes. If so, it can be prevented by some hormonal replacement therapies, thus this theory should be searched with a higher number of cases in a more detailed approach.

**Key words:** Seasons, hormonal changes, depression, mortality

## Introduction

There are some reports in the literature that many countries exhibit some seasonal changes in human mortality rates. In warm countries, it shows a U-shaped curve with higher rates during both hot and cold seasons. In Northern Europe, death rates in winter are typically between 5 to 15% greater than those in the summer (1). These increases in winter were linked to the cardiovascular, cerebrovascular, and respiratory diseases and to accidents (2). Although there is evidence about the possible physiological mechanisms of the increased mortality rates in winter (3-6), there was a report from Netherlands representing a gradual increase in mortality from the end of August to the beginning of January, and a second peak in early March (7). On the other hand, relationships between human mood and seasons are well documented, even in healthy persons. Seasonal mood changes are believed to be related with daylight. An evidence for this theory

is the effectiveness of bright-light therapy for such seasonal changes. Seasonal affective disorder (SAD) is a mood disorder in which people who have normal mental health throughout the year experience depressive symptoms in the winter or, less frequently, in the summer, spring or autumn, repeatedly, in each year. In the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV, SAD is not a unique mood disorder, but is a specifier of major depression (8). SAD is measurably present at latitudes in the Arctic region, and cloudy cover may contribute to the negative effects of it. During the attacks, patients may not feel as depressed, but rather lack energy to perform daily activities. Even some of the patients need hospitalization during the periods. We think that the SAD-like pathologies of the human body may also be important for seasonal variations in human mortality rates. Thus, we tried to understand whether or not there are some seasonal differences in human mortality rates in the present study.

## Material and methods

The study was performed in the General Internal Medicine and Hematology Clinics of the Mustafa Kemal University between March 2007 and December 2010. All hospitalized cases with any complaint, in these units were included into the study. Eventually, the total number of deaths in each season were detected and compared. Chi-Square test with one group was used as the method of statistical analysis.

## Results

The study included 1,803 hospitalized cases, totally, during the above 45-month period. There were 68 deaths during the period with various causes. Forty-three of them were males with a mean age of  $64.4 \pm 18.1$  (19-95) and 25 were females with a mean age of  $55.8 \pm 18.7$  (19-82) years. When we looked at the months for total number of deaths, although there were only three deaths in July, there were nine in October (Figure 1 - top next page).

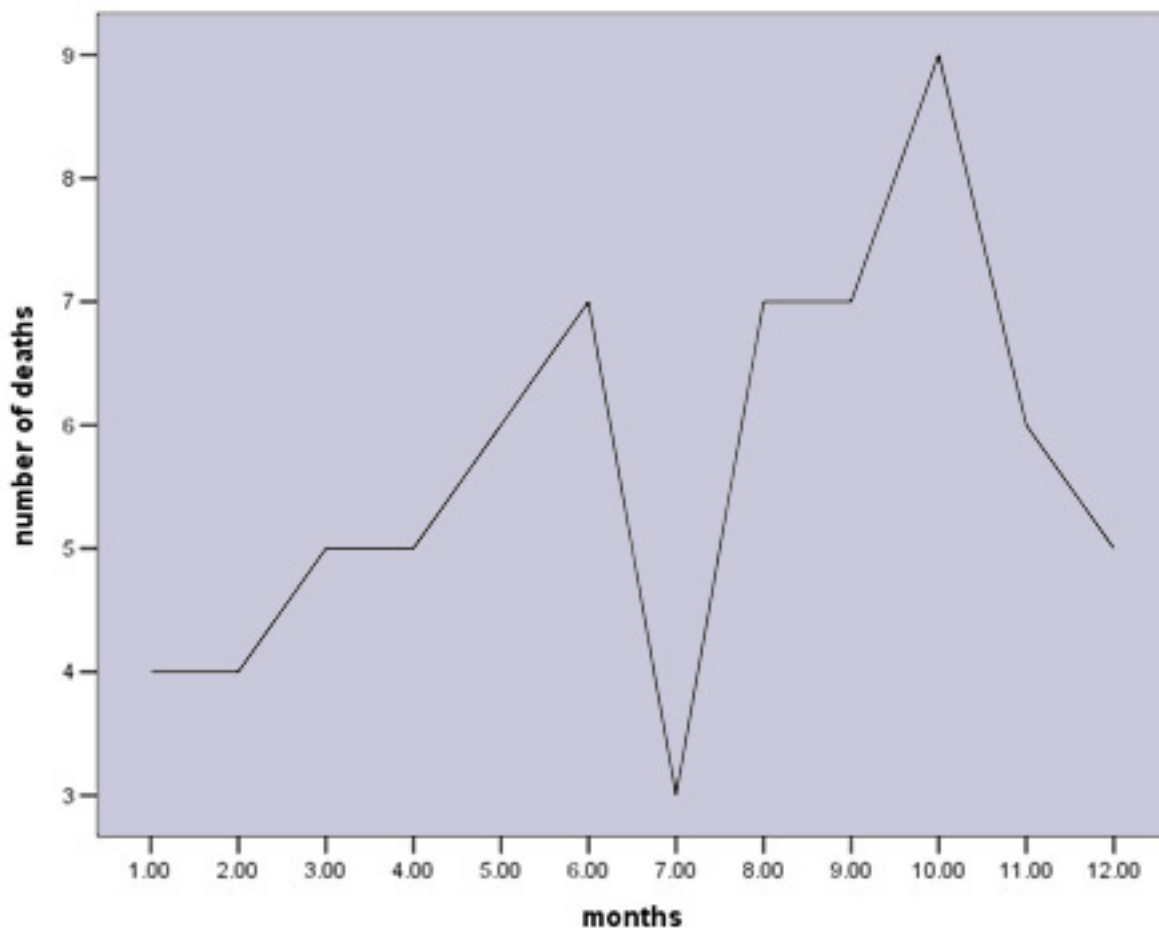


Figure 1: Number of deaths for each month

Variables	Winter	Spring	Summer	Autumn
Total months	9	12	12	12
Number of deaths	13	16	17	22
Ratio of deaths	25.4%	23.5%	25.0%	32.3%

Table 1: Number of deaths for each season

In other words, the total number of deaths was the highest in autumn with 22 deaths (32.3% of all) in four years, totally. It was 13 (25.4%) in winter, 16 (23.5%) in spring, and 17 (25.0%) in summer (Table 1). Since the study was performed in a period of 45-months in which there were three winters but four springs, four summers, and four autumns, the ratio of deaths in the winter was calculated by multiplying the number of deaths with a ratio of 4/3. Although the obvious difference of the number of deaths between autumn and the other seasons, the difference was statistically nonsignificant probably due to the small number of death cases ( $p=0.481$ ). On the other hand, nine deaths (13.2%) were due to sickle cell diseases, nine (13.2%) due to multiple myeloma, seven (10.2%) due to chronic lymphocytic leukemia, six (8.8%) due to cirrhosis, five (7.3%) due to sepsis, four (5.8%) due to acute myeloid leukemia, three (4.4%) due to breast cancer, three (4.4%) due to diffuse large B-cell lymphoma, three (4.4%) due to stroke, two (2.9%) due to other types of Non-Hodgkin's lymphomas, and two cases (2.9%) were due to prostate cancer. The remaining causes of deaths were as the following with a solitary case for each reason; Philadelphia chromosome-negative chronic myelogenous leukemia, acute infection with hepatitis B virus, T-cell lymphoma, thalassemia major, coronary heart disease, Waldenstrom's macroglobulinemia, malignant melanoma, spinal tumor, thrombotic thrombocytopenic purpura, colon cancer, adult onset Still's disease, Evans syndrome, systemic lupus erythematosus, gastric cancer, and autoimmune hemolytic anemia.

### Discussion

An understanding of the nature and causes of seasonal variation in human mortality rates may have positive effects on the health system, by demonstrating those at higher risk individuals and suggesting potentially preventable risk factors. Although the seasonal differences of the human mortality rates were statistically nonsignificant, probably due to the small number of death cases of the present study, there may actually be a significant increase in autumn with unexplained reasons yet. Autumn is a season coming just after the summer, which is a much more relaxed period of the year. Both the hot climate conditions and probable holiday advantages may provide a relatively less stressful period for the human being in their lives in the summer. For example, the smallest number of deaths were detected in July during the above 45-month follow up period in the present study. On the other hand, both the cold weather and heavy working conditions put the human being in a relatively hard period of the year in autumn. Even the yellow colors of the trees and falling of their leaves apply a pressure on the emotional status of the human being. In such a stressful condition, cortisol level, as the key hormone of body against various stresses, may fall in a level which is relatively insufficient to support the body against such stresses. There may be some roles of the other hormones in the fight of body against various stresses. While in the passage to winter, the death rates do not increase more because of the already prepared body against a stressful condition, even the rates decrease to a level which is nearly equal to the other seasons of the year. The death rates were the lowest in the spring in the present study, in which only 23.5% of all deaths

occurred during the spring. Probably, the coming summer and new plans to perform, in addition to the green leaves of the plants, put the human being in an optimal condition to live. It is not surprising that new hopes and wishes, even loves, probably increase the binding power of the human being to life, and the spring and summer are the optimal seasons for these desires. If these hypotheses are true and if there are some relative hormonal deficiencies in the human body during the passage to autumn, the increase in the number of deaths may be prevented by some hormonal replacement therapies.

Some studies have demonstrated the effects of seasons on physical fitness (9). Depending on the performance level, the changes in fitness variables may be as high as 18% from one season to another. As an explanation for the event, concentrations of physiological response variables show seasonal fluctuations. For example, cyclic seasonal variations were demonstrated for total cholesterol, dehydroepiandrosterone sulfate (DHEA-S), hemoglobin A1c (HbA1c), prolactin, and free testosterone levels (10-12). The HbA1c and DHEA-S concentrations were the highest in autumn and spring and the lowest in summer and winter in healthy women (10). In contrast, concentration of free testosterone was the highest in summer and the lowest in winter (10). Concentration of prolactin was the highest in spring and the lowest in autumn (10). The DHEA-S and prolactin exhibit immunostimulating effects (13-14). The DHEA-S and free testosterone are the anabolic hormones, whereas HbA1c is a marker for catabolic processes, and its concentration was negatively correlated with the concentrations of the anabolic hormone, DHEA-S.



The combination of low anabolic and high catabolic activities may be indicative of an increased risk of cardiovascular disease (15-16). So they have roles in response to psychosocial stresses, and seasonal changes of such physiological response variables may potentially be associated with the decreased resistance of body against infections, cancers, air pollution, cardiovascular diseases, and various other stresses and terminate with an increased mortality rate.

There may be some circadian disturbances even in the capability of reproduction, that may be subsequent to the seasonal changes (17). Melatonin may have a chief action in regulation of seasonal variation in gonadal activity. Melatonin is produced in dim light and darkness by the pineal gland, since there are direct links, via the retino-hypothalamic tract and the suprachiasmatic nucleus, between the retina and the pineal gland (17). Seasonal variation of the concentrations of gonadotropins and gonadal steroids is associated with melatonin synthesis in women (17). The number of irregular menstrual cycles with anovulation increases in winter compared to summer (17). Additionally, there is a circadian variation in the time of ovulation, occurring usually in the morning during summer and in the evening during winter (17).

As a conclusion, although seasonal differences of the human mortality rates were statistically nonsignificant, probably due to the small number of death cases of the present study, there may actually be a significant increase in autumn with unexplained reasons yet. Relative hormonal insufficiencies during the passage from a summer-like relaxed to an autumn-like stressful season may be one of the causes. If so, it can be prevented by some hormonal replacement therapies, thus this theory should be searched with higher number of cases in a more detailed approach.

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# Attitude and Practice of Primary Health Care Doctors towards Adolescent Health in Bahrain

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## Abstract

**Introduction:** Evaluation of the attitude and practice of primary health care doctors (PHCD) towards adolescents' health is essential for any improvement to the health services provided to adolescents in order to organize better health services tailored for them.

**Type of Study:** Cross-sectional survey

**Setting:** Primary Health care, Kingdom of Bahrain

**Methods and material:** A self filled questionnaire was sent to 201 participants and collected after one week by the researchers. The questionnaire included demographic, job related characteristics, attitude and practices sections.

**Results:** A total of 121 participants completed the questionnaire with a response rate of 60 %. More than half (53.4%) of PHCD responded that they always, or often, like to see adolescents. Two thirds of them (66.1%) feel always or often confident dealing with adolescent physical problems, while only 41.1% of them feel always or often confident dealing with adolescent psychosocial problems.

More than half of the participants (51.7%) stated that they see on average 5-15 adolescents in the clinic per day.

**Conclusion:** This study showed that PHCD in Bahrain have a positive attitude toward dealing with adolescent health. More than half see around 5-15 adolescents each day.

**Key words:** Adolescent health, primary health care, Attitude, Practice, Bahrain, doctors

## Introduction

WHO defined Adolescents as the age group between 10 and 19 years, and youth to be between 15 and 24 years .[1] Adolescents is an exposed diverse group; they can be in school or out of school, married or single, employed or unemployed. It is a period of rapid growth in weight and height, the appearance of sexual characteristics and ability to reproduce and in summary; it is the period of transition from childhood to adulthood.[1]

Adolescents are at an important stage in developing lifelong skills that will enable them to take good, or bad decisions about lifestyle, and assuming responsibility for their own health, learning, relationships and self-sufficiency.

The population of Bahrain is estimated to be 1,106,509 in 2008, of which 537,719 (46.6%) are Bahrainis. Among Bahrainis, the age group 10-19 constitutes 21%, while the age group 20 -24 years constitutes 9.6%. Both groups (Adolescents and youths) constitute around one third of the Bahraini population. [2]

Adolescence is considered to be one of the healthiest periods in life and therefore adolescents don't present to their family doctors frequently. Nevertheless, they face great risk for developing many of the very common and serious health problems that affect their health during adulthood. Good quality of health care provided to adolescents leads to improvement in the quality and length of life, in addition to reducing health disparities in the next stages of life. Therefore, adolescents and young adults need physician's energy, expertise, commitment, and creativity in order to help them achieve these outcomes. [3]



Health care services are not designed for young people, which makes it difficult to communicate effectively with them. Moreover, it is also not clear for doctors what are the recommendations or the guidelines for screening and prevention of health problems for adolescents as it is for adults and children. Many adolescents and health professionals feel that communication between young people and medical professionals is often highly problematic. [4] This leads doctors to give inadequate attention to adolescents, and play a great negative role and influence towards adolescents' health which leads to health problems in adulthood life.

Attitudes to adolescent health and health promotion provided to them has changed dramatically, because of the influence of new epidemiological data in several areas which show that risk behaviors such as smoking, drinking and drug use as well as sexual risk and violence coexist in high risk young people. It is also documented that the adolescent health experience can have a significant impact on the development of adult conditions. [4]

Any health behavior that is adopted by adolescents seems to continue to adulthood, even more than the behaviors adopted during childhood. [5] Therefore, health services must pay great attention to the special needs of young people if they wish to improve the emotional, psychological and physical health of the population. [6]

Although adolescents visit a primary care clinic two to three times a year in some countries, nevertheless adolescence is largely ignored by the health institutes and health professionals. [7] This could be due to their relatively low mortality and morbidity rates in comparison to other age groups. [8]

Primary care doctors usually have a wide knowledge in the health care for various groups of people. They are in an excellent position to promote adolescent health, but the challenge

they are facing is to help adolescents make healthy choices and to help the community to create healthy environments for teens. [9]

Primary care doctors are responsible for most of the health care delivered to the family (parents and children including adolescents) in Bahrain and can provide health education about health risks, teach adolescents how to make good healthy choices and encourage them to adapt lifelong healthy habits practices.

It is essential for any improvement to the health services provided to adolescents in Bahrain to evaluate the current attitude and practice of primary care doctors towards adolescents' health in order to plan the educational and training activities for them and for other health care providers.

## Methods

**Sampling units:** All the 256 Primary care doctors who were working in the governmental health centers in Bahrain during the study period were the population under study. All of them represented the study sample.

Those who were on leave during the study period, refused to participate or participated in the pilot study were excluded from the study, resulting in a total of 201 eligible candidates.

### Data Collection Methods

A structured, self administered, anonymous questionnaire was used to conduct the study. Instructions about filling the questionnaire was provided with each questionnaire and clear instructions for each question was included.

The Questionnaires were distributed to all primary health care doctors by name through the chief of medical services of primary health care. The questionnaires were then collected from each health center by the researchers after one week, through the doctor in charge of each health center.

Each questionnaire was coded for data entry and processing.

All questionnaires had special identity number for referencing.

The following items were collected for each participant:

- o Demographic (age, gender, nationality, marital status, and having teenage children)
- o Work factors (qualification, years of experience, training in adolescent health)
- o Attitude (communication with adolescents and adolescent behavior)
- o Practice (average number of adolescents seen, management and clinical exam provided to adolescents, and health advice provided to them).

### Pilot Study

A Pilot study was conducted at the beginning of the study to evaluate the data collection tool. Minor changes in the phrasing and the order of the questions were made accordingly.

### Data Processing and Analysis

Data were entered in a database program (SPSS) version 16. Frequency tables with percentages were produced for each item.

## Results

A total of 201 questionnaires were sent to participants of whom only 121 completed them, with a response rate of 60 %. Two thirds of the sample (67.2%) were female doctors. The majority of them were Bahrainis (73.6%) and 95% of them were married. Less than half (42.2%) stated that they don't have teenage children. (Table 1 - next page)

Almost half of the sample (50.2%) had 11 years or more experience in primary health care. Three quarters of them (76.7%) are Family Physician Residency Program (FPRP) graduates. More than half of them (52.1%) had no training in adolescent health, while 39.5% received training in FPRP. (Table 1)

More than half (53.4%) of primary care doctors responded that they always or often like to see adolescent patients. This is in accordance with

parameter	number	%
<b>Gender</b>		
Male	39	32.8
Female	80	67.2
<b>Nationality</b>		
Bahraini	89	73.6
Non-Bahraini	32	26.4
<b>Marital Status</b>		
Married	114	95.0
Single/divorced	6	5
<b>Age</b>	Mean= 43 years	SD= 9
<b>Having teenage children</b>		
Yes	53	42.2
No	67	55.8
<b>Years practicing in primary care</b>		
1-5	34	28.6
6-10	24	20.2
11-15	26	21.8
16-20	16	13.4
21 or more	19	16.0
<b>Residency program graduate</b>		
Yes	92	76.7
No	28	23.3
<b>Place of adolescent health training</b>		
FPRP	47	39.5
CME	8	6.7
Others	2	1.6
No training received	62	52.1

Table 1: Demographic characteristics of primary health care doctors who participated in the study, about attitude and practice towards adolescent health in Bahrain

the fact that only 35.6% of them thought that communication with adolescents is difficult. (Table 2 - top of next page)

Two thirds of primary care doctors (66.1%) feel always or often

confident dealing with adolescent physical problems, while only 41.1% of them feel always or often confident dealing with adolescent psychosocial problems. (Table 2)

A quarter of primary care doctors (25.7%) thought that there are no pleasant teenagers, while only 15 % of them thought that adolescents were always in turmoil. Just 2 (1.8%) of them believe that there is no point talking to adolescents. (Table 3)

Parameter	Always/often No (%)	Sometimes No (%)	Rarely/never No (%)
Like to see adolescent patients	64 (53.4)	51 (42.5)	5 (4.2)
Think communication with adolescent difficult	43 (35.6)	58 (47.9)	20 (16.6)
Confident dealing with adolescent physical problems	80 (66.1)	34 (28.1)	7 (5.8)
Confident dealing with adolescent psychological problems	49 (41.1)	53 (44.5)	17 (14.3)

Table 2: Attitude of Primary Health Care Doctors in Bahrain towards communication with Adolescent patients

Parameter	Agree No (%)	Disagree No (%)
No pleasant teenager	28 (25.7)	81 (74.3)
Adolescent always in turmoil	15 (15)	85 (85)
No point taking to teenager	2 (1.8)	109 (98.2)

Table 3: Attitude of Primary Health Care Doctors in Bahrain towards adolescents' behaviors

parameter	No	%
Average no. seen per day		
0-5	38	31.7
5-10	42	35.0
10-15	20	16.7
More than 15	20	16.7
Average minutes in consultation		
2-5		
5-7	14	11.7
7-10	74	61.7
More than 10	25	20.8
	7	5.8

Table 4: Practice of Primary Health Care Doctors in Bahrain in regards to average number of adolescents seen per day and average duration of consultation in the clinic

More than half of the participants (51.7%) stated that they see on average 5-15 (10-25%) adolescents out of 50-60 patients in the clinic per day. Almost three quarters (73.4%) of them affirmed that they spent on average less than 7 minutes in the

consultation, while only 5.8% spent more than 10 minutes. (Table 4)

Only 11.7 % of the primary health care physicians stated that they gave always or often, regular follow up appointments for adolescent

patients. But 58.4% of them claimed that they always or often gave health promotion to adolescent patients. Almost half of the primary health care doctors (47.5%) declared that they rarely or never measured weight and height of adolescent patients. On the



Parameter	Always/often	Sometimes	Rarely/never
	No (%)	No (%)	No (%)
Give appointment for regular follow up	14 (11.7)	70 (58.3)	36 (30)
Give health promotion	70 (58.4)	44 (36.7)	6 (5.0)
Measuring weight & height	13 (10.8)	50 (41.7)	57 (47.5)
Measuring BP	21 (18.1)	68 (58.6)	27 (23.3)

Table 5: Practice of Primary Health Care Doctors in Bahrain in regards to dealing with adolescents in the clinic

Parameter	Yes	No
	No (%)	No (%)
Smoking	117 (96.7)	4 (3.3)
Relationship with family	75 (62)	46 (38.0)
Illicit drugs	60 (49.6)	61 (50.4)
Exercise	101 (83.5)	20 (16.5)
Alcohol	42 (34.7)	79 (65.3)
Performance in school	96 (79.3)	25 (20.7)
Sexual activity	26 (21.5)	95 (78.5)
Pregnancy	15.5 (12.4)	106 (87.6)
Diet habits	96 (79.3)	25 (20.7)
Sexual transmitted diseases (STD's)	43 (35.5)	78 (64.5)
Signs & symptoms of depression	54 (44.6)	67 (55.4)
Using seat belt	23 (19.0)	98 (81.0)
Using helmet	15 (12.4)	106 (87.6)

Table 6: Practice of Primary Health Care Doctors in Bahrain in regards to addressing health and behavioral topics with adolescent in the clinic

other hand, 23.3 % of them declared that they rarely or never measured blood pressure for adolescent patients. (Table 5)

A high percentage of primary health care doctors claimed that they address the following health topics and/or behaviors with the adolescent: smoking (96.7%), exercise (83.5%), performance in school (79.3%), diet habits (79.3%), and relationship with family (62%). On the other hand, only 12.4 % of participants addressed using helmets with adolescents, 19 % addressed using seat belts, 12.4%

addressed pregnancy, and 21.5% addressed sexual activity. (Table 6)

### Discussion

Participants had a positive attitude toward dealing with adolescent health. This was not expected as a lot of previous literature found that communication between doctors and adolescents is highly problematic. [10] Participants also stated that they are confident in dealing with physical and to lesser degree psychosocial problems, of adolescents. This is a good result as it indicates an excellent base for improving the

health services for adolescents, because there is a positive relationship between positive attitude toward dealing with adolescents and screening them for risky behavior. [11]

Most of the participants appreciated the emotional changes that take place during adolescence. This was reflected by the low proportion of them that consider teenagers as non pleasant (25.7%) and as being always in turmoil (15%). This result has a positive impact on the ability of the doctors to improve and provide

better services to adolescents. Previous studies show that primary care professionals appear to find it difficult to provide good quality primary care services for their teenage patients especially those experiencing mental or emotional turmoil. [12]

Although adolescents represent almost one third of the Bahrain population [2], they represent around 10-25% of the patients seen by primary care doctors on average. This figure is similar to previous studies, which show that adolescents under-utilize primary care and even those who do receive care are under-served for their health counseling needs. [13] These disproportional figures may be due to the fact that adolescents have less physical health problems than older people. Another reason may be related to the feelings of adolescents and that doctors can't identify and respond properly to their needs in the consultation.

Primary care doctors in Bahrain are allocated 7.5 minutes for each patient, but three quarters of the responders stated that they spend less than seven minutes with adolescents. Previous surveys showed that doctors spend on average eight minutes instead of ten minutes with adolescents. [7] Previous studies showed also that consultations with adolescents are usually shorter than that for other age groups, and adolescent's medical records often contain little information. [14] This study shows a similar figure. This short time may affect the ability of the doctor to explore the health and social needs of the adolescent patient.

Although adolescent health experts recommend that adolescents should have an annual doctor visit that includes a screening interview and full physical examination, [15] only a small proportion of primary health doctors stated that they give regular appointments to adolescent patients. Moreover, almost half of them stated that they rarely measure weight and height (and hence BMI) and

a quarter rarely measure BP. This reflects deficient practice in relation to the recommended standard care of adolescent, which ultimately will lead to inadequate outcomes of the consultation in relation to adolescent health needs.

Primary care physicians have the advantage of being in an ideal setting for providing health promotion to adolescents. The majority of them claimed that they give health promotion to adolescent patients (58.4%). This figure is higher than the observed figures in other studies, which indicated that teenagers rarely receive health promotion or advice from their physician. [16] This difference may be related to the source of information, as in this study doctors were asked about what they do, while in the previous studies the adolescents were asked about whether they receive health promotion or not. This fact raises a concern about the content of health promotion given by primary care doctors and its relevance to the adolescent's need.

This was reflected in the response given by doctors regarding the topics they discussed with adolescents. A good proportion of primary care doctors claimed that they discussed with the adolescent about smoking, exercise, performance in school, diet habits and relationship with family. On the other hand, a small proportion of them do so about using helmets or seat belts, adolescent pregnancy, and sexual activity, which is similar to previous studies. [14, 16] The low proportion may reflect the sensitivity of these issues in the community in general and with adolescents in particular. Another reason could be the deficiency of training of health care workers in this field.

## Conclusion

This study showed that primary care physicians in the Kingdom of Bahrain have a positive attitude toward dealing with adolescent health. Most of the physicians are confident in dealing with physical and, to lesser degree, psychological problems of adolescents.

More than half see around 5-15 adolescents each day and they claimed that they gave them preventive health education for smoking, exercise and diet habits.

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# Determinants of Client's Satisfaction with Ambulatory Care in Qatar- A Cross Sectional Study

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## Introduction

Currently patient's evaluation of care is considered a vital indicator of clinical governance and quality improvement as seen by policy makers, practitioners and patients alike (1,2).

A systematic review conducted by Wilson and Childs has shown that the availability of a personal General Practitioner (GP), and a short waiting time is associated with increased satisfaction rates among patients (3). On the other hand, free flow of patients and administrative barriers are seen as obstacles in the delivery of quality care (4-6). Qatar, a newly developed country going through a rapid socio-economic transition has seen a transformation in the economic and health sectors leading to the establishment of 22 health centres scattered throughout the country. Health centres in Qatar differ from those in the UK and Europe by having not only groups of practicing GP's and receptionists but they also have dental services, pharmacy, laboratory, radiology (X- ray),

social workers, acute care facilities, short stay rooms, minor surgery rooms, and some have emergency departments attached to them.

Consumer satisfaction has been studied in the western literature in great depth. However, most studies targeted specific elements within the practice including length of consultation, administrative barriers (7), out of hours coverage (8), doctor-patient relationships and communication (9-11). In this study, we aim to study the global aspects of care delivered in health centres in Qatar including GP, dentist, nurses, administration, humaneness, pharmacy and laboratory roles and structures of health centres. Although studies assessing satisfaction within primary care among Arabian Gulf countries including United Arab Emirates (24), Saudi Arabia (25-26) and Kuwait (27) are abundant, satisfaction surveys in Qatar are scarce except one addressing specialized diabetic clinics at the primary health care level (28).

## Subjects and Methods

A cross-sectional survey involving four primary health care centres (PHCC) that were selected randomly during the period from January 2011 to June 2011. The health centres represented the country's central, southern, northern and western regions. The sample of subjects was collected by a systemic random method where every 10th patient arriving at the respective PHCC was approached to be included in the study. Then, a self-administered Arabic or English language questionnaire was delivered to participants aged 18 years and above. Subjects were excluded if they refused to participate, had severe mental illness or were unable to read Arabic or English languages.

The questionnaires utilized in this study consisted of a set of previously validated and reliable questionnaires (12 - 23) which were modified to suit the purpose of our study. Since the general population of Qatar is a round 1,500,000 and the expected satisfaction rate is around 50%, similar to the studies done in neighbouring countries (27) and taking confidence level of 95% and confidence interval 75%, the expected sample size was 384 and adding a 20% drop out, the expected sample size was 500 subjects.

Ethical approval for the study was obtained by the medical ethics committee at Hamad Medical Corporation research protocol number 10053/10.

The questionnaires were comprised of socio-demographic data as well as differential satisfaction with different aspects of primary care including reception, doctors, laboratory, nursing, dentist, pharmacy and the structure of the health center. For satisfaction level, each question was scored using a five-point Likert-style scale ranging from strongly agree + 2, agree + 1, don't know 0, disagree - 1 to strongly disagree - 2.

The questionnaire comprised seven sections addressing the different aspects of care and including 39 questions which took approximately 30 minutes to complete. A trained research assistant facilitated the distribution and collection of the questionnaires.

#### Data Analysis:

Data was entered into a Microsoft Excel 2003 spread sheet and fed into SPSS - version 8 for analysis. Comparative statistics were calculated using chi-squared analysis for categorical variables and one way analysis of variance for continuous variables. The level of significance was defined as  $P < 0.05$ .

#### Results

Five hundred questionnaires were distributed among the participants, and 429 of them were returned, providing a response rate of 85.8% of these 429 participants; 162 (42.5%) were males, 71.6% were office clerks, and the mean age of the participants was 38 years (S.D=11). The majority of the respondents (69.6%) declared a monthly income above 3,000 Qatari Riyals. Moreover, 89.5% of respondents were married and about two thirds of them had college educational level. Regarding past medical history; about one third of the respondents were known cases of chronic illnesses such as Diabetes Mellitus (9%), Hypertension (21.4%) and bronchial asthma (7%).

The study assessed the relationship between the respondents' satisfaction and their socio-demographic background. (Table 1). The majority of respondents were satisfied with PHCC services (74.8%) with an overall satisfaction score mean of 3.92 points out of a maximum of five points (78.4%). No overall dissatisfaction was reported. Furthermore, from the presented data, it was seen that respondents above 50 years old were significantly more satisfied than other groups with a mean score of 4.0 out of 5.0 points ( $P=0.034$ ). None of the remaining socio-demographic variables (gender, income, marital status, job, educational level) were

significantly associated with the level of satisfaction.

The study analysed the respondents' score of satisfaction regarding each PHCC provided health services (reception, physician, laboratory, nursing, dentist, pharmacy and PHCC building) and its relationship to the socio-demographic characteristics. (Table 2 - page 18). The mean overall satisfaction score was 3.93 points (78.6%). The highest satisfaction mean score was 4.32 points for nursing and the lowest was for dentist (3.57 points).

Laboratory satisfaction score means were significantly related to age ; with the subjects in the age group (31 - 40) years being significantly less satisfied with the laboratory, and those in the age group (41 - 50) being the most satisfied with it. Moreover, respondent's income was significantly related to reception and pharmacy, where the higher the income the higher the satisfaction level in both sections. There was also a significant relationship between the job of the respondents and their satisfaction mean score regarding reception, laboratory, dentist and pharmacy; with housewives having the lowest satisfaction levels in all sections, and the retired subjects being the most satisfied regarding reception, laboratory and the pharmacy, and the manual workers were most satisfied with the dentist. The final significant relationship was between educational level and satisfaction mean score regarding laboratory and pharmacy, where, roughly, the higher the education, the higher the satisfaction.

Table three (page 19) shows patients' satisfaction mean scores regarding the different aspects of physicians' services at the PHCCs. The majority of subjects were satisfied with different aspects of physicians' services. The mean overall satisfaction score was 3.92 points (78.4%). The highest satisfaction mean score was 4.05 points for the physician welcoming the patient", while the lowest being "doctor looks interested" (3.83 points). The only significant relationship noted was

between marital status and if the doctor was capable of finding the main reason for the subjects' visit ( $P=0.041$ ); that is, single respondents were the least satisfied in comparison to the other categories. The divorced subjects were the least satisfied.

#### Discussion

The present study showed that two thirds of attendees of ambulatory health services were college graduates with a high income level. This finding is similar to another study by AL Dosari et al 2008 which found that this category of patients is highly satisfied with ambulatory health services.

Furthermore, respondents above the age of 50 were significantly more satisfied than other age groups ( $P=0.034$ ). This finding is similar to studies elsewhere in the world where younger patients are less satisfied than older ones regardless of race, culture or nature of health care services (29). Reasons behind younger patient's dissatisfaction may not be captured by quantitative studies but rather by qualitative studies which will elucidate the real reasons behind the low level of satisfaction in this specific age group.

Income of patients was a significant factor with regards to satisfaction with physicians services including "welcoming the patient"  $P=0.046$  and explaining the nature of complaint ( $P=0.013$ ) i.e. as family income increased so did the level of satisfaction. This could be attributed to the fact that higher income leads to a higher level of education thereby a higher level of health satisfaction(30). Furthermore, higher income patients means that this is a productive age group especially in the Arabian Gulf region where expatriates form the majority of the population who are relatively young and as a result have few chronic health conditions which ultimately leads to a higher level of satisfaction.

An interesting finding in the present study is the high level of satisfaction among retired patients in contrast to another study done in Kuwait by (31) which showed no relationship

	Very satisfied	Satisfied	Fairly satisfied	Dissatisfied	Completely dissatisfied	Total	%	Mean score	P - value
<b>Age:</b>									
<31	10	45	8	0	0	63	30.1	3.92	0.034*
31 – 40	3	54	17	0	0	74	35.4	3.83	
41 – 50	2	35	3	0	0	40	19.2	3.94	
>50	5	24	3	0	0	32	15.3	4.00	
<b>Gender:</b>									
Male	12	79	15	0	0	106	40.8	3.96	0.724
Female	13	117	24	0	0	154	59.2	3.89	
<b>Income:</b>									
> 1000	2	22	8	0	0	32	13.7	3.82	0.367
1000 - 3000	4	31	4	0	0	39	16.7	3.93	
> 3000	16	127	20	0	0	163	69.6	3.95	
<b>Marital status:</b>									
Single	2	14	5	0	0	21	7.4	3.83	0.902
Married	26	193	38	0	0	257	90.8	3.92	
Divorced	0	1	0	0	0	1	0.4	4.27	
Widow	0	3	1	0	0	4	1.4	3.71	
<b>Job:</b>									
Manual	3	30	4	0	0	37	15.4	3.94	0.151
Office	16	136	21	0	0	173	72.1	3.93	
Retired	1	4	0	0	0	5	2.1	4.01	
Housewife	1	16	8	0	0	25	10.4	3.75	
<b>Educational level:</b>									
Illiterate	0	2	1	0	0	3	1.1	3.62	0.495
Primary	0	14	3	0	0	17	6.1	3.79	
Secondary	4	48	13	0	0	65	23.1	3.85	
College	21	149	26	0	0	196	69.7	3.95	
<b>Total</b>	<b>31</b>	<b>222</b>	<b>44</b>	<b>0</b>	<b>0</b>	<b>297</b>	<b>100</b>	<b>3.92</b>	
<b>Percentage</b>	<b>10.4</b>	<b>74.8</b>	<b>14.8</b>	<b>0</b>	<b>0</b>				

## Patient's Satisfaction

Table 1: Association between socio-demographic characteristics and overall patient satisfaction



	Reception	Physician	Laboratory	Nursing	Dentist	Pharmacy	Health C.
<b>Age:</b>							
< 31	3.70	3.91	4.09	3.93	3.42	4.39	4.06
31 - 40	3.49	3.86	3.90	3.83	3.48	4.29	3.92
41 - 50	3.62	3.93	4.17	4.06	3.52	4.30	3.99
> 50	3.57	3.98	4.05	3.96	3.71	4.30	3.91
<b>significance</b>	<b>0.325</b>	<b>0.800</b>	<b>0.019*</b>	<b>0.085</b>	<b>0.163</b>	<b>0.629</b>	<b>0.200</b>
<b>Gender:</b>							
Male	3.67	3.88	4.13	4.31	3.53	4.03	4.04
Female	3.58	3.94	4.02	4.34	3.57	3.91	3.99
<b>significance</b>	<b>0.267</b>	<b>0.387</b>	<b>0.056</b>	<b>0.529</b>	<b>0.594</b>	<b>0.055</b>	<b>0.354</b>
<b>Income:</b>							
> 1000	3.32	3.90	3.90	4.40	3.46	3.73	3.99
1000 - 3000	3.63	3.89	4.06	4.35	3.69	3.94	4.07
> 3000	3.64	3.94	4.11	4.29	3.56	4.01	4.01
<b>significance</b>	<b>0.046*</b>	<b>0.874</b>	<b>0.076</b>	<b>0.379</b>	<b>0.381</b>	<b>0.013*</b>	<b>0.722</b>
<b>Marital status:</b>							
Single	3.50	3.83	3.86	4.22	3.58	3.85	3.98
Married	3.63	3.92	4.07	4.32	3.56	3.97	4.01
Divorced	4.40	5.00	4.50	5.00	3.50	3.20	4.43
Widow	3.20	3.97	4.20	4.28	3.60	3.83	4.02
<b>significance</b>	<b>0.191</b>	<b>0.098</b>	<b>0.131</b>	<b>0.241</b>	<b>0.997</b>	<b>0.341</b>	<b>0.689</b>
<b>Job:</b>							
Manual	3.58	3.99	4.09	4.23	3.84	3.89	4.06
Office	3.63	3.88	4.10	4.31	3.52	4.00	4.01
Retired	4.11	3.86	4.14	4.14	3.60	4.26	4.08
Housewife	3.23	3.81	3.76	4.46	3.35	3.63	3.92
<b>Significance</b>	<b>0.011*</b>	<b>0.620</b>	<b>0.010*</b>	<b>0.239</b>	<b>0.005*</b>	<b>0.002*</b>	<b>0.607</b>
<b>Educational level:</b>							
Illiterate	2.95	3.81	3.95	4.40	4.05	3.35	3.75
Primary	3.42	3.96	3.85	4.26	3.56	3.80	3.87
Secondary	3.53	3.95	3.92	4.35	3.56	3.82	4.01
College	3.65	3.92	4.11	4.30	3.55	4.01	4.02
<b>Significance</b>	<b>0.118</b>	<b>0.967</b>	<b>0.012*</b>	<b>0.854</b>	<b>0.539</b>	<b>0.005*</b>	<b>0.380</b>
<b>Mean score</b>	<b>3.63</b>	<b>3.93</b>	<b>4.06</b>	<b>4.32</b>	<b>3.57</b>	<b>3.97</b>	<b>4.02</b>

Table 2: Patients' satisfaction score with different aspects of primary health care services

	Welcomed the patient	Finding reason for the visit	Doctor interest	Patient involved in decision	Time adequacy	Explain nature of symptoms	Explain purpose of labs & treatment
<b>Age:</b>							
< 31	4.07	3.99	3.76	3.87	3.99	3.79	3.83
31 – 40	4.05	3.91	3.67	3.74	3.98	3.84	3.75
41 – 50	4.06	3.99	3.89	3.88	3.88	3.90	3.86
> 50	4.02	4.14	3.96	3.95	4.05	3.91	3.81
<b>significance</b>	<b>0.988</b>	<b>0.429</b>	<b>0.311</b>	<b>0.471</b>	<b>0.702</b>	<b>0.826</b>	<b>0.841</b>

Table 3: Patients' satisfaction score with physician's services

between age category and satisfaction. The majority of elderly subjects in Qatar are composed of Qatari Nationals whereas the expatriate group represents young workers. Elderly Qatari Nationals enjoy free health services, better housing, strong family ties and support from extended families and the majority of them have personal helpers at their disposal whereby their needs are constantly being met including medicine administration and accompanying them to their respective health centers.

In the present study satisfaction with "nursing sections" was highest among the different services including doctors, receptionists, laboratory and dentists.

Reasons behind this high satisfaction may be due to enhanced communication skills that nurses acquire during their training, longer time of contact, and the use of non medical jargon.

In contrast, "dentist" services scored the lowest in the present study which could be attributed to many factors including, higher anxiety, longer waiting times (32) where patients are scheduled every 20 minutes which leaves some patients not having their treatment fully accomplished. Dentists in Qatar often do not explain the nature of the procedure they are performing and do not use pain score charts in explaining and or assessing the severity of pain to their patients. Furthermore, the amount of anesthesia given to patients may not be adequate for certain procedures including tooth extraction and "the dentist phobia" which is perceived as a painful experience by many patients may all lead to lower satisfaction levels with dental services.

With regards to satisfaction with "doctors" services "welcoming the patients" and "explaining the nature of my illness" had the highest score. This could be attributed to many factors including family physicians demonstrating high communication skills which are mandatory during their vocational training, familiarity of patients with their family doctors,

easy access and continuity of care all of which lead to further consolidation of the doctor - patient relationship which is the core element in ambulatory health services.

In contrast the item "doctor was interested in me as a person" showed the least satisfaction level which could be attributed to the busy nature of ambulatory health services having very little time for consultation, competing demands, doctors burnout, lack of incentives, lack of job satisfaction (33), and masked or unrecognized depression among health care workers including doctors.

In the present study, educational level was highly associated with satisfaction which could be attributed to many factors. Firstly, higher education means enhanced awareness about health related issues, engagement in healthy lifestyle and preventive measures.

This point of view is consolidated by a study carried out by (34) which found that less educated patients were less likely to be engaged in health screening activities, nutritional counselling and physical examination.

## Conclusion

Client satisfaction is one of the indicators against which health services are judged by, thereby representing an important issue for health care providers, policy makers and recipients.

Furthermore, client satisfaction will serve as a valuable auditing tool whereby health care providers can get vital information about their weaknesses and strengths, and as a result improve the health service. Our survey showed that although overall satisfaction was high, certain aspects of ambulatory health care services need addressing, including dental services, and the length of consultation.

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# A study on the social elements influencing the rate of crime and abnormality among the youth. (The case of the suburbs of the southern city of Andimeshk, Ahvaz Province, Iran)

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## Abstract

This paper seeks to explore the social elements which influence the tendency of the suburban youths of Andimeshk city toward social abnormality. Drawing upon theories as diverse as social disorganization, pressure, social control, and differential association, this study focused on its ultimate goal: exploring the social elements which prove themselves significant in influencing the rate of crime and abnormality among the suburban youth of the city under study. Survey study was adopted as the research method, and some 200 young people living in the suburban areas of Andimeshk were sampled to be investigated.

The obtained results suggested that youth abnormality was considerably high in the suburban areas, with elements such as socio-economic status, religious

commitment, family problems, gender, lack of cultural provisions, and facilities being paramount among variables touching this abnormality.

Research findings also pointed to the fact that there was a reverse correlation between the rate of abnormality and crime and variables including religious commitment, lack of cultural provisions, and facilities. The research also reported a positive and direct relationship between the rate of crime and the variable of social belonging. It was observed that there was not a significant relationship between the variable of family problems and crime. The difference in the average of crime and abnormality between the male and female participants was significant. The results obtained from regression analysis, then, indicated that the research

independent variables served to explain 26/8% of the developments in the rate of crime, while in comparison to other variables, the variables of lack of cultural provisions and facilities held a significant voice in explaining the variables of crime and abnormality among the sample population.

**Keywords:** Social belonging, religious commitment, family problems, social abnormality, crime, suburban areas, lack of cultural provisions, facilities.

## Introduction

Scholars agree that norms are rules of human relationships, which constitute the basis of social order. The agreement upon this rule is related to the development of order and stability in each society. Social norms, then, are concrete guidelines of social values that are introduced by society to build social order, and to adopt social values." Norms are rules to be applied as the common paradigm of social action; and violation from them will be punished."(Abercrombie, 1978:259) In other words, norms are humane, conventional causes which are built based on social values; societies create order by considering them, and they are indicators on which to judge peoples' behaviors. Behaviors which go hand in hand with them, therefore, will be classified as "normal", and behaviors which take issue with them, accordingly, are described as "abnormal".

While norms being the basis of social order, they do not hold the same extent of significance for society, and society, for its part, does not react to violations from them in the same manner. Some of these norms have been developed by peoples' awareness of the significant institutions of society (e.g., the governmental and religious ones), which are called "the institutionalized norms", so if they are violated, society will put a harsh reaction on the agenda. On the other hand, norms are behaviours which have evolved during time from the context of society and are called "the non-institutionalized norms" including: social customs, conventions, and traditions; however, once these norms are violated, one ought not to expect so harsh a reaction from the side of society as is the case with the former norms. Abnormality is any action which goes against the received norms of society, and the scholars seek to investigate the abnormalities which are denounced by the majority of society. To put it differently, they tend to study the abnormalities that are regarded as guilty by most of the people. Hence, each norm contains two central elements consisting of action and

violating the received norms of society. Sociologically speaking, abnormality comes to mind as a relative concept; that is, an act is abnormal which is agreed upon as abnormal by the majority, while this act might be understood as normal in another context. It is why one should not be surprised at knowing the fact that the concept of abnormality has come to mean many things in different times and across different societies, so much so that one is left to wonder what abnormality is not.

In another perspective, then, abnormality has been grasped as a behavior which violates the received norms of any society. In different situations, people are expected to display context-specific behaviors, lest be labeled as "abnormal", and not taking heed of such expectations comes to mean "abnormality".

The current paper takes the pain of measuring the rate of deviance from norms and also exploring the elements influencing it. Having this in mind that norms play an essential role in society, the primary research question was derived as following: "To what extent is society abnormal? And why?"

### The importance of this study:

It is taken for granted that the primary emphasis of the urban sociologists rests on urban regionalism, and then there is a shift in their focus to the characteristics of each region and their influences on social life as a whole. Where each region has its own kinds of abnormalities, the suburban areas, to be understood as regions with the highest rates of abnormalities and social deviations, draw a considerable amount of attention from these scholars. Living in the suburban settlements reminds us of inhabiting the illegal lands which pertain to the municipalities or the Ministry of Housing and Urbanization. But their miseries should not be reduced to limited access to housing and urban services, rather, such settlers are characterized by living a life of lowest standards in slums.

Berges argues that although mobilization and increasing

incentives in cities entail ethical tensions, as stability and adaption are central to guarantee ethics. Ethical decadence and increased crimes in slums can be credited to increased mobilization and lack of appropriate control from the side of the authorities.

The suburban areas and their youth residents are the cause of establishing mass cities, on the other hand, they are said to be the origin of mass community, which are populated by the lower classes whose grassroots abuse the elites and spur social crises. Among the vast array of the authentic works which have been made available by the classical scholars to deal with the lousy, abnormal lives lived in such suburban areas, one can refer to the following: "Corner ville man", "Grassroots", and "Marginal man".

These are identified by perennial features such as: dense residential spaces, inappropriate streets and alleys, diverse ethnic groups, an increasing population of immigrants, youths with low education levels, lamentable sanitary facilities, and lower social cohesion, the suburban areas are believed to highly contribute to an unfolding disturbance in the process of socialization, participation in community, indifference, and distrust. All these, then, hold cards which unanimously bear a single slogan: provoking social abnormalities.

A currently chronic social crisis across the Iranian society, and the spread of these abnormalities will tend to become a national crisis in the years down the road. In this situation, one is left to wonder whether the suburban settlements merely offer imbalance to the landscape of the cities, or their influences go far beyond what has been understood by now. Given that such populations mainly stem from the immigrants from the rural areas, the suburban areas have become battlefields where a full-scale tension is progressively on the rise between the characteristics of the former rural settlements and the newly adopted urban setting.

A theory unfolds that developments in the spatial construction on any city are contingent upon preferences of the higher classes, in that they are aggregated at the central parts of cities with the lower classes being gradually repulsed from the center. Put differently, due to having freer access to financial sources, the higher classes invest a whole lot in transportation and purchasing the central lands, and in doing so, they unceasingly put the burden of their preferences on the feeble shoulders of the lower classes of society. Others capture the cause of this crisis well when they observe that due to lack of financial sources to be put into transportation sector, the low-paid population cannot take as much distance from their workplace, to remain in the central parts of cities and pay most of their currently low income on their rental houses. Here Engels is right to stand against the capitalistic system by ascribing the urban miseries and adversities to this greedy phenomenon. (p.131) Both the rates of crimes and the theoretical frameworks of sociology well serve to indicate that such areas increasingly contribute to social abnormalities. Therefore, exploring the types and rates of crimes in these settlements which are mostly home for the immigrant youth, can be an appropriate tool to measure the development of abnormalities throughout society, and such studies may recommend remedies to make a difference in the status quo.

### Theoretical Perspective

The main theoretical approach to be adopted in this study was structural approach for explaining abnormality. This umbrella approach covers the theories of social disorganization, pressure, and cultural deviation with the theories of disorganization and pressure being of paramount importance. These theories of social order unanimously argue that cohesion results in conformity and lack of cohesion, then, brings social deviance and abnormality. A cohesive social system is one which holds an internal unity based on norms and values; such a system is also characterized by a strong association among the members,

and their interactions take place on a regular basis. In contrast, an abnormal or disorganized social system is one in which there is a failure in social cohesion and control”(Akers, 2000:159).

One is capable of tracking three similarities among these theories: firstly, these theories observe that the rate of abnormality and crime won't rise unless there is a decreasing trend in cohesion and unity across society or community; secondly, these theories lend themselves to explaining the high rates of abnormality and crime within the lower classes or ethnic groups of society; and thirdly, they are focused on crime and sub-cultures (ibid).

Having been primarily introduced in urban delinquency research, the theory of social disorganization was developed by the sociologists of the University of Chicago, and it took some time to be adopted as a pattern in investigating urban abnormalities in Shaw and MacKay's works.

Shaw and MacKay reported a considerable relationship between the patterns of urban life and the rate of crime in their theory; however, this relationship was not of a clear-cut nature as such. It was not until 1989 when Sampson and Groves developed their model for measuring social disorganization, in which the palpable relationship between social disorganization and social deviance and abnormality could be evaluated. In this model, therefore, neighborhood associations, lower socio-economic states, higher spatial mobilization, ethnic variety, and family dissociation joined hands to make grounds for establishing low friendship networks and uncontrolled youth across the neighborhood, and all these were illustrated as contributing to increased neighborhood crimes (Sun et al, 2004:1). This theory was then verified by scholars like Veysey and Messner (2004), Lowenkamp et al (2003), and Sun et al (2004). The model developed by Sampson and Groves dominated other theories in terms of its clarity in theory and methodological issues. They had

evaluated crime and deviance through taking advantage of self-report and direct/indirect influences of disorganization on crime.

Theory of pressure is based on the theory of Merton, which is also informed by Durkheim's anomie theory. It argues that a gap between the received goals and tools makes grounds for the development of abnormality. Supporting the work of Merton, Albert Cohen continued his work through laying more emphasis on the structural sources of pressure, which in turn, result in deviance, but he studies them as sub-cultures. Cohen believed that failure in obtaining material accomplishments, higher positions, and social acceptance brings forth this type of pressure. He implies that when the youths of the lower social classes fail to meet the high expectations set by the middle classes in their schools, they will become subject to positional deprivation and insufficiency, and this "criminal sub-culture" is characterized as a collective response to such insufficiency and deprivation. (Akers, 2000:167)

Under the strong influence of Merton's theory of anomie, Cohen's criminal sub-cultures, Shaw and Mackay's theory of social disorganization, and Sutherland's theory of differential association, Coulward and Ouhlin developed a novel version of the theory of social pressure, called "differential opportunity and criminal sub-culture". They offered interesting insights into the fact that "being deprived from the legitimate tools results in a propensity toward delinquent actions". (ibid) Unlike the theory of Cohen, then, they observed that the illegitimate opportunities have not been distributed equally everywhere. Rather, such opportunities are under the influence of social organization and neighborhood associations. "To them, the distribution of these illegitimate opportunities has an extended hand in determining the context of criminal sub-cultures". (Mohseni, 2004:88)

The present study did not suffice to the above-mentioned structural



theories, and also made considerable use of Hirschi's theory of social control. Travis Hirschi argues that abnormality is an immediate offspring of one's failure in his/her sense of belonging to society, which comes from the very social control. "Being strongly loyal to the ethical codes and values of society" Hirschi declares, "decreases the risk of contributing to delinquent and abnormal behaviors. Those who hold a fragile loyalty to the ethical codes of society are more apt to shut their eyes to considering these values, and are more readily engaging in delinquent and deviant behaviors". (Amanat, 1994:99)

A scholar who is drawing heavily upon the theory of Shaw and Mackay, Sutherland points out that such deviant behaviors are learnt through association and relation with others during one's life span."To put it in a nutshell, Sutherland's theory observes that like other social behaviors, these abnormal behaviors are internalized through association and relation with others. The criminals, for instance, acquire their delinquent attitudes and propensities through association with other criminals. The more one is exposed to association with the criminals, the higher the chance of his/her active engagement in such criminal behaviors." (Mohseni, 2004:100) All this was to say that the present study attributed abnormality to the following variables: low socio-economic states, fragile loyalties to the ethical codes and values of society-which are here envisioned in the form of "religiosity"-, insufficient social control, family problems, and association with the abnormal individuals.

### Method

The very nature of the present study and its declared aims all joined hands to require the use of survey study. Generally speaking, survey study is more a research procedure than a method; however, one is allowed to incorporate several methods in this type of study. Some 200 youth were recruited through applying Cochran formula to form our study population.

Due to the study's sample, its size, and the very nature of the study, the questionnaire was decided to fit as a tool for data collection process. In order to measure the validity of the questionnaire, use was made of face validity, and Cronbach's alpha was also decided to be the most appropriate tool in measuring the reliability of the questions and items of the questionnaire. In taking the first step of our study, some 40 pilot questionnaires were distributed among the participants, to gather the needed data for measuring the validity and reliability of our data collection tool. Table 1 presents the coefficients of Cronbach's alpha for the variables of this study:

The study adopted the measures of attitude toward abnormality and pride in abnormality to measure the dependent variable of the rate of abnormality and crime. Being also called the "measure of criminal attitudes" and "pride in delinquency scale", these measures have been central to fulfilling numerous criminal studies." Alongside an obvious theoretical connection between attitude toward crime and criminal actions, a plethora of empirical studies serve well in affirming this connection". (Simourd, 1999:91) Hence, the study at first set off to identify the attitudes of the sample toward social abnormalities, and then went on to measure the rate of abnormal actions in individuals.

According to the theoretical and empirical presumptions, the correlation between one's attitude toward abnormal acts and practicing these acts was 0/95. Cronbach's alpha for the total validity of these two indicators in measuring abnormality was 0/74. The variable of family problems encompassed abnormal acts raging from simple skirmishes and struggle to beating and leaving home. To measure religiosity, we used the indicator of Glog and Stark which proves itself the most appropriate indicator for such cases. (Serajzadeh, 2004)

In a deliberate manner to fulfill the aims of our study, a suitable analytical framework was developed

out of the mentioned theories, which contained both the dependent and independent variables. Then, following the process of formulating the research hypotheses and questions based on a theoretical pattern, a methodological causal model was formed; the dependent and independent variables were characterized; subsequent to measuring the validity and reliability of the research questionnaire, data were collected from the study population; and finally, use was made of SPSS to analyze the collected data, and this was done in relation to the level of analysis for each variable and consistent with the related statistical suppositions. The study population was comprised of the 15-to-29 age cohort individuals living in the suburban areas of Andimesh city. Mixed sampling was adopted as a way to promote the efficiency of the process of sampling. This sampling method is considered to be a multiple one, which is generated from integrating several methods to increase the coefficient of accuracy. And one is able to apply multiple methods in fulfilling this process. (Sarukhani, 1998:116) This study depended on applying random and multistage cluster sampling. In this type of sampling, the constructive units of the study sample are clusters of the individuals, where instead of observing and monitoring the whole participants from the selected clusters, just a sample of such individuals is selected for final observation. (Saraee, 1993:20)

Accordingly, the hypotheses entertained in this study were:

1. There is a relationship between the sense of social belonging and the rate of suburban youth abnormality and crime;
2. There is a relationship between religious commitment and the rate of suburban youth abnormality and crime;
3. There is a relationship between family problems and the rate of suburban youth abnormality and crime;
4. There is a relationship between lack of cultural provisions and the rate of suburban youth

Variables	Items	Cronbach's Alpha Coefficient
Social belonging	16	0/60
Religious obligations	7	0/60
Family problems	7	0/52
Cultural provisions	4	0/91
Facilities	9	0/73
The rate of crime (abnormality)	20	0/74

Table 1: Items and the coefficients of Cronbach's alpha for the independent and dependent variables

The rate of crime	Frequency	Percentage
Very low	16	8/2
Low	18	9/2
Mean	53	27/2
High	98	50/3
Very high	10	5/1
Total	195	100

Table 2: The rate of crime and abnormality among the suburban youth

Independent variables	t-value	Significance	Outcome
Social belonging	0/167	0/022	Direct and positive correlation
Religious obligations	-0/175	0/016	Reverse and negative correlation
Family problems	-0/007	0/926	Lack of correlation
Lack of cultural provisions	-0/442	0/000	Reverse and negative correlation
Lack of facilities	-0/385	0/000	Reverse and negative correlation
Income (socio-economic status)	0/326	0/002	Direct and positive correlation
Number of family members	-0/196	0/006	Reverse and negative correlation
Gender	3/01	0/003	Significant difference

Table 3: Correlation between the independent variables and the rate of youth abnormality

Independent variables	Regression coefficient	SE	β coefficient	t-Test	Significance
Constant	55/151	8/332	-	6/619	0/000
Social belonging	0/099	0/094	0/074	1/047	0/297
Religious obligations	-0/160	0/169	-0/069	-0/945	0/346
Family problems	0/134	0/202	0/048	0/662	0/509
Cultural provisions	-0/605	0/180	-0/269	-3/358	0/001
Facilities	-0/433	0/147	-0/229	-2/942	0/004
Gender	-1/319	1/256	-0/075	-1/050	0/295
		Sig=0/000	F=5/944	R <sup>2</sup> =0/268	R=0/518

Table 4: Regression coefficients of the independent variables and the rate of social crime

- abnormality and crime;
- 4. There is a relationship between lack of cultural provisions and the rate of suburban youth abnormality and crime;
- 5. There is a relationship between facilities and the rate of suburban youth abnormality and crime; and,

- 6. The boys' rate of abnormality and crime is higher as opposed to the girls.

**Results**

To begin, the research findings revealed that 50/3% of the studied youth had a high rate of social

abnormality and crime, and this figure was followed by 27% as mean, 9/2% as low, 8/2% as very low, and 5/1% as very high. So, the rate of youth abnormality has been high.

The results obtained served to show that there was a negative and reverse correlation between

the rate of abnormality and crime and the variables of religious commitment, family problems, lack of cultural provisions, and facilities. There was, however, a positive and direct relationship between the rate of abnormality and crime and the variables of income and social belonging. It was also decided that there was not a significant relationship between family problems and the rate of abnormality and crime. A significant difference was as well discovered between the means of crime for girls and boys. The results hinted that as opposed to the girl participants (30/7), the boy participants (34/1) of this study were more inclined to abnormality and crime.

The regression analysis allowed the study to presage the changes of the dependent variable through the independent variables, and to decide how much each independent variable was capable of explaining the dependent variable. The enter method was used to analyze the collected data. It was conceived from the results of regression analysis that the value of the multiple correlation coefficient was 0/518,

and a high correlation was revealed between the dependent variable of the rate of abnormality and crime and the independent variables. The coefficient of determination, then, was 0/268. That is, the independent variables were capable of explaining 26/8% of the changes that occurred in the dependent variable, and the remaining 73/2% of the observed changes were ascribed to other elements. The test of variance analysis showed that the independent variables had afforded predicting most of the felt changes in the rate of social abnormality and crime.

In comparison to other variables, the variables of lack of cultural provisions and facilities proved more efficient in explaining the rate of social abnormality and crime. As it was understood from the value of test and level of significance, these variables held a significant relationship with the rate of social abnormality and crime. According to the beta coefficients obtained from the path analysis, the values of the independent variables' direct, indirect, and total influence on the dependent variable were -0/48, -0/32, and -0/80, respectively.

Through cutting across the results shown above, the following points can be derived:

1. Once a young person's sense of belonging to society increases, s/he will become more apt to engage in abnormal behaviors. It is also worth noting that by decreasing this sense of belonging, one's inclination toward engagement in such abnormalities decreases accordingly. It was to indicate that individuals characterized with limited social contacts tend to become more secluded. In other words, those who have lower levels of social belonging tend to become actively engaged in abnormal and criminal acts.
2. There was a relatively low and negative relationship between religious commitments and the rate of social abnormality and crime. That is to say, by decreasing the level of religious commitment, the rate of crime would rise. As the social control theory of Hirschi well put it, it is "social contact" which prevents the youth from engaging in delinquent behaviors. According to Hirschi there are four elements that generate these social contacts: attachment,

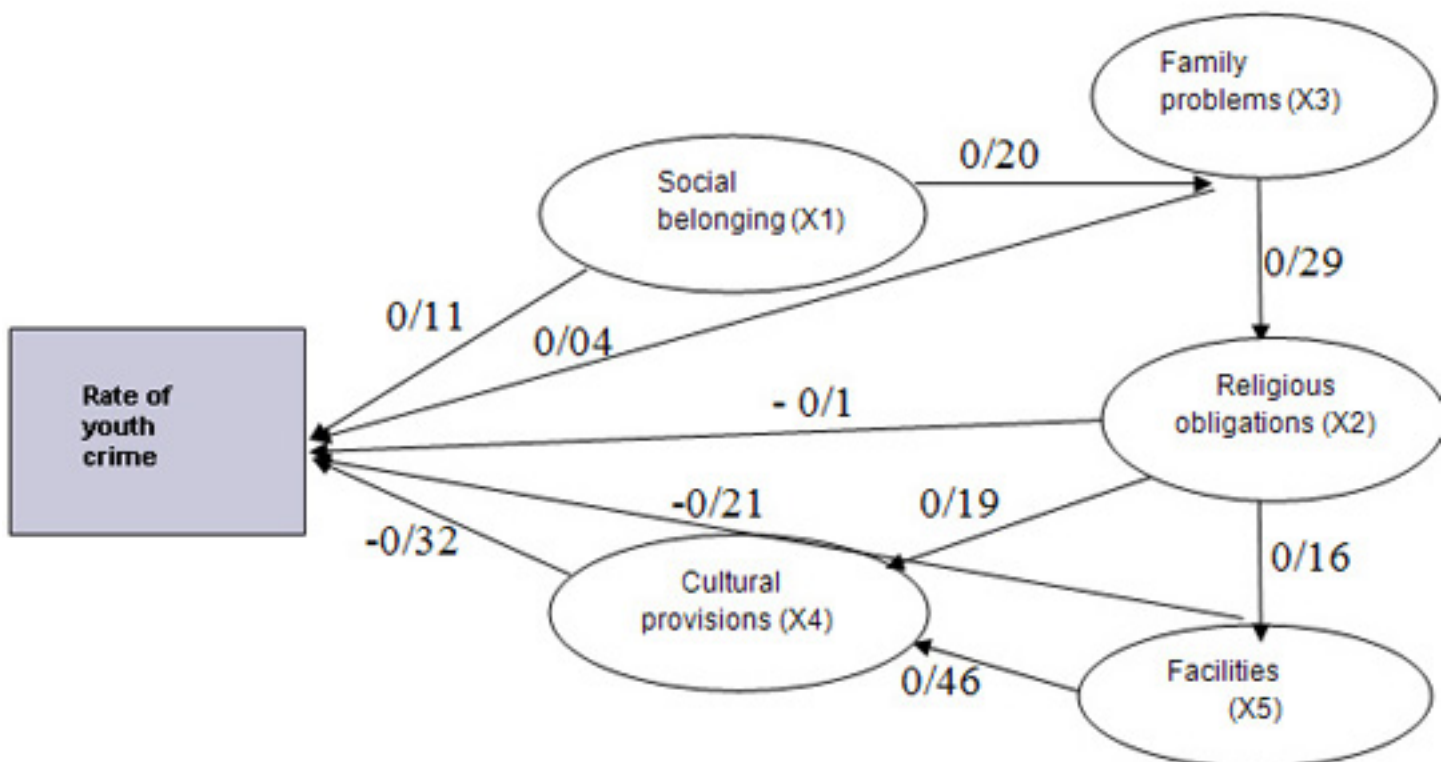


Figure 1: Research conceptual model



commitment, involvement, and belief. Any setback on the path of fulfilling these elements could pave the ways for the spread of delinquent behaviors. One who is less loyal to the ethical codes and values of a group, would be consequently more prone to engage in deviant behaviors. (Omidvar and Saremi, 2002:56) The indicator of religiosity and religious commitments is also influential in the rate of abnormality and crime: the more fragile one's religious commitment, the higher his/her chance to be found engaged in abnormal and delinquent behaviors. Being originally borrowed from the theory of Hirschi, this indicator argues that when someone's sense of belonging to society shrinks, s/he will be more driven to take part in the delinquent behaviors as such, while one's unwavering attachment to the ethical codes of society keeps him/her away from these kinds of abnormalities. The findings of this section were consistent with those of Rahmani (2008).

3. The value of Pearson correlation coefficient for the variables of family problems and the rate of youth abnormality and crime was  $-0/007$  with its significance level being measured at  $0/926$ . A significant relationship was not reported between the two variables. Again, the social control theory of Hirschi treasures social contact as an element which prevents the youth from engaging in abnormality and crime. Any family problem or lack of well-organized social contacts and commitment brings about all kinds of abnormality and crime. Let's suppose a family which does not pay sufficient attention to the needs of its younger members, or does not devote enough time and space to deal with their problems. In such a depriving circle, the younger members are left with no choice but embracing delinquency and abnormality as a desperate measure to bridge the widening gap. It is why family problems contribute to the expansion of social abnormalities. According to the theory of social disorganization, low socio-economic states, living in the suburban areas and slums, poverty, and unemployment, to name a few,

are elements central to the spread of family tensions and problems, which in turn, result in the individual's propensity for abnormal behavior. However, the findings of this section did not support the very idea that family problems cause abnormality. Therefore, the findings of this section did not correspond with those of Rahmani (2008).

4. Pearson correlation coefficient ( $-0/442$ ) which was significant at  $0/000$ , indicated a relationship between lack of cultural provisions and the rate of abnormality and crime among the youth. This relationship was mean and negative in that by increasing the cultural provisions, there would happen a decline in the rate of abnormality and vice-versa.

5. The measurement level for the variables of facilities and the rate of abnormality and crime was spatial. The value of Pearson correlation coefficient was  $-0/385$  and its level of significance was measured at  $0/000$ . The relationship was again mean and negative. By increasing the amount of facilities, there would be a noticeable decline in the rate of abnormality and vice-versa. The results shown in this section well corresponded with those of Mohajerin (2008) and Kargar (2008). In sum, lack of facilities contributed heavily to the expansion of all kinds of social abnormalities and crimes across the suburban areas.

6. There was a significant difference between the means of youth crime for boys and girls ( $t\text{-test}=3/01$ ). As opposed to the girls with  $30/7$  inclination toward abnormal behaviors, the boy participants dominated with a rate of  $34/1$ .

7. The socio-economic state of the participants influenced the rate of social abnormality, and held a reverse relationship with it. Having been based on the theories of social pressure and social disorganization, this indicator argued that neighborhood associations were related to lower socio-economic states, and any decline in fulfilling the material needs and goals or in obtaining social acceptance could

result in a strong propensity for abnormality.

8. Insufficient social control or lack of external control could spur on the high rates of abnormality. The theory of social disorganization suggests that living in suburban areas characterized with high rates of mobilization and social variety helps with decreasing the level of social control, which ultimately generates high rates of abnormality and crime.

### Concluding Discussion

Through the prism of the structural elements influencing abnormality, this empirical study set out to identify the elements which influenced the rate of social abnormality and crime among the suburban youth of an Iranian southern city. The obtained results demonstrated that the rate of abnormality and crime for this youth was  $82/6$  which encompassed a mean to very high rate, and this type of abnormality was shown as being influenced by variables as diverse as: lack of facilities, low socio-economic states, lack of cultural provisions, fragile religious commitment (or as Hirschi put it, "an indicator for lack of internal control"), and family problems. Moreover, the results also did show that association with abnormal individuals was an indicator for lack of external social control and lack of strong religious commitment (internal control), and ultimately lack of strong religious commitment was decided to be an immediate offspring of family problems and low socio-economic states.

In summary, as has been intimated in the earlier parts of the article, lack of facilities which was informed by insufficient external/internal control, marked itself as a paramount variable to influence the rate of abnormality and crime among the suburban youth. Lack of internal social control or lack of a strong commitment to the values of society came from family problems and low socio-economic states. The following recommendations derived from the above materials are of potential implications for promoting the status quo:

The socio-economic states of people should be considered as a matter of special priority in future public policies, as the study's theoretical framework indicated, in doing so, the social pressures will decrease; people will be empowered to accomplish their aims; they will be privileged with stronger senses of belonging to society; and their potential passion to engage in abnormal behavior and crime will diminish. Furthermore, increased external control will contribute to decreasing the pressures that come from abnormal behaviors. Our theoretical framework well leant itself to indicate that living in the suburban areas characterized with high mobilization, social variety, density, and abnormal residential patterns would undermine external social controls. Therefore, increased social control over such localities may bring substantial promotion in their residents' lifestyles and environment.

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# Factors influencing the level of fast food consumption among adolescents in Muscat, Oman

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## Abstract

**Objective:** To determine the factors influencing the level of fast food consumption in the adolescent population in Oman.

**Background:** The rising popularity of fast foods has led to a high intake among adolescents throughout the world. Economic and adolescent behavioral dietary patterns are just two important factors of the many that affect the rate of fast food consumption in Oman.

**Method:** A cross sectional survey was done and questionnaires were handed out to 4 schools and 1 college and there were 402 respondents. Questions were asked on the lifestyle, awareness and popularity of fast foods. A chi test was done to determine whether economic and behavioral factors

affected the rate of fast food consumption. The age groups were plotted against the rate of future fast food consumption.

**Result:** It was found that income levels and level of cost did not affect the rate of fast food consumption because the statistical analysis proved that the variables were independent of each other. The behavioral factors also did not influence the rate of fast food consumption since there were a greater percentage of adolescents who were not calorie conscious. It was determined that as the age increased, the level of future fast food consumption decreased.

**Conclusion:** More than one third of responders think fast food is expensive. Girls are more calorie conscious than boys. Neither

behavior nor economic factors affected the rate of fast food consumption among adolescents. It also concluded that the age was indirectly proportional to the rate of future fast food consumption.

**Key words:** Adolescent, Fast food, economic and behavioral effect



## Introduction

Fast food has become a prominent feature of the diet of children in the United States and, increasingly, throughout the world. The rising popularity of fast foods has led to a high intake among adolescents and young adults throughout the world. Numerous factors are responsible for the rising popularity of fast foods[1]. Globalization of world economy has resulted in junk food becoming a worldwide phenomenon. Fast food is a prominent feature in the diet of adolescents and young adults throughout the world and its popularity has increased due to various socioeconomic, behavioural, psychosocial and demographic factors [2].

The availability of junk food and snacks at low prices and marketing has triggered an evolution of consumption of foods that require neither the structure nor the preparation of a formal meal. Many studies have suggested that the increase in snack consumption is associated with an increase in obesity, tooth decay and other chronic diseases among children and adolescents [3]. There is a link between the pattern of snack consumption and an increase in the energy density of food consumed, a decrease in satiety, passive over-consumption, and an increase in obesity. In turn if fast food consumption patterns are ascertained then obesity related illnesses could be correlated to high consumption patterns in future studies. The awareness of fast foods in different countries is affected in various ways[4]. Economic and adolescent behavioral dietary patterns are just two important factors of the many that affect the rate of fast food consumption in Oman.

The study investigated the economic and behavioral factors influencing the awareness of fast food consumption among adolescents and young adults in Muscat, Oman. The hypothesis on finding whether economic levels influenced the level of fast food consumption were the cheaper fast foods are, the more they will be consumed by people. For further

assessment on the economic levels and fast food, people with a higher income would prefer eating outside and in turn would have higher consumption levels. To check for behavioral patterns to determine whether calorie conscious levels affected fast food consumption levels and which gender was more susceptible to fast food consumption.

## Materials

A cross sectional survey was done using a structured questionnaire. The questionnaire consisted of 3 Likert, 7 dichotomous, 1 open-ended and 21 closed-ended questions. It assessed the consumption levels, the demographic, social, behavioral, psychological factors and the awareness level of the adolescents. The dichotomous questions were mainly the yes/no type. The scaling for the Likert questions was done by assigning a higher number code to the strongly agree response.

## Methods

A preliminary survey (pilot survey) was done and 25 questionnaires were circulated randomly so that questions, which were not competent, could be analyzed and rephrased. Responses on the length and interest of topic were also accepted. Five schools were chosen in the area for easy means of accessibility. After approaching five schools in the area, four consents were given for the distribution of questionnaires and were divided so that 2 expatriate schools (Indian School Al-Ghubra, The Indian School Muscat) and 2 Omani Schools (The Sultan School, The Azzan bin-Qais School) could be analyzed. A total of 600 questionnaires were distributed. It was divided equally among all the 4 schools and 1 college. The distribution of questionnaires was done randomly; questionnaires were given to grades 7-10 in an expatriate school and 11- 12 were given to an Omani school and vice versa. The intended targets were adolescents between the ages of 11-25 and they were distributed to both males and females. The questionnaires were distributed on November 18th - 23rd. After they were returned, the total number of copies that were filled was

counted. The total number of copies came to 402. All responses were converted into numerical codes and a codebook was maintained. All the positive responses for the variables were given a higher number code. Cross tabulations, percentages, odds-ratio test, and chi-squared test were used to analyze the data.

## Results

The total number of students was 402, with 57% female and 43% male students. Age range 14-16 years were the most significant responders (Graph I). Data for the views on the cost of fast foods are summarized in Table 1. The table shows that a large percentage (82%) of adolescents think that fast food restaurants in Muscat are expensive. Those who think fast food is expensive have low consumption (30%).

Nearly half of them were eating from fast food restaurants (44%) rather than at home (35%).

The people with a higher level of income, 23%, eat at fast food restaurants while people with a lower income eat at home most of the time 15.9%.

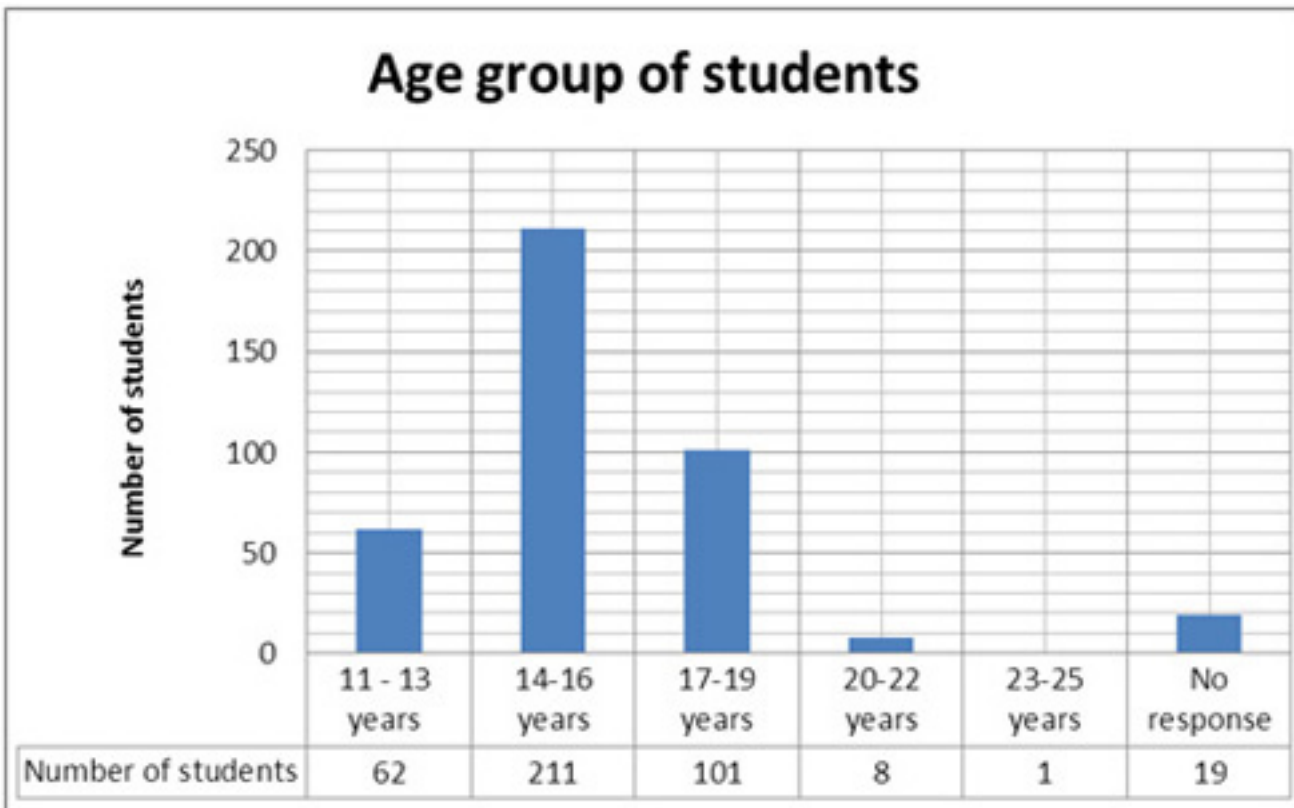
The data shows that 70% of adolescents are not calorie conscious. Of those, 30% who are caloric conscious are mainly girls. Consumption levels affected the girls who are calorie conscious. Out of the 57 females, 42 (74%) consumed less compared to 14 (25%) females.

## Discussion

This study has shown a significant awareness regarding fast food consumption. More than one third of adolescents think that fast food is expensive. In a study on the socio economic areas in China on eight middle schools in two distinct socio-economic areas of the Jiangsu province, 10% of the high (Socio-Economic Status) boys consumed fast food daily compared with 2.8% of the low socio economic boys[7]. Consequently, the students who had a higher income and better lifestyle could buy more fast foods and consumed more than the low-income students[8].

Behavioral attitude affected by gender			
	Calorie Conscious		
Gender	Yes (observed)	No (observed)	Total
Females	57	127	184
Males	50	121	171
<b>Total</b>	<b>107</b>	<b>248</b>	<b>355</b>

Table 1



Graph1

There are also behavioral patterns that affect the eating habits and preferences of adolescents. The frequency of fast food restaurant use was also positively associated with intake of total energy, percent energy from fat, cheeseburgers, French fries and pizza was positively associated with student employment, television viewing and home availability of unhealthy foods and was inversely proportional to the students' own and perceived maternal and peer concerns about healthy eating. Health-related behavior in early life influences later and may have bad consequences if not handled properly [9].

Risks for lifestyle-related disorders requires health education initiatives targeting students, which necessitates having a detailed knowledge about the health of students, their health related behaviors, and factors that influence these behaviors[10]. It seems that positive healthy practices could have a buffering effect on depressive symptoms. Adolescents with more positive practices are less likely to report depressive symptoms[11].

According to one of the researchers it was suggested that the availability of fast foods at cheap prices was what influenced the consumption of foods. In our case since the prices of fast foods are high, this is indirectly

proportional to the consumption of fast foods. The adolescents who thought that fast foods were cheaper showed a greater number as low consumers than high consumers[12]. People who had a higher income would prefer going out to eat at fast food restaurants, which would affect their consumption levels and group them as high. There were a higher percentage of people who had higher incomes and went to eat frequently at FFR's than people who preferred to eat at home. When these select groups of people were placed against consumption levels, a greater percentage (53%) consumed less fast food. This further proves that adolescents who go to FFR's are aware of the risks and do not

consume in excess even though they have enough money to buy food.

People with higher incomes do not necessarily need to be high consumers. They could be very well educated and know the risks of eating too much fast food. Lower income people on the other hand might be the high consumers because in certain countries fast food is cheaper. It will give them all calories needed for a day and it is cheaper for them to buy[13].

Adolescents who were more calorie conscious consumed less compared to those who were not calorie conscious. A study done showed the rate of fast food consumption was inversely proportional to the student's own concerns about healthy living[3]. A high number of students in our study were not calorie conscious. It was noted that girls who are calorie conscious consume less fast foods (74%) than those who are high consumers (24%). (Table 1)

Students should be advised and taught about taking balanced diets. They should know the health risks of having a large intake of calories and the harm it can cause them. Sports and exercise could also be a way to help students create an awareness as to how they can use up their calories. As people become older, the awareness of fast food consumption increases and therefore they will know that their future fast food consumption is supposed to decrease[14]. As seen on the graph, the median age group when compared to the area for the expected increase in consumption level, slowly increases from one age to the next until it finally drops to 0 % in the last age group. For the area related to 'remain unchanged', the area slowly reduces also as the age group gets higher and finally drops to 0 %. For the area that represented a decrease in consumption level, the general trend was that the area was first narrow but was still increasing and then when it reached the last 3 age groups the area started getting wider. From this conclusion, we can say that as the adolescents grow older they start becoming aware of

the risks that fast foods can cause and therefore their future projected levels of consumption decrease.

There is a possibility that future consumption levels will not decrease directly proportional to the age group[15]. There might be a few instances in which people who do not live with families, or bachelors who do not know how to cook, have an increased rate of fast food consumption level[16]. Obesity is a major risk in adolescents all over the world; this will further increase the risk of heart disease, diabetes and hypertension. There are studies which show the high risk and various factors influencing obesity; one of them is fast food intake[17].

**Limitation of this study:**

Self-reported questionnaires used might elicit inflated or false responses, especially in such a sensitive age group. However, self-reported questionnaires are easy to apply, and it was logistically difficult to conduct structured interviews for such a large sample. The last limitation is the difficulty to show how representative this student sample is in Oman in relation to the Omani adolescents. Although education is universal in Oman, the possibility of dropping out should always be accounted for.

**Conclusion**

Perception regarding expensive fast food is high among adolescents. Low consumption of fast food is seen in the group which thinks it is expensive. The high income group goes to fast food restaurants more frequently than the low income group. In the Arabian Gulf, the traditional diet, characterized as a high-fiber content and low in fat, has changed to a more westernized diet with a high content of fat, free sugars, sodium and cholesterol. Additionally, children spend more time viewing television and using computers and their greater exposure to TV and videos may influence children's consumption of unhealthy foods.

**Recommendation**

Utilization of the current study findings by taking the protective and risk factors of adolescents 'obesity in a future prevention program, as it is rapidly emerging as a global epidemic directly proportional to fast food consumption that will have profound public health consequences as overweight children become overweight adults particularly if obesity is present in adolescence. We need to take that into consideration whenever a dietary education program is established. The recent changes in the nutrition environment, including greater reliance on convenience foods and fast foods, a lack of access to fruit and vegetables, and expanding portion sizes, are also widely believed to contribute to the epidemic of childhood obesity.

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# Autism today in Libya: Is it a tip of an iceberg? (A comparative study)

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Libya has witnessed an increase in the number of individuals being diagnosed with an autism spectrum disorder. For example, over the past two years, despite the war and the Libyan revolution, the number of new diagnoses per year has increased nearly 2 fold (Zeglam et al 2009) with more than 166 children newly diagnosed with an autism spectrum disorder in 2011. This increase in identified children with autism spectrum disorders has been observed in other parts of the world.

In Libya, this trend in diagnoses has raised concern amongst clinicians, service providers, administrators, and the general public. However, in the absence of any large scale study, the actual prevalence or incidence rates for autism spectrum disorders in Libya are unknown and little has been invested in development of approaches or systems to clarify local information. As a result non Libyan studies are commonly reviewed for estimates of population prevalence.

## Abstract

**Hospital based study of all children referred to Neurodevelopment Clinic of Al-Khadra Hospital, Tripoli, Libya (NDC-KH) between year 2009 and 2011 with the diagnosis of either Speech or Language delay (SALD), or behavioral difficulties.**

### Aims:

1. To estimate and compare the prevalence of autistic spectrum disorders in children attending the Neurodevelopment Clinic of Al-Khadra Hospital (NDC-KH) with SALD or behavioral difficulties, between January 2009 and December 2011.
2. To help policy planners and service providers get on with the task of improving the funding, type and quality of services required for these children and their families living in our community.

**Methods:** A comparison review of ASD diagnoses was made among children attending the NDC-KH with SALD between the years 2009 and 2011.

**Results:** In 2009 the total number of children seen in Paediatrics Out-patient Department (POPD) was 12,905 out of whom 98

children were referred for ASD assessment and whose ages "ranged from younger than 3 years to 10 years of age". ASD were diagnosed in 85% (84 children) which gives a prevalence of 7:1000. In the 2010 study 17,267 children were seen in POPD and 263 children whose ages "ranged from younger than 3 years to over 14 years" were referred for ASD assessment. ASD were diagnosed in 74% (195 children) which gives the prevalence of approximately 11:1000. In the 2011 study 15,085 children were seen in POPD and 200 children whose ages "ranged from younger than 3 years to over 12 years" were referred for ASD assessment. ASD were diagnosed in 83% (166 children) which gives a prevalence of 10:1000.

**Conclusion:** The prevalence of the problem is probably higher and probably similar to that seen in the USA and UK. No data were available from the Arab countries or other developing countries. Autism is an important differential diagnosis of any language disorder "and behavioral difficulties". We highlight the need for accurate incidence and prevalence estimates in order to adequately plan for the current and future needs of people with an ASD thereby enabling them to maximize their potential to participate in their communities.

Autism is a spectrum disorder with cases ranging from a relatively mild problem with social interaction to more severe difficulties in behaviour, such as not speaking, following rigid routines and social isolation. It is estimated that around 1 in 100 children between 5 and 9 years of age have autism (1-3). Studies in developed countries have reported up to 60 cases per 10,000 of all forms of autistic spectrum disorders (ASDs) (4). Comparable figures, however, are not available for Libya(5, 6). A hospital based study in Tripoli reported a prevalence of autism of 1:300 approximately. (7, 8) The important historical observation about autism is that it was unknown in ancient culture and even up to the 19th century. It just “appeared” some 60 years ago (9). Leo Kanner, was first to describe autism in 1943 (10) and, in 1944, Hans Asperger also described children with similar symptoms (11).

The aims of the project were to provide decision-makers prevalence rates with which to describe the burden of the disorder throughout

the country; to provide baseline statistics from which to measure patterns in prevalence over time, and to ultimately help policy planners to adequately manage the provision of services required for these children living in our community. In order to help policy planners and service providers get on with the task of improving the funding, type and quality of services required for these children and their families living in our community, we conducted a comparison review of ASD diagnoses made between the years 2009 and 2011 (Table 1).

**Methods**

A comparison review of ASD diagnoses was made between the years 2009 and 2011 .This was a hospital-based study. Children were identified as having an ASD through screening of all children referred to the Neurodevelopment Clinic of Al-Khadra Teaching Hospital (NDC-KH), Tripoli, Libya between January 2009 and December 2011 with the diagnosis of delayed speech and language, no speech or

language or behavioral difficulties. Children were reviewed, scored and classified by a clinician (AZ) as having ASD if they displayed behavioral abnormalities consistent with DSM-IV for diagnosing (12) i) autism, ii) pervasive developmental disorder not otherwise specified (PDD-NOS), including atypical autism, or iii) Asperger disorder (13). A range of assessment tools were used including the M-CHAT, and observations in various settings and discussions with significant others. Diagnoses were made on the basis of the assessment results and according to DSM-IV criteria.

The Neurodevelopment Clinic is a regular weekly clinic at POPD-KH where 40 to 50 children (0-16 years) are seen per session. It is a consultant-led clinic (AZ) in addition to having 1 registrar, 1 senior house officer and a nurse. The clinic serves Tripoli, its suburbs and other hospitals, and receives referrals from other regions in Libya. The clinic also cares for children with other neurological problems in the region.

Results	2011	2010	2009
Total number of children seen in POPD	15085	17267	12905
Speech and Language Disorders	200	263	98
Autistic Spectrum Disorders	166 1:91 10:1000	195 1:89 11:1000	84 1:153 7:1000
Autism	139 1:109 9:1000	143 1:121 8:1000	63 1:205 5:1000

Table 1: Prevalence of ASD 2009-2011



**Results**

In 2009 the total number of children seen in Paediatrics Out-patient Department (POPD) was 12,905 out of whom 98 children were referred for ASD assessment and whose ages “ranged from younger than 3 years to 10 years of age”. ASD were diagnosed in 85% (84 children) which gives the prevalence of 7:1000. In the 2010 study 17,267 children were seen in POPD and 263 children whose ages “ranged from younger than 3 years to over 14 years” were referred for ASD assessment. ASD were diagnosed in 74% (195 children) which gives the prevalence of approximately 11:1000. In the 2011 study 15,085 children were seen in POPD and 200 children whose ages “ranged from younger than 3 years to over 12 years” were referred for ASD assessment. ASD were diagnosed in 83% (166 children) which gives the prevalence of 10:1000 (Figure 1). We report that, in spite of population stability in the

area, there was a significant increase in both referrals and positive ASD diagnoses between these years. The prevalence was based on period prevalence estimates of ASD for children of all age groups attending the Neurodevelopment Clinic. While diagnostic rates in Libya had risen significantly over the past years, in line with international trends, these findings suggested that rates had been ‘reasonably consistent in recent years’. We highlight the need for accurate incidence and prevalence estimates in order to adequately plan for the current and future needs of people with an ASD thereby enabling them to maximize their potential to participate in their communities. Overall about 5 percent of these children were considered to be either high functioning or to have Asperger’s Syndrome, while 70 percent of the children were considered to have a formal diagnosis of autism. In line with other studies, the reported

overall male to female ratio was approximately 4:1.

**Discussion**

There is considerable evidence that the diagnosis of ASDs has increased globally over the last two decades. To the best of our knowledge, this is the first study in Libya on autism and we believe our sample is representative of the Libyan population.

Because ASDs are diagnosed on the basis of behavioral criteria and clinicians might apply criteria differently to arrive at a diagnosis of autism and related subtypes, determining prevalence is challenging (14-15). The reasons for the increase are still largely unexplained, but it is most likely multi-factorial, and in particular includes differences in case ascertainment, changes in diagnostic methods and improved pathways to diagnosis. This study was the first attempt to present statistics for ASD

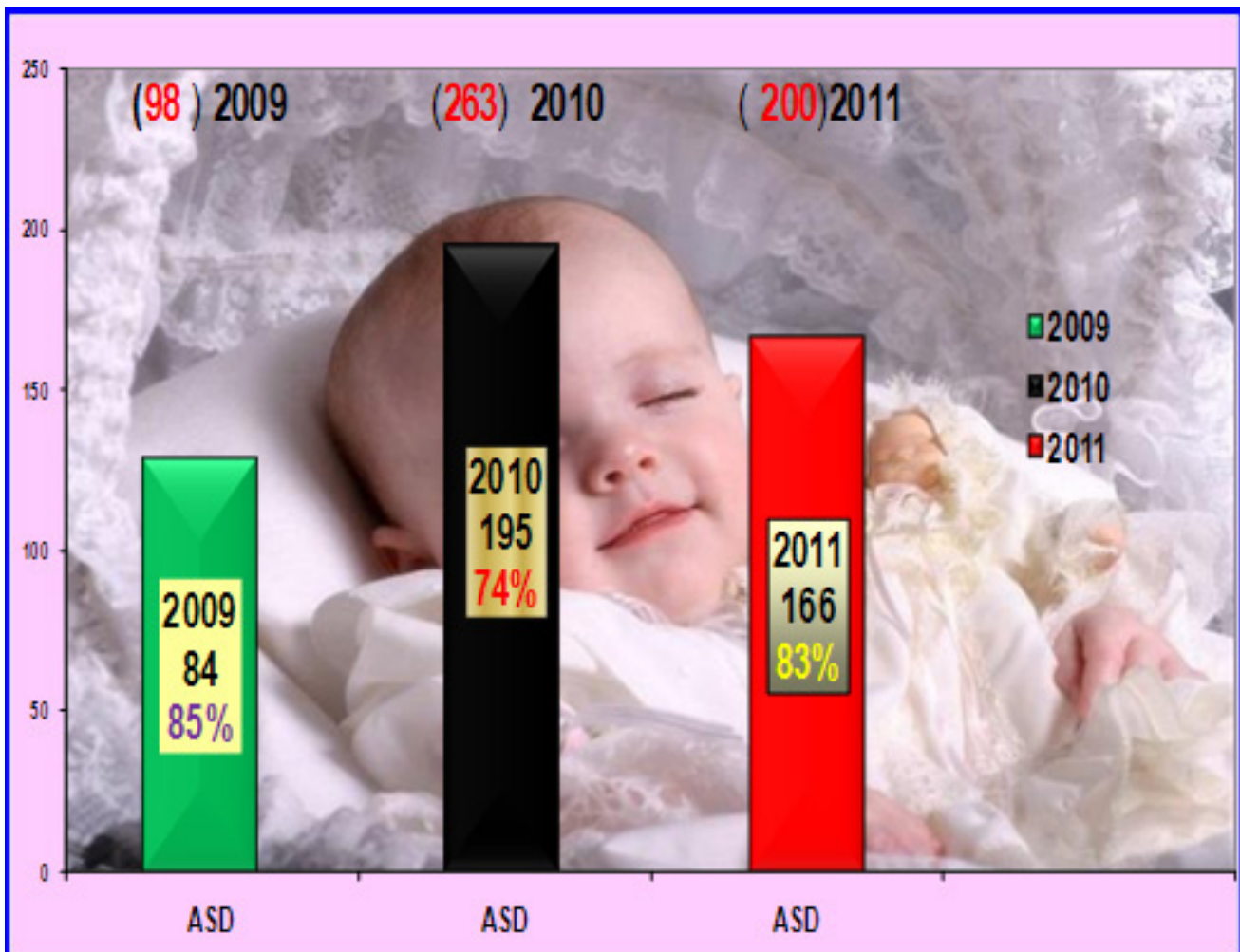


Figure 1: Percentage of children diagnosed with autism to total number of children with speech and language disorders

diagnoses among Libyan children using data from children attending NDC-KH. The aims of the project were to provide Libyan prevalence rates with which to describe the impact of the disorder throughout the country, to provide baseline statistics from which to measure patterns in prevalence over time, and to ultimately help policy planners to adequately manage the provision of services required for these children living in our community. The prevalence of autism in 2009-2011, according to hospital data, ranged from 5:1000 in 2009 to 9:1000 in 2011. The prevalence of ASD ranged from 7:1000 in 2009 to 10:1000 in 2011. These figures are significantly lower than other larger studies in developed countries and probably do not reflect the true prevalence of the disease in the community. In our children, (15%), (26%), and (17%) had isolated speech and language disorder in 2009, 2010 and 2011 respectively. Males outnumbered females by a ratio of 4 to 1 for ASD and 4.5 to 1 for autism; this is generally consistent with the sex distribution of autism given in developed countries (16, 17, 18). Based on the prevalence of autism in the United States (0.2%), it has been estimated that there may be around 11,000 people with autism in Libya (19). These extrapolated data may be highly imprecise, but they indicate the need for further investigation to obtain more accurate figures in order to identify the true extent of the problem and be able to devise strategies and intervention programmes to address it.

### Conclusion

At the current time, the prevalence of ASDs in Libya is not certain from existing data. However there has been a true and significant increase in autism prevalence. To date, the health and education authorities have not paid enough attention to this serious epidemic and its present and future impact. Many of those being diagnosed are still not in any form of education or any form of early intervention programme. The biggest problem in any developing country, including Libya, is the lack of awareness of the parents and

hence the lack of early interventions that may be available. Autism is an important differential diagnosis of any "language disorder" delayed or no speech and language, and behavioral difficulties. It is often diagnosed late because of its peculiar presentation in children, has a wide spectrum of different behavioral patterns and the wrong belief from the side of the parents that the child will talk eventually. A low index of suspicion and because the parents are ashamed and afraid of hearing the diagnosis, are other causes of delayed diagnosis. Referral to professionals with experience in these sorts of problems saves time, money and prevents unnecessary investigations and treatment. Although our findings are preliminary, hospital based and the first to be conducted in Libya, they indicate the need for decision-makers to plan services and research the problem of ASDs countrywide.

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# Incidence of visible and occult blood on laryngoscopes of emergency and routine cases

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## Introduction

The devastating spread of human immunodeficiency virus (HIV) and hepatitis B virus (HBV) over the past decade has resulted in the development of specific guidelines for the cleaning, disinfection, sterilization, and handling of medical equipment and instruments. (1) Several studies suggest procedures for cleaning, disinfection, sterilization, or handling of laryngoscope blades and handles are ineffective. (2)

At the end of every general anaesthesia case, an anaesthetic technician is supposed to dismantle the blade from the handle and proceed with the following protocol:

1. The blades are soaked in Haemosol®, mechanically washed and then followed with a sterilization cycle in the Steris™ TM sterilizer. The sterile blades are then kept in a clean area until needed.
2. The handles are washed with a hospital approved agent after every use, then returned to the top of the anaesthesia cart, although in reality they are only cleaned if grossly contaminated.(3) There are very few documented cases of anaesthesia related transmission of nosocomial infection. However, actual documented cross-infection by anaesthesia equipment may be rare due to the difficulty in establishing a causal relationship between anaesthetic practice, equipment contamination, and postoperative infection.(4) This may be the result of long incubation periods and subclinical infections associated with certain blood borne pathogens, such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).(5)

Once contracted, these viruses are extremely difficult and costly to treat and are oftentimes fatal. (6) Therefore, the effectiveness of anaesthesia equipment cleaning,

## Abstract

**Background:** Contamination of laryngoscope blades and handles with visible blood frequently occurs during routine laryngoscopy and endotracheal intubation where it could provide good media for the transmission of the HBs and HIV.

**Objective:** The purpose of this study is to determine the incidence of visible and occult blood on laryngoscopes of emergency and routine cases.

**Method:** Sixty-five laryngoscope blades and handles identified as ready for patient use were observed for visible blood, and tested for occult blood in emergency and routine cases, within one week . A modified version of the three-stage phenolphthalein blood indicator test was employed to determine the presence of occult blood.

**Results:** None of the blades or handles observed had visible blood. 65 blades tested for occult blood, 13 (20%) tested positive, and 26 (40%) of handles tested for occult blood showed a positive result. More emergency blades and handles tested positive for occult

blood than cold cases blades and handles ( $P < 0.01$ ).

**Conclusion:** The study confirms the presence of an occult blood in the handle and blades of the laryngoscopes which could be an indicator of potential cross infection in emergency and routine cases.

**Key words:** Laryngoscope, handle, blade, occult blood

disinfection, sterilization, and handling needs to be verified thoroughly.

A significant factor in preventing nosocomial infection is the development of disinfection and sterilization procedures for medical instruments and equipment. Spaulding devised a classification scheme that has been used as the framework for identifying appropriate levels of disinfection or sterilization for all medical instruments, equipment, and surfaces in patient treatment areas. The categories were based on the degree of risk of infection associated with their clinical use.<sup>(7)</sup> This classification scheme is so logical that the Centers for Disease Control and Prevention (CDC) also uses it in its guidelines.<sup>(8)</sup> The categories are as follows:

1. Skin or enter sterile areas of the body, such as spinal needles, surgical instruments, or implants. These items must be sterile prior to patient use.
2. Semi-critical items are devices that come in contact with mucous membranes, such as laryngoscopes, breathing circuits, tracheal tubes, fiberoptic endoscopes, and bronchoscopes. These items require a high level of disinfection or sterilization.
3. Non-critical items are devices that may have contact with the patient's intact skin and seldom, if ever, become contaminated with patient material such as blood. Examples of such items are blood pressure cuffs, pulse oximeter probes, electrocardiogram electrodes, and stethoscopes. These items can be washed or scrubbed with a detergent and warm water for an adequate level of safety; however, in some instances, an intermediate- to low level chemical germicide may be used for added assurance of safety.<sup>(9)</sup>

In our routine practice in the operation theater of Al-Gamhorea Teaching Hospitals, Yemen, Aden, cleaning and sterilization of

the anesthetic equipment is not done according to the standard international protocol. Since the presence of blood is an excellent indicator of potential cross-infection the purpose of this study is to determine the incidence of visible and occult blood on laryngoscope blades and handles, identified as ready for patient use.

### Material and Methods

This descriptive study was collected at a Al Gamhorea Teaching Hospital with five to six operating rooms in daily use in emergency and cold cases. A written letter was sent to the Director of the Hospital and Head of the Operation Theater who gave us permission to investigate and report. The laryngoscopes studied were identified as "patient ready" prior to inspection. Daily sampling occurred prior to the beginning of the day's cases. At the end of the day 65 laryngoscope blades and handles were inspected. Samples collected within one week were then sent to the laboratory of the hospital which is close to the operation theater. The tests were carried out first by carefully inspecting the presence of visible blood on the surface of each laryngoscope blades and handles. Next, the blade and handle were wiped with separate 70% isopropyl alcohol pads. Each alcohol wipe was placed in a plastic zipper storage bag appropriately labeled with either blade or handle, cold or emergency cases. To test for occult blood, the modified three-stage phenolphthalein blood indicator test was performed at the end of the day. The samples were placed on a white background to better distinguish between the positive and negative results, and a second reading was obtained for all results.

All results were recorded as yes or no on a data collection tool. The collected data were analyzed and percentages were computed based on the relative rate of occurrence. Finally, the standard error of a proportion of rates of occurrence were calculated to determine the significance ( $P < 0.01$ ).

### Results

None of the 65 blades or handles observed in this study had visible blood. The alcohol pad was visibly discolored after wiping one (2%) blade and four (6%) handles. Of the 65 blades tested for occult blood, 13 (20%) tested positive at 60 seconds.

Of the 65 handles tested for occult blood, 26 (40%) tested positive at 60 seconds (Tables 1 and 2). Of the total 65 blades and handles tested, there were 35 blades and handles tested in the cold cases and 30 blades and handles tested in the emergency cases. There were more emergency blades ( $n = 9$ ) and handles ( $n = 14$ ) that tested positive for occult blood than cold cases blades ( $n = 4$ ) and handles ( $n = 12$ ) (Table 1). Standard error of a proportion of rates of occurrence were calculated to test the significance of the differences of the total rates of occurrences of 20% and 40% and to test the significance of the differences of the cold cases and emergency cases occurrences.

All comparisons were significant at  $P < 0.01$ .

Figure 2 shows, 14 handle and 9 blades of the laryngoscope in emergency cases had blood more than cold cases handles and blades (12,4 respectively).

### Discussion

Occult blood was present on 20% ( $n = 13$ ) of laryngoscope blades and 40% ( $n = 26$ ) of laryngoscope handles that were identified as ready for patient use. These findings are compatible with a similar study carried out in 1994. Using a guiac-based test for occult blood with a reported sensitivity of 1:10,000, these researchers found occult blood on 10.5% of laryngoscope blades and 50% of laryngoscope handles tested (10). Their conclusions were that the use of more rigorous decontamination protocols, disposable equipment, or disposable blade and handle covers are necessary if anaesthesia technicians are to use clean equipment free of infectious material. The guiac-based and modified three-stage

	Total		Occult blood	
	Blades	Handles	Blades	Handles
Routine case	35	35	4	12
Emergency Cases	30	30	9	14
<b>Total</b>	<b>65</b>	<b>65</b>	<b>13</b>	<b>26</b>

**Table 1: Incidence of occult blood on laryngoscope blades and handles (n = 65)**

	Blades	Handles
Routine cases	11%	34%
Emergency	30%	47%
<b>Total</b>	<b>20%</b>	<b>40%</b>

**Table 2 : Occurrence of occult blood on laryngoscope blades and handles (n = 65)**

phenolphthalein blood indicator tests both had a reported sensitivity of 1:10,000, making either test appropriate to test for occult blood. However, the modified three-stage phenolphthalein blood indicator test seems easier to use on rough surfaces and perhaps had a more clear positive result.

In the current study, none of the 65 blades or handles tested revealed visible blood. In addition, only one blade (2%) and four (6%) handles had discoloration on the alcohol pad after wiping and before testing the 65 blades and handles for occult blood. This finding demonstrates that equipment was cleaned by the anaesthesia technician, but may still be contaminated with blood or other potentially infectious materials, such as bacteria. Visual inspection is not a reliable means of detecting blood contamination. The modified three-stage phenolphthalein blood indicator test could be used periodically to monitor the incidence of occult blood on laryngoscope blades and handles, as well as other anaesthesia equipment.

This study did not determine whether the presence of blood poses an actual risk of infection to the patient. However, the presence of blood is an indicator of potential cross-infection since it is known to transmit blood borne infectious disease. HBV and HIV antigen testing shows HBV to be much more viable than HIV(11). The viability of the hepatitis virus has been demonstrated for up to 2 weeks on metal surfaces, and it was noticed the antigenic stability can exist for up to 7 years.(12) Using HIV infectious doses was 100,000 times greater than that typically found in the blood or serum of patients with HIV infection. Studies have shown HIV was detectable by tissue-culture techniques 1 to 3 days after drying(13). The CDC has also shown the rapid reduction in HIV concentration (several hours) with drying.(14) Based on these findings, HBV and HIV might spread from patient to patient or patient to technician unless proper cleaning and disinfection of laryngoscope blades and handles is performed immediately after it has been used by a patient. The degree to which contaminated anaesthesia equipment

is a factor in the overall nosocomial infection rate is difficult to determine. The intact oral mucosa may offer somewhat of a barrier against infection. However, it has been demonstrated that the oral mucosa is oftentimes traumatized during routine laryngoscopy and oral intubation, and mucosal breaches may not be obvious to the eye. Contamination of laryngoscopes with visible and occult blood frequently occurs during routine airway management. (15) Anaesthesia technicians and anaesthesiologists routinely care for patients with functionally impaired immune systems, such as patients with diabetes mellitus, alcoholism, uremia, burns, pregnancy, prematurity, rheumatic diseases, and cancer.

Less frequently, they care for transplant recipients and patients with acquired immune deficiency syndrome (AIDS). Care for these patients must be more meticulous.(16) The anaesthetic state itself decreases the body's response to surgical trauma by blunting pain reflexes, providing cardiovascular stability, and decreasing the release



of stress hormones. The patient with an impaired immune system and altered mucous membranes is more vulnerable to postoperative nosocomial infection(17).

Laryngoscope blades, therefore must receive a thorough cleaning and high level disinfection or sterilization after each patient's use. The laryngoscope handle should possibly be recategorized into Spaulding's semi-critical category and, therefore, it should also receive a high level of disinfection or sterilization after each patient use to prevent transmission of infectious disease from patient to patient or patient to technician.

This study found a significant result by increased incidence of occult blood on the blades and handles during emergency when compared to the routine cases. This finding suggests that there is an increased incidence of contamination of blades and handles in the emergency room when compared with the routine cases.

This may be due to improper handling of anaesthesia equipment throughout the day. For instance, dirty laryngoscope handles are frequently returned to the top of the cart with all the clean syringes, tubes, airways, and other equipment. An unused laryngoscope blade is then placed on the used handle. The laryngoscope blade routinely comes in contact with the laryngoscope handle in the folded and waiting to be used position. Therefore, the used laryngoscope handle can serve as a fomite for infectious agents. In addition, the anaesthesia technicians oftentimes perform many tasks with the same pair of disposable gloves. For example, the same pair of disposable gloves used to intubate the patient are often also worn to turn on the anesthetic agents, adjust monitoring equipment, give additional intravenous medications, tape the patients eyes closed, and perform many other tasks that must be done expediently at the start of a general anesthetic.

The contaminated gloves could also serve as fomites for infectious agents and contaminate other anaesthesia equipment. Hall's study in 1994

found widespread contamination of anaesthesia surfaces in operating rooms with occult blood.(18) Some suggest that the following "clean" technique be employed during an induction:

1. The anaesthesiologist and the technician must each put on two pair of gloves.

2. Induction should be carried out in the usual fashion.

3. As soon as the endotracheal tube is in place, the blade should be held in the gloved hand and the outer gloves peeled off the hand and inverted over the dirty laryngoscope blade. The other outer glove is also removed leaving a clean pair of gloves to perform the other necessary tasks. This is just one way in which anaesthesia technicians can improve infection control procedures in the operating rooms.(19) Another possible reason occult blood may be present on laryngoscope blades and handles identified as ready for patient use is equipment failure. In this study, the technician soaked blades in Haemosol, scrubbed the blades manually, and then cycled the blades in the Steris sterilizer. Since the Haemosol contains an enzyme, but does not contain a detergent, perhaps the blood or debris was not being completely removed prior to sterilization. Kneedler and Darling looked at the effectiveness of soaking instruments in an enzymatic detergent solution during the initial cleaning process as a means of loosening and removing the bio-burden before sterilization. Their conclusions were that detergent-enzymes can eliminate the need for manual cleaning, thus reducing the exposure of personnel to pathogens during the cleaning process.

In addition, soaking in enzymatic detergent solutions can reduce the number of bacteria in many cases, but these products are not substitutes for sterilization.(20) Poor compliance with established cleaning and disinfecting protocols is another reason occult blood might be present on laryngoscope blades and handles. Tait and Tuttle's survey of 4% of practicing

anaesthesiologists in the United States suggests either poor compliance or unfamiliarity with established cleaning and disinfection protocols. Only 69% of those surveyed disinfected their laryngoscope blades in an acceptable manner. (21) Anesthesia technicians should be instructed in basic infection control procedures during their anesthesia education. Continuous in-service education is needed, however, to improve, supplement, and update knowledge in this field after their formal education. Anesthesia technicians should be made aware of studies related to infection control to increase their awareness of the disinfection and sterilization policies and procedures. An effort must be made by manufacturers of reusable anesthesia equipment to design more durable equipment that can be more easily and effectively cleaned and sterilized. Manufacturers have designed disposable equipment such as single use laryngoscope blades and handles or disposable plastic or latex blade and handle covers. Anesthesia providers find this equipment cumbersome and costly while being an insufficient substitution for currently used laryngoscope blades and handles.

The study should be done involving several medical facilities, using a larger sample size, for a longer time period to generalize the results of this study.

The conclusion of this study suggests the procedures for cleaning, disinfection, sterilization, and handling of laryngoscope blades and handles is effective as evidenced by occult blood detected on laryngoscope blades and handles identified as ready for patient use. The presence of blood is an indicator of potential cross-infection, since biological fluids, such as blood and saliva, are known to transmit infectious diseases.

**Recommendation:** Anesthesia technicians must take appropriate precautions to reduce the potential for transmission of infectious agents to the patients under their care.

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