Chronic Diseases
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# Chronic Diseases Journal

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# Chronic Diseases Journal

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# Chronic Diseases Journal

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*3. Kuczmarski RJ, Ogden CL, Grammer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. Advance data from vital and health statistics. No. 314. Hyattsville, Md: National Center for Health Statistics, 2000. (DHHS publication no. (PHS) 2000-1250 0-0431)*

*4. World Health organization. Strategic directions for strengthening nursing and midwifery services [online]. Available from: URL:http://www.wpro.who.int/themesfocuses/theme3/focus2/nursingmidwifery.pdf2002*

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## *Original Article(S)*



## *Case Report(S)*

Chronic Diseases Journal

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# A lump in throat: Qualitative study on hospitalization-related experiences among the parents of children with cancer

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Original Article

## Abstract

**BACKGROUND:** As the second leading cause of death, cancer is among the most stressful life events. It affects not only the afflicted patients, but also their families. Hospitalization of children with cancer faces their parents with many challenges and problems. This study was made to explore the hospitalization-related experiences among the parents of children with cancer.

**METHODS:** This qualitative phenomenological study was made in 2015–2016 in the hematology and oncology care unit of a teaching hospital located in Qazvin, Iran. Sampling was done purposefully and was ended once data saturation was achieved. Consequently, fifteen parents of children with cancer were recruited. Semi-structured interviews were held for data collection. The data were analyzed through the seven-step hermeneutic data analysis process proposed by Diekelmann and Ironside (1998).

**RESULTS:** Two main categories were extracted from the data which included "the shadow of government administration" and "the role of support systems". The former refers mainly to accommodations in hospital settings and the process of clinical care delivery, while the latter points to the parents' psychological experiences of presence in hospital settings. These themes came under the overarching main theme of "lump in throat: the suffering of the parents of children with cancer".

**CONCLUSION:** Study findings reveal that parents' experiences of hospitalization greatly depend on their perceptions of the environmental conditions of hospital settings. Moreover, the findings showed that negative hospitalization-related experiences could lead to many adverse consequences for patients, families, and healthcare providers.

**KEYWORDS:** Cancer, Children, Parents

***Date of submission:*** 17 Mar. 2018, ***Date of acceptance:*** 12 Sep. 2018

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## Introduction

Cancer is among the leading causes of death in the world so that after cardiovascular disease (CVD), it is called as the major epidemic of the present era.[1] Cancer is the third cause of death in our country, Iran, the second cause of childhood mortality in the Third World countries,[2,3] and among the most stressful life events.

Cancer-induced changes can affect not only the afflicted patients, but also their siblings, parents, and families.[4] Seriously-ill children who suffer from cancer need prolong hospitalizations and hence, they are frequently separated from their natural environment and are transferred to an unfamiliar environment.[5] Besides, different and complex treatment

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procedures exhaust children,[6] cause them great stress, and reduce the life quality of their parents who are usually their chief caregivers.[7]

Abundant evidence exists for the pivotal role of patients' significant others in the processes of treatments, illnesses, and patients' death. Nonetheless, healthcare providers solely focus on patients' needs.[8] Families of children who suffer from specific diseases such as cancer usually face problems such as restlessness, social isolation, frequent hospitalizations, and feelings of guilt, anger, and depression.[9] Litzelman et al. reported parental stress caused by their children's illnesses as a significant factor behind the reduction of the quality of life among the parents of children with cancer.[10]

Although children's hospitalization-related needs are important, fulfilling their parents' needs is also of great importance. Parents whose needs are effectively and adequately fulfilled are more capable of coping with their children's illnesses.[11,12] In order to provide quality care to their sick children, parents need to be supported actively, their concerns should be understood and alleviated, and they have to be involved in the process of care giving to their children.[12] The most basic needs of these parents are information, support, and hope.[13] According to Sayin and Aksoy, family members are usually worried about care delivery to their patients and thus, they need care-related information before making any attempt to fulfill their own other needs.[14] Fry and Warren[15] and Wong et al.[16] also noted that the most important need of critical care family members was the need for information about the course and prognosis of their patients' illnesses. The delivery of such information is among the responsibilities of healthcare providers and authorities.[17]

Many studies have been made so far into the parents' experiences of their children's illnesses. For instance, Majdalani et al. explored parents' experiences of their children's hospitalization in pediatric intensive care units (PICUs).[18] Plakas et al. also focused on the experiences of the parents of critically-ill patients in Greece.[19] Besides, Jadidi et al. did a study to explore the experiences of the parents of children with leukemia and reported that those exploring parents' experiences helped raise their hope and improve the effectiveness of care services.[20] In addition, information about the experiences and the satisfaction of patients can play a critical role in enhancing the quality of care and improving patients' health and recovery.[21] This study was made to explore hospitalization-related experiences among the parents of children with cancer.

## Materials and Methods

This qualitative phenomenological study was made in 2015–2016 in the hematology and oncology care unit of Qods Teaching Hospital, Qazvin, Iran. Sampling was done purposefully through which, fifteen parents of children with cancer were recruited.

Semi-structured face-to-face personal interviews were held in order to collect study data. An interview guide was used to manage the flow of the interviews. Interview guide included the experience of the first presence in the hospital, the behavior of medical and non-medical staff, parental involvement in the process of treatment and clinical education, mental relaxation in the hospital, criticism of the personnel, and etc. The inclusion criteria for participants were at least two cycles of treatment in the hospital for the care of the sick children and the interest in participating in the study. Interviews were held by the first author and were continued until data saturation was achieved. The length of the interviews was 35 minutes, on average. All interviews were conducted in a room in the hospital and were recorded using a digital recorder.

The data were analyzed through undergoing the seven-step hermeneutic data analysis

process proposed by Fitzpatrick and Kazer.[22] Initially, the contents of all recorded interviews were transcribed. In the second step, the interview transcripts were perused to obtain an understanding about them. Thereafter, the main ideas of each interview transcript were identified and coded. The extracted codes which were similar and pertained to same concepts were sorted into categories. The categories were in turn grouped into themes based on the similarities and the differences among them. In the fifth step, we attempted to validate the findings through referring to the main data. After that, the main themes were described and finally, the findings were provided to the participants and they were asked to approve the congruence between the data and their own experiences.

The participants were provided with information about the aims and the methods of the study and they were ensured about the confidentiality and the anonymity of their data. They read and signed the consent form of the study. At the beginning of each interview, the intended interviewee was informed that participation in and withdrawal from the study were voluntary. Besides, the interviews were anonymized and coded with numerical codes. We also ensured the participants that their information would be used solely by the researchers and for research purposes.

## Results

Most of the participants were mothers whose age ranged from 21 to 49 years and held primary to master's degrees. They referred to the study setting from different cities located in Qazvin Province. Most of them were housewives and only one of them was a white-collar worker. Their experiences of attending hospital settings fell into two main categories of "the shadow of government administration" and "the role of support systems", each of which had four subthemes (Table 1). All of these themes and subthemes came under the overarching main theme of "lump in throat: the suffering of the parents of children with cancer".

### *1. The shadow of government administration*

Because of the gap between the public and the private healthcare delivery systems in Iran, clients have a negative attitude towards public hospitals (such as the study setting) and evaluate care services provided by such centers to be of lower quality compared with private health centers. In other words, clients consider private and public healthcare delivery centers in Iran to be patient-centered and physician-centered, respectively. Such an attitude makes clients to prefer private centers over public ones.

*1.1. Negative attitude towards public hospitals:* The participants noted that in public hospitals, staffs were less committed to quality care delivery. Nonetheless, they were compelled to refer to public hospitals due to financial burdens associated with their children's illnesses and inadequate private chemotherapy and cancer care services. In other words, they had no more option but to refer to public hospitals in order to receive cancer care services.

*"This is a public hospital and thus, we shouldn't have great expectations" (P. 14).*

**Table 1. The main themes and subthemes of the study**

| Subthemes | Main themes | Overarching theme |
|---|---|---|
| 1. Negative attitude towards public hospitals | The shadow of government administration | Lump in throat: the suffering of the parents of children with cancer |
| 2. Parents' non-involvement in the process of treatment | | |
| 3. The role of accommodations in alleviating sufferings | | |
| 4. Poor patient education | | |
| 1. The suffering caused by indetermination | The role of support systems | |
| 2. Seeking for peace and serenity | | |
| 3. Lump in throat | | |
| 4. The effects of other parents' presence | | |

*1.2. Parents' non-involvement in the process of treatment:* According to the participants, there is no effective plan for involving parents in the process of treatment and care delivery. Most of the participants were unfamiliar with the concept of participatory care and considered participation as the execution of physicians' orders and looking after their children. Consequently, they preferred physician-centered approach to treatment and allowed physicians to make all treatment-related decisions.

*"We don't have as much information as our doctors and hence, we ask them to make decisions. Consequently, they make treatment-related decisions based on their own preferences" (P. 3).*

*1.3. The role of accommodations in alleviating sufferings:* Hospitals have to include accommodations and facilities in order to fulfill family members' needs and prevent them from experiencing added suffering and burdens. Nonetheless, most participants complained of the lack of accommodations in hospitals. They noted that not only hospitals provided inadequate accommodations to family members, but also there were limited accommodations and facilities for hospitalized children. They highlighted the significant roles of play and entertainment in boosting sick children's morale, distracting them from their pain and agonies, and enhancing their endurance. Nonetheless, they believed that there were limited recreational and play facilities in hospitals for children.

*"There are no facilities here for family members to take a rest or sleep. We expect hospitals to provide family members at least with a sofa in patients' rooms (P. 11). When my child and I stay here for one week, my child cries a lot for going back home and playing. A play room here can entertain him, provide him with the opportunity to play with other children, and distract his attention from home" (P. 13).*

*1.4. Poor patient education:* According to the participants, hospitals provide no well-organized educations to family members about looking after children with cancer. They noted that they had only received superficial and ordinary educations. Parents who had asked for detailed information had been simply referred to other parents or the internet. Mismatch among information acquired from different sources had also caused some problems for the participating parents. For instance, there was a possibility of disease aggravation due to mismatch between educations provided by a nurse and a resident.

*"They provided us with no education even about how to give a sponge bath to our children. I gradually and personally collected information and understood how to give the bath effectively in order to reduce my child' fever" (P. 11).*

### *2. The role of support systems*

The second main theme of the study was related to the role of support systems. The subthemes of this main theme are explained in what follows.

*2.1. The suffering caused by indetermination:* The major reason behind the participants' fears and concerns was the misconception that '*Cancer is always fatal*'. Parents whose children had only recently developed cancer tended to acquire more detailed information about the disease, its prognosis, and the course of its treatment in order to alleviate their own psychological wounds. However, healthcare providers avoided providing them with the necessary information. Most of the participants complained about the unresponsiveness of healthcare providers, particularly their physicians. Meanwhile, some of the participants believed that healthcare providers' unresponsiveness was advantageous to family members. Participant 14 whose child had been recently hospitalized in the study setting commented:

*"Whenever I ask them about the results of laboratory tests, they answer: 'It is good'. Therefore, I feel compelled to check the results in my child's medical records. They also disagree with and disapprove of me when I check my child's medical records" (P. 14).*

*2.2. Seeking for peace and serenity:* The participants highlighted the importance of having psychological security in hospital settings and noted that hospitals needed to adopt strategies to provide hospitalized children and their family members with such security.

Nonetheless, they were dissatisfied with their psychological security, peace, and serenity in hospitals. Some of them even bitterly complained about lack of silence in hospital wards. In order to alleviate such problems, the participants tended to strengthen their relationships with God rather than seeking help from healthcare providers or other sources of support. Consequently, they noted that in hospital settings, patients and family members needed to have easy access to facilities for doing religious rituals in order to have psychological security. However, they had limited, if any, access to such facilities. Participant 10 referred to the crowdedness and noisiness of hospital settings by saying:

*"We need to feel serene in our patients' rooms. However, the door is always open and many people come and go. Nonetheless, nobody has the permission to close the door because they (hospital staffs) disagree with that" (P. 10).*

Participant 13 also highlighted the need for religious facilities and said:

*"There should be a prayer room here. We need somewhere to worship God, relate with Him, and confabulate to Him. However, there isn't even a prayer book here" (P. 13).*

*2.3. Lump in throat:* The participants' experiences showed that almost in most cases, there had been no strong relationship between them and their healthcare providers, particularly physicians. According to them, the main reason behind such a poor relationship was their inability to establish strong relationship due to lack of information. Some of them also referred to healthcare providers' improper conduct as the reason and noted that the atmosphere of such relationships was tense and full of fear. They avoided criticizing healthcare providers or making complaints because it might result in the discontinuation of the treatments for their children. Therefore, they experienced an added stress due to their inability to communicate with healthcare providers.

*"We ask them but they don't mind. We fear that our insistence results in their obstinacy and ruins our relationships with them. You know, we need to refer to hospital frequently and for a long time and hence, they may avoid providing quality care to our children and fulfilling their needs if we insist on our requests" (P. 10).*

*2.4. The effects of other parents' presence:* Lengthy hospitalization of children with cancer and the need for their parents' constant companionship with them create a need for a source of psychological support. Healthcare providers' heavy workload and their poor relationships with patients and family members made our participants avoid referring to and expecting sympathy from them. Alternatively, they established relationships with each other in order to share their feelings. Most of them noted that the presence of other people with the same problems as their own had positive effects on their morale.

"Here, I see that other hospitalized children have the same problems as my own child. Besides, some mothers share their information about remedies for children's problems. Such factors boost my morale and make me happy" (P. 5).

## Discussion

This study was made to explore hospitalization-related experiences among the parents of children with cancer. One of the study findings was parents' negative attitude towards public hospitals and negative experiences of attending such hospitals so that some of them referred to their poor access to private hospitals as the main reason behind choosing public ones. Poor environmental conditions, healthcare professionals' lack of professional experience, and shortages of equipment and facilities were among the factors behind the participants' negative attitude towards the quality of care services. These findings are in line with the findings of studies made by Amaghionyeodiwe[23] and Amery et al.[24] in Nigeria and Iran, respectively. However, Amery et al. reported that the main

factor behind preferring private hospitals over public ones was the quality of care,[24] while Amaghionyeodiwe noted physical distance and financial issues as the most significant factors.[23]

We also found that parents were not actively involved in the process of treatment and care delivery to their hospitalized children so that they were even almost unfamiliar with the concept and the nature of participation in the treatment of one's own child. They simply defined participation as constant companionship with their hospitalized children and thus, had no significant role in selecting their physicians and deciding on treatment options. One of the major factors behind such poor participation was their lack of knowledge about cancer and its treatments. Almost all the participating parents tended to attend their children's bedside in order to make sure of the quality of care services and believed that such constant attendance had positive effects on themselves and their children. However, Ames et al.[25] and Lam et al.[26] equated participation with lengthy stay in hospital and active involvement in care delivery to children.

Another finding of the study was the role of accommodations in alleviating sufferings. Most of hospitalized children's parents stay in hospitals with their children for long periods of time. Therefore, hospitals are expected to provide them with adequate accommodations during their hospital stay. Creating a favorable environment prevents hospitalized children's parents from experiencing added suffering other than the suffering related to their children's illnesses. Previous studies also showed that environment could affect individuals' behavior. For instance, a favorable environment can help them manage their stress.[27] Besides, findings of the present study revealed the significant roles of play and entertainment in boosting sick children's morale and rendering hospital environment tolerable for them. Bolton and Bass also referred to play therapy as a means for enhancing children's ability to cope with hospital environment and conditions.[28]

The findings also indicated that the parents had limited knowledge about their children's illnesses and received little, if any, educations from healthcare providers. Kirou-Mauro et al. also noted that the major challenge of cancer patients' family members was lack of knowledge about cancer.[29] Children with specific diseases such as cancer are very vulnerable and thus, minor care-related errors may result in serious problems for them. Consequently, as children's chief caregivers, parents need to have and receive detailed information about how to look after them. Other studies have also highlighted the importance of patient and family education and reported that it can positively affect families' ability to evaluate and manage cancer-related pain.[30,31]

Another finding of the current study was related to the effect of other parents' presence. Factors such as healthcare providers' heavy workload and their inattention to families' problems and needs as well as poor relationships between them and parents had prevented the participants from considering healthcare providers as a good source of peace and serenity. However, given to their shared experiences, parents had much stronger relationships with each other. Trimm and Sanford also found that parents who had similar conditions usually supported each other and positively affected each other's morale.[13]

We also found that most of the participants were profoundly shocked by cancer-induced great psychological stress and pressures. In agreement with this finding, Wu et al. reported that the diagnosis of cancer produced many negative effects on children and parents' physical and psychological health.[32] The study participants' major strategy for achieving serenity and alleviating psychological

pressures induced by their children's illnesses was to establish strong relationship with God. Spiritual interventions have been reported by previous studies as effective coping mechanisms for alleviating psychological distress, reducing feelings of anger, guilt, and despair, enhancing inner peace, and boosting hope among the parents of children with cancer.[33,34]

Another finding of the study was indetermination-induced suffering. The main reason behind the participants' indetermination was their lack of knowledge about their children's health status and the prognosis of their illnesses. Naifeh Khoury et al. also reported that Lebanese parents suffered from indetermination and fear over future.[12] Parents of hospitalized children have the absolute right to receive educations about their children's problems. Nonetheless, healthcare providers in the study setting refrained from providing such educations due to uncertainties over the diagnosis of children's problems or in order to avoid adding to parents' stress. Oskouiee and Gavgavni stated that providing information to patients improved the quality of patient care, accelerated recovery, reduced medical errors, prevented rehospitalization, and enhanced patient satisfaction.[35] Wills also found that information provision by physicians calmed anxious and agitated parents.[36]

The other study finding was lump in throat. The unfavorable atmosphere of hospital settings and the critical conditions of their children had brought the participants with awful feelings of fear and anxiety. Lack of psychological support for these parents results in different concerns for them, increases their stress, and reduces their ability to care for their children. Consequently, all the participants noted that they needed a source of adequate support. However, healthcare providers' poor relationships with them had prevented them from receiving support from physicians and nurses. According to Jadidi et al., effective human interactions between parents and healthcare providers help fulfill parents' emotional and psychological needs and indirectly affect the flow of treatments.[20]

## Conclusion

The risks and complications of cancer cause many frustrations and psychological stresses for the parents of children with cancer. Parents should manage these pressures in order to care for their child. The findings of this study revealed that the parents of children with cancer had negative experiences of their children's hospitalization such as healthcare providers' inattention to them and their needs. Besides, they suffer a lack of support, particularly during the early phases of their children's illnesses. It is recommended that these parents become more actively involved in the process of clinical care delivery in order to play a more significant role in their children's recovery from cancer. Moreover, effective systems need to be developed to emotionally and psychologically support these parents.

## Conflict of Interests

Authors have no conflict of interests.

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# Student's characteristics and fast food consumption

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Original Article

## Abstract

**BACKGROUND:** Fast food consumption is one of the risk factors for human health. The present study was conducted with the objective to investigate how students' characteristics (attitude, control beliefs, and normative beliefs) motivate the consumption of fast food.

**METHODS:** In this cross-sectional study, a total number of 401 students of Kurdistan University of Medical Sciences, Sanandaj, Iran, were randomly selected and studied in 2015. A questionnaire was administered to collect information about student's demographic characteristics as well as their attitudes and beliefs towards using fast food. Correlation analysis and multivariate analysis of variance (MANOVA) followed by univariate ANOVA were used to interpret the results.

**RESULTS:** The mean age of participants was 21.20 ± 2.80 years and 254 (67.20%) of them were female. Furthermore, 60.54% of the students were found with tendency to use fast food. The MANOVA analysis showed that the effect of gender on students' characteristics was significant (P = 0.005), however the effect of grade was marginally insignificant (P = 0.053). Post-hoc univariate ANOVA showed that the gender was highly associated with control beliefs (P = 0.030) and normative beliefs (P = 0.004). No significant association was found between gender and student's attitude (P = 0.610).

**CONCLUSION:** A training program for medical students in Kurdistan University of Medical Sciences is recommended to encourage students to reduce the consumption of fast food.

**KEYWORDS:** Attitude, Beliefs, Fast food, Students

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## Introduction

In recent years, chronic diseases such as diabetes mellitus (DM), hypertension, and cardiovascular diseases (CVDs) have been growing. One of the main causes of these diseases is community's inappropriate nutrition. Over the past decade, an increased prevalence of obesity and calorie intake has been proven.[1-3] One obvious reason for that is the tendency to eat meals outside home.[4] One of the important factors influencing the development of chronic diseases is food patterns and habits. For this reason, nowadays, medical sciences consider the nutritional factors as an important aspect of lifestyle causing the growing incidence and spread of the disorders and diseases.[5-7] Controlling the nutritional factors and proper nutrition in different ages can play a key role in prevention and management of the diseases, especially chronic diseases, and the findings of scientific studies have been always emphasizing this

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matter. In recent years, many studies have been carried out in this field indicating that many middle age chronic disorders and illnesses are due to the lack of proper nutrition and imbalances in the consumption of fats among the adolescent and youth.[8-11]

According to studies in the United States, 42% of children and 37% of adults consume fast food. In a scientific definition, attitude can be regarded as having relatively stable feelings, tendencies, or a set of beliefs directed toward an idea, person, or position.[12,13] Self-control beliefs lead to setting goals and creating plans for the chosen behaviors and additionally normative beliefs- the ways in which, one thinks about the expectations of the important people in her/his life, concerning her/his behaviors.[14] For example, type 2 DM is a chronic and very important disease and a major health issue spreading around the world. Giving the high prevalence of DM and its direct and indirect costs, self-control is very important.[15,16] The high and uncontrolled consumption of fast food leads to an increase in the intake of calories, saturated fatty acids, sodium, carbohydrates, and added sugars, while decreasing fiber, vitamins, and minerals intakes. It also increases blood cholesterol and chances of developing chronic and non-contagious diseases such as obesity, CVDs, type 2 DM, osteoporosis, and some cancers.[11,13,15] Considering the lack of such studies in Kurdistan University of Medical Sciences, the aim in this study was to determine the relationship between attitude and beliefs and the consumption of fast food among students of Kurdistan University of Medical Sciences.

## Materials and Methods

This study was a descriptive-analytic cross-sectional study carried out among the students of Kurdistan University of Medical Sciences in 2015. For this study, 401 male and female students were selected and classified by their disciplines. Of the 5 affiliated schools of Kurdistan University of Medical Sciences (medicine, dentistry, nursing and midwifery, paramedical, health), each school was considered as a stratum. Within each stratum, students were randomly selected in proportion to the enrollment size for each entrance year. Participants were asked to complete a questionnaire designed to measure the tendency of students towards eating fast food. The questionnaire was approved in terms of its reliability and validity (Cronbach's alpha = 0.85).[1] To collect information, the questionnaire was divided into two sections. At first section, personal information such as age, gender, grade, and the field of study was collected. The second part included questions based on educational theories of rational and cognitive social activities regarding tendency to consume fast food, as well as attitude, control beliefs, and normative beliefs. For each question, responders had three choices; 'not at all', 'neutral', and 'quite like it'. When collecting data, a multivariate analysis of variance (MANOVA) followed by univariate ANOVA were used to investigate potential association between dependent variables (attitude, control beliefs, and normative beliefs) with student's covariates including age, gender, and grade.

## Results

As the information of 23 of the questionnaires was incomplete, they were removed from the total number. Finally, data on 378 questionnaires were analyzed. The mean age of the participants was 21.20 ± 2.80 years and 254 (67.20%) of them were female. In general, regardless of gender, 60.54% of students tended to eat fast food. In this study, 60.15% of the male students and 60.77% of the female students were interested in eating fast food, so that in most disciplines, more than 60% of students responded positively to the items about consumption of this group of food.

**Table 1. Mean ± standard deviation (SD) of the score of attitudes, control beliefs, and normative beliefs of students studying at Kurdistan University of Medical Sciences, Sanandaj, Iran**

| Component | Attitude | Control beliefs | Normative beliefs |
|---|---|---|---|
| Field | Mean ± SD | Mean ± SD | Mean ± SD |
| Operating Room | 62.07 ± 11.09 | 50.64 ± 9.24 | 12.64 ± 4.69 |
| Midwifery | 61.17 ± 10.05 | 51.65 ± 13.20 | 11.31 ± 5.26 |
| Nursing | 59.56 ± 10.75 | 50.47 ± 9.03 | 15.03 ± 7.09 |
| Radiotherapy | 62.50 ± 7.03 | 46.80 ± 10.20 | 14.30 ± 6.56 |
| Medical Laboratory Sciences | 60.60 ± 10.47 | 51.30 ± 9.27 | 11.94 ± 5.05 |
| Emergency Medical Science | 63.87 ± 8.15 | 51.50 ± 7.78 | 11.62 ± 4.87 |
| Radiology | 62.45 ± 6.15 | 49.36 ± 8.21 | 11.36 ± 4.13 |
| Anesthesiology | 61.76 ± 10.28 | 53.12 ± 8.67 | 11.67 ± 4.05 |
| Public Health | 65.86 ± 12.86 | 55.00 ±10.10 | 14.28 ± 5.75 |
| Occupational Health | 60.08 ± 10.48 | 49.28 ± 11.24 | 14.56 ± 7.65 |
| Environmental Health | 55.44 ± 12.36 | 53.12 ± 9.60 | 10.53 ± 4.49 |
| Health Education | NA* | NA | NA |
| Anatomy | 47.00 ± 2.83 | 40.00 ± 2.83 | 10.50 ± 4.95 |
| Epidemiology | 59.50 ± 2.12 | 52.00 ± 7.07 | 9.00 ± 4.24 |
| Microbiology | NA | NA | NA |
| Immunology | 63.33 ± 11.37 | 52.67 ± 2.52 | 8.00 ± 2.64 |
| Dentistry | 62.95 ± 9.77 | 50.33 ± 8.66 | 12.62 ± 5.02 |
| Molecular Medicine and Genetics | NA | NA | NA |
| Medicine | 58.80 ± 11.44 | 52.69 ± 8.23 | 11.13 ± 4.57 |
| Total | 60.54 ± 10.67 | 51.36 ± 9.62 | 12.73 ± 5.84 |

* Not Available; SD: Standard deviation; Results given with respect to students' field of study

However, fast food consumption among midwifery and immunology students were not very popular. In determining control beliefs and normative beliefs in terms of the underlying variables among the students, based on sexual breakdown, these rates were 49.92%, 13.81% and 52.62%, 12.20% among males and females, respectively. In general, these values were respectively as 51.36% and 73.33% among all students. Attitude, control beliefs, and normative beliefs among the students based on their fields of study and grade are shown in tables 1 and 2.

MANOVA was used to examine the relationship between attitude, control beliefs, and normative beliefs simultaneously with underlying variables of age, gender, and grade. The results are shown in table 3.

Table 3 shows that in a general view and considering the correlation between variables of age, gender, and degree at the 0.050 level, gender had a significant relationship with attitude, control beliefs, and normative beliefs. Grade was significant at the 0.100 level. To understand which variables (attitude, control beliefs, and normative beliefs) had a significant relationship with gender (P = 0.005), one-way ANOVA was used for post-hoc test; the results are shown in table 4.

**Table 2. Mean ± standard deviation (SD) of the Attitude, control beliefs, and normative beliefs among the students according to their educational level**

| Grade | BSc | MSc | PhD | Total |
|---|---|---|---|---|
| Source | Mean ± SD | Mean ± SD | Mean ± SD | |
| Attitude | 61.01 ± 10.49 | 53.17 ± 12.11 | 59.78 ± 10.79 | 60.54 ± 10.67 |
| Control beliefs | 51.18 ± 9.90 | 52.17 ± 9.30 | 52.04 ± 8.40 | 51.36 ± 9.62 |
| Normative beliefs | 13.02 ± 6.02 | 11.83 ± 6.22 | 11.57 ± 4.74 | 12.73 ± 5.84 |

BSc: Bachelor of sciences; MSc: Master of sciences; SD: Standard deviation

**Table 3. Results of multivariate analysis of variance (MANOVA)**

| Source | Statistic F | P |
|---|---|---|
| Age | 0.0639 | 0.978 |
| Gender | 4.2925 | 0.005 |
| Grade | 2.0835 | 0.053 |

Univariate results in table 4 indicated that gender was related to control beliefs and normative beliefs, but it had no relationship with attitude.

## Discussion

Nowadays, due to lifestyle changes, the tendency to eat fast food, especially among young people has increased. The results of this study showed that 60.54% of students in Kurdistan University of Medical Sciences tended to use fast food and in general, at the 0.050 level, the student gender had a significant relationship with attitude and control beliefs. Grade was significant at the 0.100 level. In a study by Barati et al. on the relationship between attitudes, effective beliefs, and consumption of fast food among students of Hamedan University of Medical Sciences, Hamedan, Iran, it was suggested that eating oven-ready foods among male students living in dormitories was higher, indicating the necessity to establish the proper attitudes and beliefs regarding the consumption of oven-ready food among students. In addition, in this study, undergraduate students, students living in hostels, health students, single students, and the students in the age group of 21-25 years with rates of respectively 64.8%, 80.8%, 26.4%, 92.4%, and 65.6% had the highest number of participants, which is consistent with the results obtained in the present study.[1] According to this study, there was a significant relationship between attitude and variables such as having a diet, weight loss, and residence. Normative beliefs had a significant relationship only with gender and educational grades. Males were also more likely to be impressed by the approval of others to consume oven-ready food.[1] In a study conducted by Dadipoor et al. on the factors associated with the consumption of prepared food in Bandar Abbas, it was suggested that 52 of the participants were male and 303 (50.5%) preferred pizza as fast food. People under the age of 25 years had a higher rate of consumption of fast food compared to other age groups. Educated university students consumed more fast food in comparison to the students in other educational grades. In the afore-mentioned study, it was concluded that the consumption of fast food could be observed more in young people with college education, which is similar to the findings of the current study.[17]

**Table 4. Results of post-hoc univariate analysis of variance (ANOVA). In each ANOVA, the score of attitude, control beliefs, and normative beliefs was used as response variable**

| | Source | Coefficient | Standard error | Statistic T | P |
|---|---|---|---|---|---|
| Attitude | Age | 0.171 | 0.212 | 0.806 | 0.421 |
| | Gender (Female) | 0.618 | 1.225 | 0.504 | 0.614 |
| | Grade(MSc) | -8.430 | 3.235 | -2.606 | 0.009 |
| | Grade(PhD) | -1.289 | 1.440 | -0.895 | 0.371 |
| Control beliefs | Age | 0.145 | 0.192 | 0.755 | 0.451 |
| | Gender (Female) | 2.414 | 1.107 | 2.180 | 0.030 |
| | Grade(MSc) | 0.891 | 2.923 | 0.305 | 0.761 |
| | Grade(PhD) | 0.979 | 1.301 | 0.752 | 0.452 |
| Normative beliefs | Age | -0.114 | 0.115 | -0.991 | 0.322 |
| | Gender (Female) | -1.940 | 0.666 | -2.914 | 0.004 |
| | Grade(MSc) | -1.062 | 1.757 | -0.604 | 0.546 |
| | Grade(PhD) | -1.483 | 0.782 | -1.903 | 0.058 |

BSc: Bachelor of sciences; MSc: Master of sciences

In another descriptive cross-sectional study carried out by Najmabadi et al. on the fat composition intakes of daily dietary among students, it was shown that by planning nutritional training and counseling toward increasing nutritional knowledge and awareness, students should be advised on choosing the correct and balanced food patterns. Moreover, regarding planning a diet for a group of people, it was declared that the taste and the selected nutritional style could be modified by applying a proper nutritional pattern including reduction of the dietary fats. Furthermore, other important points in these findings are the existence of a significant statistical difference between the amount of fat intake among male and female students. There was also no statistically significant difference in the composition of fat received between students located in dormitories and at home. In other words, over-intake of fats with similar compositions (supersaturated fats and high cholesterol) was reported in both groups.[10] In a descriptive study conducted by Mirmiran et al. assessing the dietary intake by residents of District 13 of Tehran, Iran, in the age group of 20-59 years old, the male gender was more consistent with the recommendations of the pyramid in milk, dairy, bread, and cereals groups, meanwhile women met this standard in the vegetable and fruit group.[18] In another study entitled "Consumption of fast food in Yazd", Iran, Fazelpour et al. highlighted this issue and suggested reasons for the increased consumption of fast food among students, including living in a dormitory and being away from the family, lack of sufficient skills in cooking, indolence, entertainment, and being impressed by friends. In addition, the results of this study indicated that men were more likely to use oven-ready food compared to women.[19] In the study by Jazayeri, the results showed that eating fast food had been observed in 97.5% of university students and 93.3% of unemployed participants. Therefore, most consumers of fast food were male, young, single, and students. This finding reveals that young people do not have sufficient knowledge and experience about healthy nutrition, and they do not believe that chronic diseases such as DM and high blood pressure may begin at young ages. Hence, the rate of consumption of fast food is too high among them. As people grow older, regarding the increase in knowledge and risk perception, they pay more attention to health.[20]

## Conclusion

Based on the results of this study, 60.54% of students intended to consume fast food. Therefore, it is necessary to establish an intervention to warn students about the harmful consequences of using fast food. Achieving this goal requires appropriate informing, educational programs, and rich cultural practices in this field.

## Conflict of Interests

Authors have no conflict of interests.

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# The role of identity crisis and emotional intelligence in predicting substance abuse among high-school students

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Original Article

## Abstract

**BACKGROUND:** This study was carried out aiming to investigate the identity crisis and emotional intelligence in prediction of addiction susceptibility among students.

**METHODS:** This study was a correlational-descriptive design with the population consisting of all high school students of Tehran City, Iran, in 2017-2018. 358 high school students were selected by cluster sampling method. Instruments for gathering data were identity crisis questionnaire (Ahmadi), emotional intelligence questionnaire (Bradbury-Graves), and tendency to substance use scale. Then, the data were analyzed using SPSS software and statistical tests such as Pearson correlation coefficient and stepwise regression analysis.

**RESULTS:** Based on study findings, there was a statistically significant relationship between identity crisis and emotional intelligence with addiction susceptibility among students. In addition, the results of stepwise regression analysis indicated that social awareness, identity crisis, and relation management significantly predicted 26% of changes in addiction susceptibility.

**CONCLUSION:** By designing psychological interventions based on these variables, one can diminish the probability of substance use in at-risk groups. Theoretical and practical implications of the results presented have been discussed.

**KEYWORDS:** Identity Crisis, Peer Influence, Emotional Intelligence, Substance-Related Disorders, Adolescents

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## Introduction

Adolescence is the most important developmental period associated with the onset and aggravated consumption of substances.[1] The high prevalence of drug use in adolescents, together with the potential consequences of such use, highlights the importance of preventing the onset of drug use, since awareness of the substance abuse problems in adolescents is necessary for the development and improvement of preventive interventions.[2] There is no specific agreement on the root causes of addiction susceptibility, so that the factors associated with substance use and substance abuse are diverse and include individual contexts, family characteristics, and social and environmental factors.[3]

An effective factor in this regard is the identity crisis. The identity crisis is an instrument used by Ericsson to describe the inability of individuals to accept the role that the society expects from them. Moreover, the failure of an individual to shape his or her identity, whether due to undesirable experiences of childhood or the current unfavorable situation, creates a crisis called the identity crisis or loss.[4]

The theoretical basis for the identity of substance users was first introduced in a study on rehabilitation of addicts by Biernack.[5] He

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believed that for a person to recover from addiction, it is necessary to shape identity, perspective, and a new social world. In the same vein, McKeganey et al. reviewed the story of the recovery of 70 addicted individuals and concluded that the identity of addicts was badly damaged.[6]

In addition, emotional intelligence is associated with drug use problems.[7] In this regard, Trinidad and Johnson found that teenagers who were deficient in emotional intelligence skills used alcohol and tobacco more than other teenagers.[8] Hence, the lack of emotional intelligence has been recognized and documented as a potential indicator of alcohol and other substances.[9,10]

Studies conducted in domestic and foreign literature also confirm the importance of the role of emotional intelligence in increasing the likelihood of drug use. In one of these studies, Karimi examined the emotional intelligence among addicted and normal individuals in Tehran, Iran, and concluded that there was a significant difference between the mean of emotional intelligence of addicts and ordinary individuals, so that addicts had a lower mean rate compared to normal people.[11]

Given the above issue, the study of risk (identity crisis) and protective (emotional intelligence) factors in addiction potential among the adolescents can be an effective step in preventing the prevalence of drug use among students. Accordingly, the main question of the present study was whether the identity crisis and emotional intelligence could predict the changes in adolescent addiction potential?

## Materials and Methods

The present study was retrospective in terms of fundamental purpose and descriptive-correlational in terms of data collection type. The statistical population of the study comprised of all the students studying in the public high schools in Tehran during the school years 2013-2019. The whole number of the students was estimated to be more than 150 thousand according to the report of the Directorate of Education in Tehran. To determine the sample size, Krejcie and Morgan[12] table was used. The sample size was estimated to be 384 individuals using the cluster random sampling method. For this purpose, at first, Tehran was divided into four geographic regions: North, South, East, and west, then a school was randomly selected from each region. In the next step, among the schools selected, classes were randomly selected from each field of study.

In order to conduct a field study, the researcher received the necessary permission from the relevant vice presidents by referring to the research, planning, and staffing department of the Education Department and providing explanations on how to conduct the study. After coordination with the selected high school executives, the samples were adopted and the study was carried out on them. In the next step, the researcher presented the nature and objectives of the study to the students and they declared their full satisfaction with collaboration in the study. In addition, all participants were assured that, given the anonymity of the questionnaires, their information and their answers would remain completely confidential, and thus, all individuals entered the research process with informed consent. In order to prevent sample loss, 390 questionnaires were distributed among the subjects.

Completion of each questionnaire lasted about 15 minutes. During the time students were completing the questionnaires, the researcher answered their probable questions. For the field study, in the fall of 2017, questionnaires were distributed to the statistical samples for two weeks. The features of each of the tools used to gather information are presented below.

***Ahmadi's identity-crisis questionnaire:*** Ahmadi and Rezvani Nejhad[13] conducted this

test on 60 high school students in Isfahan, Iran, for validation and confirmed its comprehensibility, expressive and clear questions, and verbal validity. They calculated the reliability coefficient as 0.87 using Split-half method. The questionnaire was again distributed among 30 students and a value of 0.89 was obtained for the correlation coefficient. Then using Spearman-Brown Split Half Reliability Coefficient, the coefficient of validity of the personal identity test was calculated to be 0.92.[13]

***Bradbury-Graves exponential intelligence scale:*** The Bradbury and Graves[14] emotional intelligence questionnaire consisted of two parts: the first part on self-knowledge and self-management skills (individual ability), and the second part on social awareness and relationship management skills focusing on the individual relationships with others (social function). This test consisted of 28 questions each with 6 choices, the answers of which were never, rarely, sometimes, usually, almost always, and always. The validity and reliability of this test in Iran was performed by Hamza Ganji,[15] so that its reliability through re-testing in a group of 36 individuals for the four skills of emotional intelligence and total emotional intelligence was 0.78, 0.86, 0.00, 0.73 and 0.89, respectively. In the other group, the test was performed only once, and its reliability coefficient was obtained as 0.88 for boys and girls and 0.88 for the whole group using Cronbach's alpha.[15]

***Addiction tolerance questionnaire:*** This questionnaire included 16 questions and its overall objective was to measure the inclination to addiction from three social, individual, and environmental dimensions in different individuals. The 5-point Likert scale was used and the range of scores varied between 16 and 80. Achieving a higher score on this scale reflected an individual's increased risk of addiction. Mikaeili[16] in a study on students, calculated the Cronbach's alpha of the questionnaire to be 0.65. After collecting questionnaires, they were scaled and according to the hypotheses, appropriate statistical tests were performed on the data. Considering the conditions for completing the questionnaire including answering all the scales and not using the special order in answering the questions, 358 questionnaires were in a standard condition that were statistically analyzed. The data collected were analyzed using SPSS software (version 23, IBM Corporation, Armonk, NY, USA), Pearson correlation coefficient, and regression analysis.

## Results

358 students participated in this study. The mean ± standard deviation (SD) of the ages of the students was 17.100 ± 0.224. In terms of education, the degree of most of the fathers and mothers of the students was 41.1% and 50.0%, respectively. Moreover, fathers of 9 (2.5%) and mothers of 3 (0.9%) of the students were not alive. The descriptive findings of the study variables are presented in table 1.

**Table 1. Descriptive indexes of study variables**

| Variables | Minimum | Maximum | Mean ± SD |
|---|---|---|---|
| Addiction susceptibility | 17 | 61 | 41.11 ± 10.15 |
| Identity crisis | 14 | 47 | 30.40 ± 7.47 |
| Self-awareness | 2 | 20 | 10.61 ± 3.92 |
| Self-management | 2 | 20 | 10.16 ± 4.02 |
| Social awareness | 7 | 27 | 17.70 ± 4.70 |
| Relationship management | 7 | 28 | 18.03 ± 4.64 |
| Emotional intelligence | 21 | 89 | 56.51 ± 14.92 |

SD: Standard deviation

**Table 2. Correlation matrix of study variables**

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1.Identity crisis | 1 | | | | | | |
| 2. Self-awareness | -0.036 | 1 | | | | | |
| 3. Self-management | -0.143* | 0.708* | 1 | | | | |
| 4. Social awareness | -0.186* | 0.579* | 0.659* | 1 | | | |
| 5. Relationship management | -0.077* | 0.555* | 0.645* | 0.788* | 1 | | |
| 6. Emotional intelligence | -0.131* | -0.809* | -0.864* | -0.890* | -0.879* | 1 | |
| 7. Addiction susceptibility | 0.381* | -0.194* | -0.311* | -0.385* | -0.352* | -0.366* | 1 |

* P < 0.010

To investigate the relationship between two variables, Pearson correlation coefficient was used for parametric test. The results of Pearson correlation matrix indicated a significant relationship between predictive variables with the variable of addiction tendency criterion. Moreover, there was a positive and significant relationship between student identity crisis and student addiction. Furthermore, the relationship between emotional intelligence and its components with negative attitude was significant (Table 2).

Regression analysis was employed to determine the contribution of each of the predictor variables in explaining the variance of students' addiction (Table 3).

The results showed that in the third step, the variable predicting the relationship management (a subscale of emotional intelligence) was the last variable included in the analysis. The correlation coefficient calculated in this step was 0.511, with a coefficient of determination (COD) of 0.261. The obtained F-value showed that the calculated regression model was significant at 99% confidence level.

The addiction susceptibility was explained by three variables: social consciousness predictor, identity crisis, and relationship management. The beta value was used to predict the direct identity crisis, social awareness, and management of relationships in the direction of addiction susceptibility. In other words, by increasing social awareness and managing relationships, the amount of addiction tendency in the sample group of the study was reduced, and as the identity crisis rose, the addiction tended to increase alongside it.

**Table 3. Results of stepwise regression analysis in predicting addiction tendency based on predictive variables**

| Step | Predictors variables | B | β | R | $R^2$ | F | P | Collinearity | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tolerance | VIF |
| 1 | Constant | 55.79 | - | | | | | - | - |
| | Social awareness | -0.829 | -0.385 | 0.385 | 0.148 | 61.77 | < 0.001 | 1.000 | 1.000 |
| 2 | Constant | 40.27 | - | | | | | - | - |
| | Social awareness | -0.700 | -0.325 | 0.497 | 0.247 | 58.24 | < 0.001 | 0.965 | 1.036 |
| | Identity crisis | 0.435 | 0.321 | | | | | 0.965 | 1.036 |
| 3 | Constant | 41.39 | - | | | | | - | - |
| | Social awareness | -0.370 | -0.172 | | | | | 0.363 | 2.755 |
| | Identity crisis | 0.454 | 0.334 | 0.511 | 0.261 | 41.60 | < 0.001 | 0.952 | 1.050 |
| | Relationship management | -0.418 | -0.191 | | | | | 0.374 | 2.675 |

VIF: Variance inflation factor

## Discussion

Based on the characteristics of individuals with identity crisis, it can be concluded that due to problems in coping styles and ability to solve problems and lack of a clear path to their lives, as well as lack of codified program to achieve goals in life among these individuals, tendency to drug abuse is not unexpected.[17] Given other findings of this study, there was a significant relationship between emotional intelligence and tendency to drug abuse among adolescents. The results of the studies by Karimi[11] and Nehra et al.[18] also revealed the effect of emotional intelligence on substance use, which was consistent with the findings of the present study. Dunn believes that one of the great benefits of emotional intelligence is avoiding isolation.[19] This means that establishing new relationships and maintaining the effective relationships of the past through empathy and communicative skills will provide a context for avoiding isolation and addiction potential and preventing individuals from resorting to drug use. Individuals lacking ability to use their emotional intelligence skills are more likely to use other methods that are less effective to manage their mood, and they are likely to become anxious, depressed, and addicted to drugs. In fact, high emotional intelligence is an important supportive factor against stress. Regarding addiction, as declared in the study by Bradbury and Graves,[14] when people are pushed by friends, effective emotional management as one of the components of emotional intelligence reduces the potential of consumption. The ability to manage excitements makes it possible for an individual to use coping strategies in high-risk recipients. People with high emotional intelligence are more likely to predict the wishes of others (social awareness). They better understand unwanted pressures from their peers and their excitement, and thus resist to drug use; on the other hand, those with low emotional intelligence generally tend to substance abuse to relieve their negative emotions.[8] In the regression model of the present study, both emotional intelligence and identity crisis could explain the variance of the variables of addiction tendency criterion.

## Conclusion

Considering identity as its specific definition including the values, goals, and beliefs that a person is committed to, one can explain the interaction between the identity crisis and the emotional intelligence. In the context of the study limitations, the use of self-assessment tools in the field of addiction and associated problems can always be accompanied by a bias in response, which can potentially impact the results.

## Conflict of Interests

Authors have no conflict of interests.

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# Evaluating the relationship between sexual function and marital satisfaction in married Kurdish women in year 2016

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Original Article

## Abstract

BACKGROUND: Sexual satisfaction and ultimately marital satisfaction have a significant role in couples' adaptation. The aim of this study was to evaluate the relationship between sexual function and marital satisfaction of married Kurdish women referred to health centers in Sanandaj, Iran, in 2016.

METHODS: This cross-sectional study was conducted on 500 married women referred to health centers in Sanandaj City in 2016. Sexual function information was collected using the standard Female Sexual Function Index (FSFI) questionnaire. In order to investigate the marital satisfaction, the ENRICH Marital Satisfaction Inventory (MSI) was also used. Data were analyzed using SPSS software. Pearson correlation test and one-way analysis of variance (ANOVA) were used.

RESULTS: In terms of adultery scales, the sexual satisfaction for majority of women was moderate. The average score of sexual satisfaction was 20.37 ± 8.40 from 36. Between sexual satisfaction with age (r = 0.223) and spouse's age (r = 0.26), correlation was inversely significant (P = 0.0001). Sexual function was significantly correlated with the level of adultery scales including sexual satisfaction, communication, conflict resolution, and ideal distortion (P < 0.0500).

CONCLUSION: Given that sexual performance in this study was moderate and there was a relationship between sexual satisfaction and marital satisfaction, sexual education and counseling to women and men during marriage by health and social systems is recommended.

KEYWORDS: Coitus, Sexual Behavior, Orgasm

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## Introduction

All laws and social organizations are working to preserve the family and its sanctity. Marriage, as the most important social contract, has always been approved to meet the emotional and security needs of individuals.[1] Marriage is a social union and the first step to form family,[2] and it has been described as an event which involves the cohabitation of two people with different characteristics and needs.[3] In religious societies such as Iran, marriage is the only social system that provides a place for satisfying sex.[1] Personal characteristics, intellectual maturity, mental balance, mutual understanding, financial factors, adaptability, sexual satisfaction, love,

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and affection are the most significant factors affecting marital satisfaction.[4]

Marital satisfaction is considered as the important factor that affects the family completely[5] and has been described as a sense of happiness that couples have most of the times.[6] Safe and pleasurable sexual relationship is among the most important factors affecting marital satisfaction.[7] Considering the importance of marital satisfaction, several studies have been conducted previously.[8,9] Therefore, marital satisfaction is the important and fundamental factor that sustains the marital life and is affected by sexual satisfaction.[1] Previous studies introduced a variety of variables that predicted the marital satisfaction and the most widely-documented variable in the research literature associated with marital satisfaction was sexual satisfaction.[10]

Dogan et al. evaluated the relationship between sexual quality of life and life satisfaction in married Turkish women. They concluded that high sexual quality of life had a positive effect on life satisfaction in married Turkish women.[11] In a study by Ziaee et al., marital satisfaction was significantly associated with sexual satisfaction in employed married women at Golestan University of Medical Sciences, Gorgan, Iran.[7]

Many of the sexual disorders such as reduced sexual desire, sexual disability, and premature ejaculation which remain hidden because of fear, anxiety, shame, and embarrassment or feelings of incompetence and sin, cause other complications such as physical impairment, depression and dissatisfaction with marital life, and finally divorce.[12] Basson et al. showed that 25% to 63% of the general population had a sexual problem,[13] while another study found this to be 25%.[14] Pasha and Hadj Ahmadi showed that sexual desire and sexual intercourse were significantly decreased in pregnant women in Iran,[15] and in a study by Mohammadi et al., 83% of Iranian women had sexual dysfunction.[16]

One of the major problems is the lack of adequate information on sexual issues and inappropriate attitudes and beliefs about this issue among families, particularly in newly-married couples which has resulted in the ruin of many families.[17] Considering the influence of many factors such as race, culture, religion, and etc. on sexual satisfaction,[18] this study was conducted to evaluate the relationship between sexual function and marital satisfaction of married Kurdish women referred to health centers in Sanandaj, Iran, in 2016.

## Materials and Methods

This cross-sectional study was conducted on 500 married women referred to health centers in Sanandaj City in 2016. To distribute samples in Sanandaj City, 8 out of 20 health centers of Sanandaj were selected randomly; then 65 women were selected from each health center. The purpose of the project was explained to all married literate women. With respect to the confidentiality of information, standard questionnaires including Female Sexual Function Index (FSFI) and ENRICH Marital Satisfaction Inventory (MSI) were delivered to women. Adequate explanations on how to complete them were given to women.

The FSFI is a brief, self-report measure of female sexual function. It has 19 items and six domains of sexual function including: desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items). For desire domain, scores 1-5 were considered, while for other domains (arousal, lubrication, orgasm, satisfaction, and pain) scores 0-5 were considered. Zero score indicates that the person has not had sexual activity during the last 4 weeks. By scaling up the scores of the six domains, the total score is obtained. Higher scores mean better sexual performance.[19]

In order to investigate the marital satisfaction, ENRICH MSI was used. This tool

is a brief measure of marital quality for married adults. The ENRICH inventory is a multidimensional inventory for measuring marital satisfaction that includes 12 category scales including: idealistic distortion, marital satisfaction, personality issues, communication, conflict resolution, financial management, leisure activities, sexual relationship, children and parenting, family and friends, equalitarian roles, and religious orientation. The MSI was evaluated for internal consistency and test-retest reliability. Cronbach's alpha revealed an internal reliability of 0.86. Test-retest reliability was assessed with 115 individuals over a period of 4 weeks. The reliability coefficient over time was 0.86.[20] Likert scale was used for scaling MSI including: (fully agree), (agree), (neither agree nor disagree), (disagree), and (completely disagree).[21]

The principle of confidentiality of information was observed and also written consent was obtained from participants. Data were analyzed using SPSS software (version 18, SPSS Inc., Chicago, IL, USA). Pearson correlation test and one-way analysis of variance (ANOVA) were used.

## Results

Demographic characteristics showed that the mean and standard deviation (SD) of women's age was 32.4 ± 8.4 years and for their spouses was 36.1 ± 8.5 years. Total of 218 (43.6%) women had academic education and 348 (69.6%) were housewife, while 243 (48.6%) of their spouses were self-employed and 224 (44.8%) had academic education. The mean and SD of women's marriage age was 22.6 ± 4.8 years (Table 1).

According to marital satisfaction scales, in 455 (91.0%) women sexual satisfaction was moderate. Also communication for 347 (69.6%), conflict resolution for 362 (72.4%), and ideal distortion for 312 (62.4%) women were moderate (Table 2).

**Table 1. Demographic characteristics of women**

| Variable | | Mean ± SD |
|---|---|---|
| Age (year) | | 32.40 ± 8.40 |
| Spouse's age (year) | | 36.10 ± 8.50 |
| Marriage age (year) | | 22.60 ± 4.80 |
| The age of the first pregnancy (year) | | 24.80 ± 4.60 |
| Gravida | | 1.54 ± 1.02 |
| Number of children | | 1.03 ± 0.83 |
| Abortion | | 0.37 ± 0.75 |
| | | n (%) |
| Women's education level | Elementary | 30 (6.0) |
| | Middle school | 36 (7.2) |
| | High school | 216 (43.2) |
| | Academic | 218 (43.6) |
| Men's education level | Elementary | 34 (6.8) |
| | Middle school | 48 (9.6) |
| | High school | 194 (38.8) |
| | Academic | 224 (44.8) |
| Women's job | Housewife | 348 (69.6) |
| | Employed | 152 (30.4) |
| Men's job | Unemployed | 14 (2.8) |
| | Worker | 70 (14.0) |
| | Employed | 173 (34.6) |
| | Self-employed | 243 (48.6) |
| Household income | Enough | 99 (19.8) |
| | Somewhat enough | 317 (63.4) |
| | Inadequate | 84 (16.8) |
| Forced marriage | Yes | 25 (5.0) |
| | No | 475 (95.0) |

SD: Standard deviation

The mean of sexual satisfaction was 20.37 ± 8.40 out of 36 (Table 3). There was an inversely significant correlation between sexual satisfaction with age (r = 0.223) and spouse's age (r = 0.260) (P = 0.0001) (Table 4).

**Table 2. The frequency of marital satisfaction scales levels in women**

| Adultery scales | Low [n (%)] | Moderate [n (%)] | High [n (%)] | Very high [n (%)] |
|---|---|---|---|---|
| Sexual satisfaction | 3 (6.0) | 455 (91.0) | 42 (8.4) | 0 |
| Communication | 13 (2.6) | 347 (69.4) | 140 (28.0) | 0 |
| Conflict resolution | 8 (1.6) | 362 (72.4) | 126 (25.2) | 4 (8.0) |
| Ideal distortion | 107 (21.4) | 312 (62.4) | 67 (13.4) | 14 (2.8) |

**Table 3. The mean of sexual function indices in women**

| Sexual function indices | Mean ± SD |
|---|---|
| Arousal | 3.31 ± 1.82 |
| Lubrication | 3.16 ± 1.46 |
| Orgasm | 3.88 ± 2.02 |
| Satisfaction | 4.12 ± 2.07 |
| Pain | 2.37 ± 1.22 |
| Total | 20.37 ± 8.40 |

The maximum score of each item was 6, and the maximum total score was 36.
SD: Standard deviation.

Sexual function was significantly correlated with the level of marital satisfaction scales including sexual satisfaction, communication, conflict resolution, and ideal distortion ($P < 0.0500$) (Table 5).

## Discussion

The aim of the present study was to evaluate the relationship between sexual function and marital satisfaction of married Kurdish women referred to health centers in Sanandaj City in 2016. The results of our study showed that the marital satisfaction in 0.6% of women was low, in 91.0% was moderate, and in 8.4% was high. In terms of marital satisfaction scales, the sexual satisfaction was 91.0%, communication was 69.6%, conflict resolution was 72.4%, and ideal distortion was 62.4%, which showed moderate satisfaction level in women. The results of a study by Ziaee et al. showed that the majority of the participants (63.6%) were very satisfied and none of them were very unsatisfied in terms of marital satisfaction scale.[7] Baneian et al. showed that 36.6% of women referring to health care centers in Borujen City, Iran, were relatively satisfied with their marriage, 14.2% were strongly dissatisfied, and 13.9% had strong marital satisfaction.[22] Moreover, Sadegh Moghadam et al. showed that the mean of marital satisfaction score in employed women and their husbands was 3.6 and in housewives and their husbands was 3.7 out of 5.[23] In a study by Jamali et al., the marital satisfaction in 19.5% of women was low, in 70.4% was moderate, and in 10.1% was high.[24] According to mentioned previous studies and our findings, it seems that married Kurdish women are satisfied with their marital life.

In our study, the average score of sexual satisfaction for most participants (91.0%) was 20.37 ± 8.40 out of 36, which was moderate. Sexual function indices for arousal, lubrication, orgasm, satisfaction, and pain were 3.30, 3.16, 3.89, 4.24, and 2.32 out of 6, respectively, which were moderate. In a study by Tavakol et al., the majority of study subjects (58.2%) had moderate sexual satisfaction.[18]

In a meta-analysis conducted by Ranjbaran et al. based on the random effects model, the prevalence of Iranian female sexual dysfunction was 43.9%. The prevalence of desire, arousal, lubricating, orgasmic, satisfaction, and pain disorders were 42.7%, 38.5%, 30.6%, 29.2%, 21.6%, and 40.1%, respectively.[25]

In a study by Raeisi et al., 80.6% of women reported sexual dysfunction. Sexual function indices were reported as: 50.0% low sexual desire, 58.3% low sexual arousal, 36.1% decreased lubrication, 44.0% orgasmic disorder, 52.8% sexual pain disorder, and 41.7% sexual dissatisfaction.[26]

**Table 4. The correlation between sexual function indices in women**

| Sexual function indices | Lubrication | Orgasm | Satisfaction | Pain | Total score |
|---|---|---|---|---|---|
| Arousal | 0.802 | 0.917 | 0.888 | 0.642 | 0.938 |
| Lubrication | 1 | 0.853 | 0.864 | 0.840 | 0.916 |
| Orgasm | | 1 | 0.945 | 0.661 | 0.964 |
| Satisfaction | | | 1 | 0.733 | 0.970 |
| Pain | | | | 1 | 0.790 |

The calculated P values were as < 0.0001 for all the studied items.

**Table 5. The relationship between sexual function score and marital satisfaction scales**

| Marital satisfaction scales | | Sexual function score Mean ± SD | f | P |
|---|---|---|---|---|
| Sexual satisfaction | Low | 3.00 ± 0.00 | 6.54 | 0.0020 |
| | Moderate | 20.43 ± 8.47 | | |
| | High | 20.71 ± 6.98 | | |
| | Very high | 0 | | |
| Communication | Low | 18.94 ± 8.50 | 17.17 | 0.0001 |
| | Moderate | 22.14 ± 2.60 | | |
| | High | 26.70 ± 7.64 | | |
| | Very high | 0 | | |
| Conflict resolution | Low | 18.98 ± 8.82 | 13.12 | 0.0001 |
| | Moderate | 20.35 ± 1.44 | | |
| | High | 24.27 ± 6.20 | | |
| | Very high | 21.50 ± 0.00 | | |
| Ideal distortion | Low | 52.48 ± 3.00 | 22.78 | 0.0001 |
| | Moderate | 19.35 ± 9.12 | | |
| | High | 16.32 ± 8.15 | | |
| | Very high | 14.91 ± 2.08 | | |

SD: Standard deviation

The findings of our study were not inconsistent with those of Raeisi et al.,[26] because the population of study in Raeisi et al.[26] study was women with obsessive-compulsive disorder (OCD) and ours was healthy women.

In our study, we found an inversely significant correlation between sexual satisfaction with women's age and their spouses' age. Rahmani et al. found that marital satisfaction significantly related to sexual satisfaction. They also reported that the age difference of couples related to marital satisfaction significantly.[4] Ziaee et al. also reported a significant association between sexual satisfaction and age.[7] In a review study by Shahhosseini et al., age was reported as one of the important factors in sexual satisfaction in women.[27]

Sexual function was significantly correlated with the level of marital satisfaction scales including sexual satisfaction, communication, conflict resolution, and ideal distortion. Baneian et al. showed that the most difficult problem for women in marital satisfaction was their communication with their husbands. They also reported that as the level of education increased (men and women), their marital satisfaction also increased.[22] In contrast, Mazloomy Mahmoodabad et al. found no relationship between marital satisfaction and education level of women and their husbands.[28]

## Conclusion

Given that the sexual function in this study was moderate and there was a relationship between sexual satisfaction and marital satisfaction, sexual education and counseling to women and men during marriage by health and social systems is recommended.

## Conflict of Interests

Authors have no conflict of interests.

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# Comparison of different components of executive functions in children with attention-deficit/hyperactivity disorder, children with specific learning disorders, and normal children

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Original Article

## Abstract

**BACKGROUND:** The present study was conducted with the aim of examining and comparing different components of executive functions (inhibitory control, cognitive flexibility, working memory, planning) of 3 groups of children with attention-deficit/hyperactivity disorder (ADHD), children with specific learning disorder (LD), and normal children.

**METHODS:** Statistical society of the study included all 7-12 year-old students of Lordegan City, Iran, in the school year of 2015-2016. To carry out this study, 26 normal children were selected by multistage cluster sampling method and 22 children with ADHD and 18 children with specific LD through convenience sampling method. The causal-comparative method was exploited to perform the study. The tools used included clinical interview, Conners questionnaire, the forms filled in by the teachers of children with ADHD, Stroop Color and Word Test (SCWT), and the Tower of London (TOL), active memory, and Wisconsin cards. The analysis was performed using SPSS software with descriptive and inferential statistics [multivariate analysis of variance (MANOVA)].

**RESULTS:** The results showed that, children with ADHD and specific learning disability were lower in 3 areas of performance of working memory, planning, and inhibition performance in comparison to the normal group, however there was no significant difference among groups in terms of flexibility performance.

**CONCLUSION:** In this study, it has been shown that the problems emerging among the exceptional children studied in this study, namely, children with ADHD, and children with learning disabilities, are rooted in their brain functions.

**KEYWORDS:** Executive Function, Attention Deficit Hyperactivity Disorder, Specific Learning Disorder

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## Introduction

Attention deficit/hyperactivity disorder (ADHD) is one of the most common psychological disorders among children and teenagers that is shown by three main signs including chronic problems in controlling attention, excessive action, and impulsivity. Different rates have been reported regarding the prevalence of this disorder. For instance, some researchers declared that ADHD occurs in 3-7% of school children and 5% of adults.[1] Finally, based on Diagnostic and Statistical Manual of Mental Disorders (DSM-5), 5% of children and 5.2% of adults have ADHD, with boys facing this disorder 2 times more than girls and also men facing it 1.6 times more than women.[2]

Students with learning deficits are a huge subgroup of students with special needs. The main sign of students with learning disorder (LD) is loss of concentration and defect in attention and memory.[3]

Based on the reports released by education department of the United States of America

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(USA), 4.3% of all registered students in 2003 have LD.[4] LD affects almost all aspects of students' lives and is a long-lasting problem. LD in educational occasion may have outcomes in other aspects. For example, this ability can also affect daily activities as weak memory, weak deduction, and low ability in solving problems is because of the neurobiological problems among individuals. In addition, executive functions, social relationships, and emotional activeness could be influenced by this ability.[5]

Executive function is a general term that refers to mental process, controlling ability of a body, cognition, and excitement to guide the behavior toward the goal.[6]

Dawson and Guare categorized the most important functions into scheduling, organizing, working memory, time management, response inhibition, task initiation, and target-based resistance.[7]

Related processes include inhibitory control, active memory, as well as language and general memory capabilities.[8]

Any defect in the development of executive functions can cause attention deficit disorders, hyperactivity disorder, or disruption in planning for beginning and completing a task, memorizing a task, memory impairment, and LD.[9] One of the problems of children with LDs that attracts the attention of researchers and experts is executive functions and attention. The low performance of children with learning disabilities in executive functions and attention has been reported in numerous studies.[10,11] Executive function and attention have been the center of attention of recent neuropsychological theories regarding children encountering the risk of disability, particularly children with learning deficiency and ADHD. The main purpose in this study was to compare the functioning of active memory and planning among children with ADHD, children with special learning disabilities, and normal children.

## Materials and Methods

The present study is structural in terms of purpose and descriptive cross-sectional in terms of data collection method with a comparative causal type. According to research topic, active memory functions and scheduling were regarded as dependent variables and the groups under study as independent variables. The statistical population of the study included all students of elementary schools (7-12 years old) in Lordegan City, Iran, who were studying in the academic year 2015-2016. The number of samples for the study was 66 individuals in three groups consisting of normal cases, cases with ADHD, and cases with LDs with 26, 22, and 18 children, respectively. In order to collect the sample in this study, a specific method was used for each sample group and the convenience sampling method was used to choose samples. Since the study was conducted in a small city, there was no possibility of selecting a large sample group. It should be noted that studies using convenience sampling method will always have general limitations.

Using convenience sampling, 22 children with ADHD and 18 children with learning disabilities were selected by referring to counseling centers and clinics and center for LDs in Lordegan, and these 2 groups were regarded as the statistical sample. In addition, the multistage cluster sampling method was utilized for selecting normal children.

***Tower of London (TOL) test:*** this test is one of the important tools for measuring performance of planning and organizing. The reliability coefficient of this test has been reported to be 0.86 through a re-test, moreover, its validity by means of cross-correlation test between subtest and verbal, practical, and total test has been calculated as 0.78, 0.74, 0.80, respectively.[12]

***Working memory index (WMI):*** this test is one of the subscales of Wechsler Memory Scale

(WMS) (3rd edition) and contains 2 small scales: 1. sequence of numbers and letters which is a vocal task by which working acoustic memory is measured, and 2. spatial area which is a visual task measuring working spatial memory. The first form of WMS has been translated and adjusted in Iran and has been standardized on 1007 individuals with a confidence level of 0.85 on the population living in Tehran in 9 age groups.[13]

To analyze the data, descriptive and inferential statistics were used. The descriptive statistics were employed for reporting central index and mean dispersion and standard deviations (SD) of the study variables. Besides, inferential statistics of multivariate analysis of variance (MANOVA) test and post-hoc Tukey test were exploited for analyzing the study questions. Analyzing the data collected through the study questionnaires was carried out using SPSS statistic software (version 23, IBM Corporation, Armonk, NY, USA).

## Results

In this study, 22 children with ADHD, 18 children with learning disabilities, and 26 healthy children participated. The mean ± SD of the age of the participants was 9.01 ± 1.33 years. One-way ANOVA showed no significant difference in age between the three groups ($P < 0.050$, $F = 0.446$). In terms of gender, the groups were peer groups. The MANOVA test was used in order to compare the working memory of children with ADHD and children with specific LDs with normal children. The MANOVA test was primarily performed, which revealed that there were significant differences in memory test subscales for measuring performance of working memory between groups, with the results of MANOVA and post-hoc Tukey tests presented in table 1 for exact examination of the position of the differences. Groups were matched for age and sex. As a result, the effect of age and gender differences was controlled.

According to the results presented in table 1, there was a significant difference between the two groups of normal children and children with ADHD in progressing acoustic memory as the probability value was less than the determined alpha value ($\alpha = 0.05$).

There was no difference in the paired comparison between normal children and children with specific LD. In addition, there was no significant relationship between the two clinical groups of children with specific learning deficiency and children with ADHD. A paired comparison between groups in inverse auditory memory indicated that there was a significant difference between the normal group with children with ADHD and children with specific LDs since the probability value was lower than the determined alpha value. This difference was not observed between the group with ADHD and the group with specific LDs. The same result was obtained for acoustic memory area, so that normal children had a significant difference with children with specific LD and ADHD, however this difference was not observed between the two groups. In visual memory and inverse visual memory area, normal children indicated a better performance compared to the hyperactive children and the probability for paired comparison between these two groups showed a significant difference in accordance with the alpha value determined. Nevertheless, no significant difference was observed between the two groups of normal and specific LD as well as the two groups of ADHD and specific LDs. In progressing visual memory, the normal group had a significant difference with the two groups of ADHD and LDs, however a difference was not observed between the two clinical groups. In order to compare the planning performance, the MANOVA test was performed, and it was revealed that there was a significant difference between groups in subscales of TOL test for measuring planning performance, with the results of MANOVA and post-hoc Tukey tests presented in table 2 for exact examination of the position of the differences.

**Table 1. Results of multivariate analysis of variance (MANOVA) test and post-hoc Tukey test along with the scores of the three groups in working memory**

| Variable | df | MS | F | P | Reference group | Compared group | Mean difference | SE | P |
|---|---|---|---|---|---|---|---|---|---|
| Progressing acoustic | | | | | Normal | ADHD | 1.53 | 0.429 | 0.002 |
| | | | | | | LD | 0.85 | 0.454 | 0.153 |
| | 2 | 14.127 | 6.430 | 0.003 | ADHD | Normal | -1.53 | 0.429 | 0.002 |
| | | | | | | LD | -0.38 | 0.471 | 0.329 |
| | | | | | LD | Normal | -0.85 | 0.454 | 0.153 |
| | | | | | | ADHD | 0.68 | 0.471 | 0.329 |
| Inverse acoustic | | | | | Normal | ADHD | 1.58 | 0.408 | 0.001 |
| | | | | | | LD | 0.41 | 0.439 | 0.005 |
| | 2 | 17.910 | 9.038 | < 0.001 | ADHD | Normal | -1.58 | 0.408 | 0.001 |
| | | | | | | LD | -0.17 | 0.447 | 0.926 |
| | | | | | LD | Normal | -1.41 | 0.432 | 0.005 |
| | | | | | | ADHD | 0.17 | 0.447 | 0.926 |
| Acoustic memory area | | | | | Normal | ADHD | 1.73 | 0.489 | 0.002 |
| | | | | | | LD | 1.52 | 0.518 | 0.013 |
| | 2 | 21.335 | 7.477 | 0.001 | ADHD | Normal | -1.73 | 0.489 | 0.002 |
| | | | | | | LD | -0.22 | 0.537 | 0.914 |
| | | | | | LD | Normal | -1.52 | 0.518 | 0.013 |
| | | | | | | ADHD | 0.22 | 0.537 | 0.914 |
| Progressing visual | | | | | Normal | ADHD | 1.12 | 0.457 | 0.044 |
| | | | | | | LD | 1.74 | 0.484 | 0.002 |
| | 2 | 17.395 | 6.989 | 0.002 | ADHD | Normal | -1.12 | 0.457 | 0.044 |
| | | | | | | LD | 0.62 | 0.501 | 0.435 |
| | | | | | LD | Normal | -1.74 | 0.484 | 0.002 |
| | | | | | | ADHD | -0.62 | 0.501 | 0.435 |
| Inverse visual | | | | | Normal | ADHD | 1.00 | 0.311 | 0.006 |
| | | | | | | LD | 0.23 | 0.329 | 0.763 |
| | 2 | 6.344 | 5.514 | 0.006 | ADHD | Normal | -1.00 | 0.311 | 0.006 |
| | | | | | | LD | -0.77 | 0.341 | 0.068 |
| | | | | | LD | Normal | -0.23 | 0.329 | 0.763 |
| | | | | | | ADHD | 0.77 | 0.341 | 0.068 |
| Visual memory area | | | | | Normal | ADHD | 1.30 | 0.372 | 0.002 |
| | | | | | | LD | 0.80 | 0.394 | 0.113 |
| | 2 | 10.400 | 6.311 | 0.003 | ADHD | Normal | -1.30 | 0.372 | 0.003 |
| | | | | | | LD | -0.51 | 0.408 | 0.436 |
| | | | | | LD | Normal | -0.80 | 0.394 | 0.113 |
| | | | | | | ADHD | 0.51 | 0.408 | 0.436 |

df: Degree of freedom; MS: Mean square; SE: Standard error; LD: Learning disorder; ADHD: Attention deficit/hyperactivity disorder

The results of table 2 shows that there was a difference in total results (total score) in TOL test among the three groups. The results of post-hoc Tukey test indicated that there was a significant difference between the normal children group in the TOL test and the two groups of children with ADHD and children with specific LDs, due to the 99% probability amount in paired comparison of normal group with ADHD group and normal group with specific learning deficiency group. Moreover, the results of MANOVA showed that there was a significant difference in the number of errors between the three groups. The results of post-hoc Tukey test showed a significant difference between normal children and children with ADHD, though there was no significant difference between the two groups of normal children and children with specific LD as well as the two groups of ADHD and specific LD.

**Table 2. Results of multivariate analysis of variance (MANOVA) test and post-hoc Tukey test along with the scores of the three groups in Tower of London (TOL) test**

| Variable | df | MS | F | P | Reference group | Compared group | Mean difference | SE | P |
|---|---|---|---|---|---|---|---|---|---|
| Progressing acoustic | 2 | 19371.7 | 0.446 | 0.642 | Normal | ADHD | -15.42 | 60.389 | 0.965 |
| | | | | | | LD | 45.31 | 63.920 | 0.759 |
| | | | | | ADHD | Normal | 15.42 | 60.389 | 0.965 |
| | | | | | | LD | 60.73 | 66.255 | 0.632 |
| | | | | | LD | Normal | -45.31 | 63.920 | 0.759 |
| | | | | | | ADHD | -60.73 | 66.255 | 0.632 |
| Inverse acoustic | 2 | 721.30 | 0.072 | 0.931 | Normal | ADHD | 10.91 | 29.036 | 0.925 |
| | | | | | | LD | 6.43 | 30.734 | 0.977 |
| | | | | | ADHD | Normal | -10.91 | 29.036 | 0.925 |
| | | | | | | LD | -4.57 | 31.856 | 0.989 |
| | | | | | LD | Normal | -6.43 | 30.734 | 0.977 |
| | | | | | | ADHD | 4.57 | 31.856 | 0.989 |
| Acoustic memory area | 2 | 21050.8 | 0.955 | 0.390 | Normal | ADHD | -5.12 | 43.010 | 0.922 |
| | | | | | | LD | 54.15 | 45.525 | 0.464 |
| | | | | | ADHD | Normal | 5.12 | 43.010 | 0.922 |
| | | | | | | LD | 59.27 | 47.187 | 0.425 |
| | | | | | LD | Normal | -54.15 | 45.525 | 0.464 |
| | | | | | | ADHD | -59.27 | 47.187 | 0.425 |
| Progressing visual | 2 | 422.5 | 3.868 | 0.026 | Normal | ADHD | -8.02 | 3.028 | 0.027 |
| | | | | | | LD | -6.12 | 3.205 | 0.145 |
| | | | | | ADHD | Normal | 8.02 | 3.028 | 0.027 |
| | | | | | | LD | 1.91 | 3.322 | 0.834 |
| | | | | | LD | Normal | 6.12 | 3.205 | 0.145 |
| | | | | | | ADHD | -1.91 | 3.322 | 0.834 |
| Inverse visual | 2 | 107.9 | 4.607 | 0.014 | Normal | ADHD | 3.19 | 1.402 | 0.024 |
| | | | | | | LD | 3.59 | 1.848 | 0.048 |
| | | | | | ADHD | Normal | -3.79 | 1.402 | 0.024 |
| | | | | | | LD | -0.20 | 1.538 | 0.991 |
| | | | | | LD | Normal | -3.59 | 1.484 | 0.048 |
| | | | | | | ADHD | 0.20 | 1.538 | 0.991 |
| Visual memory area | 2 | 107.9 | 4.607 | 0.014 | Normal | ADHD | 3.79 | 1.402 | 0.024 |
| | | | | | | LD | 3.59 | 1.484 | 0.048 |
| | | | | | ADHD | Normal | -3.79 | 1.402 | 0.024 |
| | | | | | | LD | -0.20 | 1.538 | 0.991 |
| | | | | | LD | Normal | -3.59 | 1.484 | 0.048 |
| | | | | | | ADHD | 0.20 | 1.538 | 0.991 |

df: Degree of freedom; MS: Mean square; SE: Standard error; LD: Learning disorder; ADHD: Attention deficit/hyperactivity disorder

## Discussion

The objective in the present study was investigating and comparing some executive functions such as working memory and planning in the three groups of normal children, children with ADHD, and children with LDs. The results showed that children with ADHD and with specific LDs had weaker function in working memory and planning compared to the normal children. The results of this study are consistent with the findings of the one carried out by Chiang and Gau[14] as well as Smith-Spark and Fisk[15] regarding differences between children with ADHD and children with LDs. This point can be also explained by neurology. According to the neurologic viewpoint, the functions of attention and working memory involve common areas in brain.[16] Due to this close

relationship, the difference in working memory performance was not unexpected. Considering the relationship between attention and memory, and taking into account that this memory is known as an effective process in controlling and monitoring learning tasks, the defects of children with ADHD and children with special LDs is justifiable.

The results of the studies by Chiang and Gau[14] and McLean and Hitch[17] are consistent with the findings of the present study about the difference between children with ADHD and children who have LDs with normal children. Regarding the explanation and confirmation of this finding, neurological studies have shown that students with ADHD have deficiency in cerebellum and frontal lobes, which play a significant role in excellent cognitive processes such as planning.[18]

The ability of planning and organizing as one of the most important executive actions and excellent brain activities has attracted the attention of different researchers in terms of its role in daily life activities and in coordinating other actions to achieve the goal. In addition, dyslexic children have poorer planning skills in comparison to their regular counterparts, as these functions play a very important role in academic performance and in the functions concerning daily life assignment and time planning ability. As the inability to organize challenging and new assignments is because of the weakness of these children in planning function. Moreover, children with problem in planning may have a poor verbal and mental process and put wrong spaces between words and letters. Therefore, it seems that planning deficiency is relevant to impulsivity in children with ADHD. Because the defect in planning causes inability to identify, follow up, and organize the steps necessary to solve an issue or assignment. Therefore, these children are incapable of pursuing a goal as programmed steps while doing an assignment. Since the comparison of children with specific LD and normal children was not statistically significant, despite the difference in mean values, it is necessary to consider other studies with bigger sample size and considering more precise research controls in order to achieve correct results. The results of this study can be used to study these children so that they are not deprived of proper education. Furthermore, strategies of executive function training can be included in educational programs designed for these children so that they can substantially improve their education through these interventions. In a general overview, it can be concluded that improving the performance of children with ADHD and children with learning disabilities plays an essential role in their development. Therefore, consideration of this factor in the treatment of these children is necessary.

## Conclusion

In this study, it has been shown that the problems with the exceptional children studied, namely, children with ADHD and children with learning disabilities, are rooted in their executive functions. Based on the findings of this study, executive functions decrease problems among exceptional children and represent new horizons in clinical interventions, and thus could be used as an effective interventional method. Therefore, it seems that intervention on executive functions is an applicable treatment for children with ADHD, and children with learning disabilities.

## Conflict of Interests

Authors have no conflict of interests.

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# Comparison of personality characteristics of social-networks user and non-user girl students in District 1 high schools in Sanandaj City, Iran

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Original Article

## Abstract

BACKGROUND: Adolescence is one of the most active and exciting times in the family life cycle. Access to cyberspace (telegram and instagram) for teenagers and young people is increasing day by day. One of the factors that can play a role in using the internet is personality traits. The purpose of the present study was to compare the personality characteristics of social networks' user and non-user female students of district 1 high schools in Sanandaj City, Iran.

METHODS: The research was of a causal type with a practical purpose. The statistical population of the study consisted of all social networks' user and non-user female students of high schools in district 1 of Sanandaj City in the academic year of 2017-2018. In order to do this research, 123 female high school students who were social networks users and 123 social networks' non-user female high school students were selected randomly by random sampling. The tool used was HEXACO Personality Inventory-Revised (HEXACO-PI-R). The data were analyzed by multivariate analysis of variance (MANOVA) using SPSS software.

RESULTS: There was a significant difference between the two groups in the components of personality traits (honesty-humility, emotionality, extroversion, and openness to experience) ($P < 0.050$).

CONCLUSION: Since prevention is prior to treatment, considering the results of this study, this phenomenon should be considered as an important social issue. And through proper education, the culture of proper use of social network and its facilities replaces the wrong methods.

KEYWORDS: Personality Type, Social Networking, Students

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## Introduction

Adolescence is the transition step from childhood to adulthood.[1] Adolescence on the one hand, is disconnecting your ties with the childhood, and on the other hand, it is fascinated by the achievement of youth independence and adulthood, while in reality it is considered neither completely childhood nor completely adulthood. So, the adolescence period has a wide range that is linked to a part of the realm of childhood and joins the world at the end of the spectrum.[2] In this period, deep and rapid changes occur in the physical, cognitive, and social psychosocial dimensions. Adolescence is a stage of development (biological, psychological, and social) that the person passes through to a stage of life which is expected to establish institutional attributes such as responsibility, self-reliance, etc. in his/her personality and is ready to play social roles (fellowship, fatherhood or motherhood, etc.) and also a special occupational role. As a result of these changes, the person will face a wide range of needs. Mostly, adolescents are associated with peer groups in traditional

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space and before the presence of communication facilities such as chat, mobile phones, and multiple social networks, friendly and emotional relationships and the hobbies of this group of people were limited to the same age groups in spaces such as schools or smaller neighborhood districts.

Undoubtedly, the existence of social networks and the entry of students into this space are affected by the various aspects of communication needs and psychological problems. Especially, the age of maturity has its own particular considerations. As many of the behaviors we take are based on our human personality, adolescents' personality features can be the determining factor in their life style throughout the life.

Virtual social networking is one of the evolutionary forms of virtual communication and the use of modern communication technologies, especially social networks, in recent decades has brought us into a new era and a new community. So that thinkers such as Daniel Bell consider it as a post-industrial community, Manuel Castells as network community, and Tada Umesao as the information society.[3]

In 1974, Rosengren reported that individual differences such as age, gender, and personality affected the use of social media.[4] This hypothesis has been successfully applied to popular media such as cinema, music and television series, as well as books and cultural activities. More research has been conducted about the relationship between Internet and specific personality traits. The five-factor model, or in the other words, the Big Five, is certainly the most used model for this purpose.[5]

What has caused such an issue to be addressed in this opportunity is that social networks have been so influential in the lives of their users in recent years that forms of social communication have also been influenced by these new media. Utilizing these networks by the general public, especially teachers and students, makes them more than a funny tool for finding friends and they have become a tool for achieving long-term political goals and conquering public opinions of a nation and future generations. Researches on the Internet and virtual space all predicate their innumerable benefits in the current century, but these fascinating and unique benefits should not make us ignore their disadvantages.

Therefore, based on the cases, the problem that is raised is that whether there is any difference between the personality characteristics of the social networks' user and non-user students.

## Materials and Methods

The purpose of the present study was to compare the personality characteristics of social networks' user and non-user female students in high schools of district 1 of Sanandaj City, Iran. Performed research was of a causal type with a practical purpose. The statistical population of the study consisted of all female high school students who were users and non-users of social networks in district 1 of Sanandaj City in the academic year of 2017-2018 that the total number of members in the statistical society was estimated at 3600. The sample number was obtained using the Cochran formula as 246 people. In order to do this research, 123 female high school students who were social networks' users and 123 female high school students who were social networks' non-users were selected randomly by random sampling. We used quota sampling given that high school students were in different educational levels and also with regard to the age difference of one to three years.

*Research instruments:* In this study, the HEXACO Personality Inventory-Revised (HEXACO-PI-R) questionnaire was used to collect relevant data about the subject.

**Table 1. The result of Box's M test of the characteristics of social networks' user and non-user students**

| Indicator | Box M | Df | Df1 | Df2 | P |
|---|---|---|---|---|---|
| Amounts | 41.59 | 2.06 | 28.00 | 207457.57 | 0.001 |

Df: Degree of freedom

The Ashton and Lee[6] Personality Questionnaire has 100 questions, and six letters of HEXACO stand for: Honesty-Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to experience (O). This questionnaire was made in 2000 but in 2004 was assessed and prepared in the form of 100 substances. All of the 6 dimensions have 4 sub-dimensions and in total, it consists of 96 questions. The reminded 4 questions paid to friendship and were added to the above cases. Scoring of this questionnaire was done in the form of 5-point Likert scale.

This study was conducted to determine the validity and reliability of this questionnaire. Cronbach's alpha was obtained for honesty-humility (0.92), emotionality (0.90), extroversion (0.92), agreeableness (0.89), conscientiousness (0.89), and openness to experience (0.90).[6]

In the Iranian version of this questionnaire, Cronbach's alpha was obtained for honesty-humility (0.80), emotionality (0.74), extraversion (0.81), agreeableness (0.73), conscientiousness (0.73), and openness to experience (0.76).[7]

In another study in Iran, the validity and reliability of this questionnaire was evaluated as desirable. In this validation study, factor analysis was performed and all the factors found in the original version were confirmed in the Iranian version.[8]

Data were analyzed using descriptive and inferential statistics; in the descriptive statistics section, the mean and standard deviation (SD) and for analyzing the data obtained in the main hypotheses inferential statistics were used. Multivariate analysis of variance (MANOVA) and Mann-Whitney U test were also used via SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

## Results

This study was performed on 246 female high school students in district 1 of Sanandaj City. Of these subjects, 30 people (12.1%) were studying in the humanities, 40 people (16.2%) in experimental sciences, 20 people (8.1%) in mathematics and physics, and 50 people (20.3%) in the vocational school; also 6 people (2.4%) were in the pre-university and 100 people (40.6%) were in the first grade of high school.

Percentages assigned to duration of social networks' use up to 3.5 hours a day and more than 3.5 hours a day were 60.5% and 39.4%, respectively.

In the table 1, the result of Box's M test characteristics of social networks' user and non-user students is shown. Considering the significance level of the test (P = 0.001) and the degree of freedom (df = 2.06) (df 2 = 207457.57), the homogeneity of the dispersion assumption was rejected.

In table 2, based on the Wilcoxon tests lambda, which is equal to 0.31 and with a meaningful significance of < 0.001, and degree of freedom of 75.24, the assumption of the averaging of the components of the personality traits of social networks' user and non-user students was rejected.

**Table 2. The result of the Wilcoxon test of the personality traits of the social networks' user and non-user students**

| Test | λ | Df | Hypothesis df | Error df | P | $\eta^2$ |
|---|---|---|---|---|---|---|
| Wilks` lambda | 0.310 | 75.24 | 7.00 | 238.00 | < 0.001 | 0.698 |

Df: Degree of freedom

In other words, the six averages had a significant difference with respect to the social networks' user and non-user students.

Table 3 showed that the components of honesty-humility, emotionality, extroversion, and openness to experience were significant ($P < 0.050$) and these components had significant differences in the two groups of students.

**Table 3. The result of the analysis of variance (ANOVA) of dependent variables in the levels of components of HEXACO's personality traits in social networks' user and non-user students**

| Variables | Df | Df1 | Df2 | P |
|---|---|---|---|---|
| Honesty-Humility | 15.38 | 1 | 244 | 0.001 |
| Emotionality | 29.83 | 1 | 244 | 0.001 |
| Extroversion | 2.98 | 1 | 244 | 0.005 |
| Agreeableness | 0.51 | 1 | 244 | 0.480 |
| Conscientiousness | 0.05 | 1 | 244 | 0.820 |
| Openness to experience | 7.40 | 1 | 244 | 0.005 |

Df: Degree of freedom

What emerges from the results of this study is that among the six components of HEXACO's personality traits including the components of honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience, there were no significant differences between two groups in two components of agreeableness and conscientiousness. And only in the components of honesty-humility, emotionality, extroversion, and openness to experience a significant difference was observed between two groups of social networks' user and non-user students.

## Discussion

One of the variables that attracted the attention of researchers and a large volume of studies has been conducted on it, is personality traits.[9,10] There are researches in confirming the relationship between personality traits and the use of Internet spaces.[11,12]

In their research, Muscanell and Guadagno have shown that the amount of chat, online friendship, secret chat, and the rate of downloading sexually-explicit photos and videos with personality characteristics of extroversion have a positive relationship with the amount of Internet use.[13]

Researchers have done extensive research in this area in order to examine the relationship between personality interface and personality traits with the behavior in virtual social networks. In this regard, Ryan and Xenos used a Facebook-based study to examine the relationship between personality traits, narcissism, and loneliness, with the use of Facebook. The results showed that extroversion and narcissism were positively correlated with Facebook usage, and in contrast to it, conscientiousness, shyness, and loneliness had a negative relationship. They believed that extra personality traits such as the desire to establish social relationships and the existence of a widespread social network could justify greater use of people with high levels of extroversion from virtual social networks.[5]

On the other hand, Ross et al. explored the relationship between personality traits and Facebook usage. The results indicated that there was a significant but weak relationship between personality characteristics and using Facebook social network.[14] However, the results of the research by Amichai-Hamburger and Vinitzky[15] on the relationship between using social networks and personality traits, in contrast to the study of Ross et al.[14] showed a significant and strong relationship between personality traits and the use of social networks.

The findings of the present study in the dimension of extraversion are consistent with the results of some studies including Wilson et al.,[8], Jenkins-Guarnieri et al.,[16] Ryan and Xenos,[5] and Mark and Ganzach.[17]

But our findings are inconsistent with the results of studies such as Nithya and Julius,[18] Khanjani and Akbari,[19] and Young and Rodgers,[20] who have been studying the relationship between personality traits and using the Internet. In the dimension of introversion-extraversion, there are the opposite of the results of the present study; this means

that the findings of the research indicate that individuals with high levels of introversion make up the majority of Internet users.

On the other hand, the findings of this research in the area of openness to experience are consistent with the research of Wang et al.,[21] Ross et al.,[14] and Correa et al.[10] People with a high level of openness to experience are curious about the inner and outer world and their lives are full of experience and appear to be conservative in the face of people with low levels in this factor.

Landers and Bury's[12] quotation by Shayegh et al.[22] has shown that people have a pleasant, conscientious, and outspoken way of using the Internet.

In the present study, the personality dimension of agreeableness means that more adaptable students are less likely to go into Internet addiction. The more consistent individuals have some distinctive features that are: altruism and helping others, humility, simplicity, trust, preparedness to defend individual rights, facing positive social aspects, and more mental health. The results are consistent with those of Anita and Liliana.[23]

Regarding the results, the personality dimension of conscientiousness cannot significantly predict the amount of Internet usage due to insignificance. This finding does not match the research carried out by Shayegh et al.,[22] as their finding suggests that there is a relationship between conscientiousness and the use of Internet. Conscientiousness includes impulse control, according to prescriptions from the community, which facilitates behaviors aimed at the individual's goals and duties. This dimension emphasizes determination and reliability and includes features such as precision, accountability and planning, hard work, and orientation towards progress and perseverance.[24] There is a negative correlation between conscientiousness and the use of Internet. The findings are consistent with those of Anita and Liliana.[23]

Some personality traits may predict Internet usage. For example, people who have a high degree of openness can be said to be curious and inclined to adventure which may be appealing to them as an opportunity for a fresh search.[12]

## Conclusion

Considering that other factors such as cultural, economic, and other factors are related to personality traits, we can not only consider media such as social networks, but what seems to be necessary is to pay more attention to the impact of the quality of virtual networks on the mood of different people.

Clearly, the high use of virtual social networks and the Internet will bring its own mental and physical crises, which, if not timely detected and addressed, can face the community's mental health with new challenges and perhaps now that we are still at the forefront of using virtual social networks, we need to be more responsible with these new possibilities; therefore, we should carefully evaluate all aspects and implications of using these social networks and transfer the research results to counselors and educators, school officials and teachers, and the mass media in order to provide a true understanding of the new phenomena of the today's world.

Parents are also required to familiarize their children with physical, moral, and behavioral hazards, and also with inappropriate, unnecessary, and useless uses of new technologies such as satellite, Internet, virtual social networks, and mobile phones. Enhancing self-awareness and self-control in adolescents is essential for the optimal use of new technologies.

Since prevention is prior to treatment, according to the results of this study, this phenomenon should be considered as an important social issue and through proper education the culture of proper usage of social networks and their facilities should be replaced by wrong methods. Therefore, timely planning can help reduce the complications that result from the improper use of this technology.

## Conflict of Interests

Authors have no conflict of interests.

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# Nurses' understanding of evidence-based practice: Identification of barriers to utilization of research in teaching hospitals

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Original Article

## Abstract

BACKGROUND: In medical organizations, utilizing evidence-based practice (EBP) helps nurses and patients make the best decision in health care in certain clinical settings. Hence, recognizing its educational barriers is so important.

METHODS: The present study was a descriptive-analytical research that was conducted using a cross-sectional design in 6 teaching hospitals of Qazvin City, Iran, in 2014. The study sample consisted of 260 nurses. Based on the number of the nurses working in each hospital, the study sample was chosen by a stratified random method. Two questionnaires were employed to collect the required data. The first questionnaire was Evidence-Based Practice Questionnaire (EBPQ) that evaluates nurses' understanding of EBP. The second questionnaire was related to measuring the barriers to utilization of research by the nurses that was developed by Funk et al. For analyzing the collected data, frequency distribution tables, analysis of variance (ANOVA), and linear regression coefficient were used.

RESULTS: The total mean of EBP among the nurses was at a level above average. The subscales of knowledge/skill (3.74) and attitude (3.87) had a lower average compared to the subscale of practice (4.14). The total mean of the barriers was 3.07. According to the results of the present study, organization and adopter had the highest and lowest means, respectively.

CONCLUSION: Identifying the barriers that affect effective EBP implementation can help nurses achieve their goals by removing these obstacles, building the necessary infrastructure, and providing human, physical, and financial resources.

KEYWORDS: Evidence-Based Practice, Knowledge, Attitude, Nursing, Teaching Hospitals, Iran

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## Introduction

Care is considered as an essential component in health care services. Among all types of care that are delivered in medical environments (such as hospitals), nursing care has a particular significance.[1] That is why provision of care and services with appropriate quality is proposed as a priority in the health care system especially in the field of nursing services.[2] In this regard, nurses are expected to deliver care services with maximum quality and quantity standards and based on scientific findings. In addition, by examining and reviewing care procedures, they should acquire necessary ability to make clinical decisions while delivering care services.[3]

Evidence-based practice (EBP) is a problem-

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solving approach in providing health care services, in which the best evidence of relevant studies and the data obtained from taking care of patients is combined with the health care providers' experiences and the patients' preferences and values. In these conditions, the highest quality care and outcomes can be obtained.[4] In medical organization, nurses use evidence- and research-based practice in order to evaluate their skills, develop and implement policies and procedures, carry out effective clinical interventions, and prepare care plans so as to enhance positive outcomes for patients.[5] International Council of Nurses (ICN) has committed nurses to actively participate in research in the field of nursing and use the findings in order to develop EBP.[6] It is stated that EBP has different advantages such as improving the care quality and its outcomes, positive results of clinical practice, positive outcomes for the patients, standardization of care, and an increase in nurse satisfaction.[7] Implementing EBP, however, is challenging.[8] Various studies have indicated that in general, the nurses' understanding of EBP is positive and they believe that it is important to pay attention to it in order to deliver care services with higher quality; however, its implementation is slow.[9] Unfortunately, a small percentage of nurses work within EBP framework.[10] Research has indicated that there are some barriers to implementing EBP among clinical nurses.[11]

A study in Iran showed that major barriers to employing research include lack of time to study articles, insufficient facilities for conducting research, and lack of sufficient authority to change nursing procedures.[12] In a study carried out on 760 clinical nurses throughout the United States (US), Pravikoff et al. found out that nurses sought necessary information more from their colleagues than articles published in journals. In that study, more than half of the nurses stated that they had not used research reports in their clinical decisions and 82% of them had never used the hospital's library.[13] In another study that was carried out in the US, EBP among nurses was 4.49, 5.15, and 4.56 out of 7 for practice, attitude, and knowledge/skill, respectively.[14] In a study that was carried out by Koehn and Lehman, the participants obtained an average score on practice and attitude of EBP. The mean scores of knowledge/skill were to some extent lower. Two barriers were mentioned to be involved in implementing EBP: time and knowledge.[15] Based on what was said, considering the importance of EBP in nursing practice and its effect on the quality and efficiency of patient care, and seeing that no study has been done in this field in teaching hospitals of Qazvin City, Iran, the research team decided to do this research. Therefore, the present study was aimed at investigating the level of understanding EBP, including the level of knowledge/skill, attitude, and the level of using EBP among the nurses working in Qazvin's teaching hospitals, and identifying the barriers to using research in nurses' usual functions.

## Materials and Methods

The present study was a descriptive-analytical research that was carried out using a cross-sectional design in 6 teaching hospitals of Qazvin City in 2014. The study sample consisted of 260 nurses. Based on the number of the nurses working in each hospital, the study sample was chosen by a stratified random method. Two questionnaires were employed to collect the required data. The first questionnaire was Evidence-Based Practice Questionnaire (EBPQ) developed by Upton and Upton[11] which measures the nurses' understanding of EBP. This instrument has 3 subscales: knowledge/skill, attitude, and utilization extent. It has 24 items that are scored using a 7-point Likert scale.

The second questionnaire was related to measuring the barriers to utilization of research by the nurses, that was developed by Funk et al.[16] This scale consists of 29 items and 4

subscales including adopter, organization, innovation, and communication. It is scored based on a 5-point Likert scale: 1 for "to no extent", 4 for "to a great extent", and an option for "no opinion".

## Results

A total of 260 nurses from 6 hospitals affiliated with Qazvin University of Medical Sciences participated in the present study. The studied hospitals included: Shahid Rajaie, Kousar, Avicenna, Qods, Velayat, and 22 Bahman. Their mean age was 31.9 years and most of the participants (45.7%) belonged to the age group of 30-39 years. The individuals' mean work experience was 8.17 years, with the maximum work experience belonging to 1-4 years (33.8%). Table 1 indicates the participants' frequency in regard to their responses to EBPQ.

According to the results presented in table 1, the average total EBP among the nurses was 3.91 out of 7. Here, the subscales of practice and attitude had a higher average than knowledge/skill subscale. Among the items of practice dimension, the highest mean was related to "Evaluating the outcome of the practice" with 4.51 and the lowest to "Critically appraising the evidence" with 3.52.

According to the results presented in table 2, organizational dimension or factors related to the medical center had the highest mean, and adopter dimension or factors related to the individuals (nurses) obtained the lowest means. Moreover, the total mean of the barriers was 3.07. Among the items of the adopter dimension, the maximum mean was related to the item "The nurse sees little benefit for self" and the minimum to the item "The nurse is unwilling to change/try new ideas". Among the items of organization dimension, the highest mean was related to the item "There is insufficient time on the job to implement new ideas" and the lowest to the item "The nurse does not have time to read research".

Table 3 shows the relationship between knowledge, attitude, and practice with the dimensions of the perceived barriers to EBP. The results of the regression test between the dependent variable of knowledge/skill and independent variables of the dimensions of EBP barriers indicated that the variable of adopter's characteristics had a decreasing effect on knowledge/skill, such that with an increase of 1 unit in standard deviation (SD) of the adopter's characteristics, a decrease of 0.22 unit would occur in the variable of knowledge/skill. Moreover, organization and communication had an increasing effect on knowledge/skill in a way that an increase of 1 unit in the SD of organization and communication would lead to 0.206 unit and 0.192 unit of increase in knowledge/skill variable, respectively. The effect of innovation on knowledge/skill was not significant at a level of 0.050 ($P = 0.485$). Moreover, the results of regression test showed that there was no significant relationship between attitude and the dimensions of the perceived barriers to EBP ($P > 0.050$). Considering the results of linear regression test between the variable of practice and the dimensions of the perceived barriers to EBP, it can be concluded that adopter had a reducing effect on practice, such that by increasing of 1 unit in SD of adopter , the practice score increases to 0.166 unit. In addition, communication had an increasing effect on practice in a way that an increase of 1 unit in SD of communication would lead to an increase of 0.182 unit in practice. The effect of organization and innovation on practice was not significant at a level of 0.050 ($P > 0.050$).

## Discussion

In the present study, the total mean of EBP among the nurses was at a level above average. The subscales of knowledge/skill (3.74) and attitude (3.87) had a lower average compared to the subscale of practice (4.14).

**Table 1. The frequency of nurses' responses to the evidence-based practice questionnaire (EBPQ)**

| Practice | Mean (4.14) | | Never 1 | 2 | 3 | 4 | 5 | 6 | Frequently 7 |
|---|---|---|---|---|---|---|---|---|---|
| Formulating a clearly answerable question | (4.02) | n (%) | 21 (8.1) | 34 (13.1) | 55 (21.2) | 49 (18.8) | 36 (13.8) | 40 (15.4) | 25 (9.6) |
| Tracking down the relevant evidence | (3.90) | n (%) | 14 (5.4) | 41 (15.8) | 55 (21.2) | 53 (20.4) | 57 (21.9) | 25 (9.6) | 15 (5.8) |
| Critically appraising | (3.52) | n (%) | 19 (7.3) | 57 (21.9) | 60 (23.1) | 63 (24.2) | 29 (11.2) | 18 (6.9) | 14 (5.4) |
| Integrating the evidence | (4.37) | n (%) | 6 (2.3) | 24 (9.2) | 51 (19.6) | 61 (23.5) | 50 (19.2) | 42 (16.2) | 26 (10.0) |
| Evaluating the outcomes of practice | (4.51) | n (%) | 6 (2.3) | 20 (7.7) | 45 (17.3) | 64 (24.6) | 47 (18.1) | 43 (16.5) | 34 (13.1) |
| Sharing the information with colleagues | (4.49) | n (%) | 5 (1.9) | 28 (10.8) | 40 (15.4) | 63 (24.2) | 41 (15.8) | 51 (19.6) | 32 (12.3) |
| **Attitude** | **Mean (3.87)** | | **Negative 1** | **2** | **3** | **4** | **5** | **6** | **Positive 7** |
| Making the time to keep update new evidence instead of insufficient time due to workload | (3.04) | n (%) | 82 (31.5) | 46 (17.7) | 32 (12.3) | 45 (17.3) | 16 (6.2) | 13 (5.0) | 26 (10.0) |
| Resenting when your clinical practice questioned instead of welcoming them | (3.86) | n (%) | 50 (19.2) | 37 (14.2) | 37 (14.2) | 34 (13.1) | 29 (11.2) | 24 (9.2) | 49 (18.8) |
| Being EBP a waste of time instead of fundamental to professional practice | (4.72) | n (%) | 23 (8.8) | 26 (10.0) | 30 (11.5) | 34 (13.1) | 34 (13.1) | 36 (13.8) | 77 (29.6) |
| Sticking to old ways versus changing your practice | (3.86) | n (%) | 42 (16.2) | 40 (15.4) | 46 (17.7) | 32 (12.3) | 32 (12.3) | 23 (8.8) | 45 (17.3) |
| **Knowledge/skills** | **Mean (3.74)** | | **Poor 1** | **2** | **3** | **4** | **5** | **6** | **Best 7** |
| Research skills | (3.08) | n (%) | 56 (21.5) | 52 (20.0) | 46 (17.7) | 54 (20.8) | 35 (13.5) | 7 (2.7) | 10 (3.8) |
| IT skills | (3.50) | n (%) | 25 (9.6) | 49 (18.8) | 62 (23.8) | 59 (22.7) | 34 (13.1) | 22 (8.5) | 9 (3.5) |
| Monitoring and reviewing of practice skills | (3.90) | n (%) | 19 (7.3) | 33 (12.7) | 45 (17.3) | 72 (27.7) | 54 (20.8) | 24 (9.2) | 13 (5.0) |
| Converting your information needs into a research question | (3.15) | n (%) | 42 (16.2) | 46 (17.7) | 72 (27.7) | 53 (20.4) | 30 (11.5) | 13 (5.0) | 4 (1.5) |
| Awareness of major information types and sources | (3.62) | n (%) | 24 (9.2) | 38 (14.6) | 61 (23.5) | 65 (25.0) | 45 (17.3) | 16 (6.2) | 11 (4.2) |
| Ability to identify gaps in your professional practice | (3.95) | n (%) | 18 (6.9) | 28 (10.8) | 51 (19.6) | 74 (28.5) | 43 (16.5) | 34 (13.1) | 12 (4.6) |
| Knowledge of how to retrieve evidence | (3.50) | n (%) | 29 (11.2) | 38 (14.6) | 66 (25.4) | 59 (22.7) | 41 (15.8) | 22 (8.5) | 5 (1.9) |
| Ability to analyze critically evidence against set standards | (3.57) | n (%) | 19 (7.3) | 49 (18.8) | 54 (20.8) | 71 (27.3) | 41 (15.8) | 21 (8.1) | 5 (1.9) |
| Ability to determine how valid (close to the truth) the material is | (3.78) | n (%) | 20 (7.7) | 36 (13.8) | 49 (18.8) | 70 (26.9) | 52 (20.0) | 23 (8.8) | 10 (3.9) |
| Ability to determine how useful (clinically applicable) the material is | (3.87) | n (%) | 20 (7.7) | 27 (10.4) | 61 (23.5) | 65 (25.0) | 46 (17.7) | 28 (10.8) | 13 (5.0) |
| Ability to apply information to individual cases | (3.99) | n (%) | 18 (6.9) | 30 (11.5) | 50 (19.2) | 58 (22.3) | 61 (23.5) | 28 (10.8) | 15 (5.8) |
| Sharing of ideas and information with colleagues | (4.25) | n (%) | 21 (8.1) | 16 (6.2) | 49 (18.8) | 52 (20.0) | 56 (21.5) | 44 (16.9) | 22 (8.5) |
| Dissemination of new ideas about care to colleagues | (4.06) | n (%) | 29 (11.2) | 25 (9.6) | 46 (17.7) | 48 (18.5) | 49 (18.8) | 40 (15.4) | 23 (8.8) |
| Ability to review your own practice | (4.19) | n (%) | 21 (8.1) | 18 (6.9) | 47 (18.1) | 61 (23.5) | 50 (19.2) | 44 (16.9) | 19 (7.3) |

EBP: Evidence-based practice; IT: Information technology

**Table 2. The frequency of the barriers to utilization of evidence-based practice (EBP) among studied nurses**

| Adopter | Mean (2.90) | | To no extent | To a little extent | To a moderate extent | To a great extent | No opinion |
|---|---|---|---|---|---|---|---|
| The nurse is unaware of the research | | | | | | | 8 (3.1) |
| The nurse feels the benefits of changing practice will be minimal | (3.12) | n (%) | 21 (8.1) | 49 (18.8) | 78 (30.0) | 102 (39.2) | 10 (3.8) |
| The nurse is isolated from knowledgeable colleagues with whom to discuss the research | (3.08) | n (%) | 20 (7.7) | 50 (19.2) | 90 (34.6) | 90 (34.6) | 10 (3.8) |
| The nurse sees little benefit for self | (3.15) | n (%) | 16 (6.2) | 45 (17.3) | 95 (36.5) | 90 (34.6) | 14 (5.4) |
| The nurse does not see the value of research for practice | (2.70) | n (%) | 49 (18.8) | 72 (27.7) | 67 (25.8) | 51 (19.6) | 21 (8.1) |
| There is not a documented need to change practice | (2.89) | n (%) | 23 (8.8) | 78 (30.0) | 85 (32.7) | 53 (20.4) | 21 (8.1) |
| The nurse is unwilling to change/try new ideas | (2.56) | n (%) | 58 (22.3) | 73 (28.1) | 72 (27.7) | 40 (15.4) | 17 (6.5) |
| The nurse does not feel capable of evaluating the quality of the research | (2.83) | n (%) | 41 (15.8) | 66 (25.4) | 77 (29.6) | 50 (19.2) | 26 (10.0) |
| **Organization** | **Mean (3.28)** | | **To no extent** | **To a little extent** | **To a moderate extent** | **To a great extent** | **No opinion** |
| The facilities are inadequate for implementation | (3.32) | n (%) | 20 (7.7) | 36 (13.8) | 52 (20.0) | 146 (56.2) | 6 (2.3) |
| The nurse does not have time to read research | (3.23) | n (%) | 25 (9.6) | 35 (13.5) | 63 (24.2) | 130 (50.0) | 7 (2.7) |
| The nurse does not feel she/he has enough authority to change patient care procedures | (3.27) | n (%) | 14 (5.4) | 45 (17.3) | 66 (25.4) | 128 (49.2) | 7 (2.7) |
| The nurse feels results are not generalizable to own setting | (3.25) | n (%) | 15 (5.8) | 40 (15.4) | 78 (30.0) | 118 (45.4) | 9 (3.5) |
| Physicians will not cooperate with implementation | (3.34) | n (%) | 17 (6.5) | 38 (14.6) | 70 (26.9) | 110 (42.3) | 25 (9.6) |
| Administration will not allow implementation | (3.26) | n (%) | 15 (5.8) | 53 (20.4) | 70 (26.9) | 93 (35.8) | 29 (11.2) |
| Other staff are not supportive of implementation | (3.27) | n (%) | 13 (5.0) | 47 (18.1) | 74 (28.5) | 110 (42.3) | 16 (6.2) |
| There is insufficient time on the job to implement new ideas | (3.37) | n (%) | 13 (5.0) | 25 (9.6) | 85 (32.7) | 128 (49.2) | 9 (3.5) |
| **Innovation** | **Mean (3.14)** | | **To no extent** | **To a little extent** | **To a moderate extent** | **To a great extent** | **No opinion** |
| The research has not been replicated | (3.13) | n (%) | 21 (8.1) | 66 (25.4) | 77 (29.6) | 50 (19.2) | 46 (17.7) |
| The nurse is uncertain whether to believe the results of the research | (3.00) | n (%) | 23 (8.8) | 60 (23.1) | 91 (35.0) | 67 (25.8) | 19 (7.3) |
| The research has methodological inadequacies | (3.18) | n (%) | 12 (4.6) | 69 (26.5) | 80 (30.8) | 58 (22.3) | 41 (15.8) |
| Research reports/articles are not published fast enough | (3.23) | n (%) | 21 (8.1) | 41 (15.8) | 71 (27.3) | 110 (42.3) | 17 (6.5) |
| The conclusions drawn from the research are not justified | (3.18) | n (%) | 14 (5.4) | 62 (23.8) | 96 (36.9) | 38 (14.6) | 50 (19.2) |
| **Communication** | **Mean (2.95)** | | **To no extent** | **To a little extent** | **To a moderate extent** | **To a great extent** | **No opinion** |
| Research reports/articles are not readily available | (2.92) | n (%) | 24 (9.2) | 69 (26.5) | 79 (30.4) | 79 (30.4) | 9 (3.5) |
| Implications for practice are not made clear | (3.03) | n (%) | 19 (7.3) | 60 (23.1) | 86 (33.1) | 85 (32.7) | 10 (3.8) |
| Statistical analyses are not understandable | (2.72) | n (%) | 36 (13.8) | 79 (30.4) | 73 (28.1) | 65 (25.0) | 7 (2.7) |
| The research is not relevant to the nurse's practice | (2.77) | n (%) | 29 (11.2) | 76 (29.2) | 87 (33.5) | 62 (23.8) | 6 (2.3) |
| The relevant literature is not compiled in one place | (3.23) | n (%) | 11 (4.2) | 54 (20.8) | 92 (35.4) | 70 (26.9) | 33 (12.7) |
| The research is not reported clearly and readably | (3.03) | n (%) | 18 (6.9) | 64 (24.6) | 89 (34.2) | 71 (27.3) | 18 (6.9) |

The results of the present study are in agreement with those of the studies carried out by Shafiei et al.[17]and Upton and Upton.[18] They are also in line with the findings of the study carried out by Koehn and Lehman who reported that the participants obtained an average score on practice of and attitude toward EBP.[15] In a study, Thiel and Ghosh reported that the level of knowledge and attitude among the participants was positive and average.[19] It was suggested that implementing educational plans on EBP fundamentals and philosophy would be useful in enhancing the level of knowledge, attitude, and practice among the nurses and improving nursing practice.

Among the items of practice dimension, the maximum mean was related to "Evaluating the outcomes of practice" with 4.51 and the minimum to "Critically appraising the evidence" with 3.52. In the studies carried out by Brown et al.[14] and Shafiei et al.,[17] "Critically appraising the evidence" placed in the first priority.

Among the items of attitude dimension, the highest mean was related to "Being EBP a waste of time instead of fundamental to professional practice" with 4.72 and the lowest to "Making the time to keep update new evidence instead of insufficient time due to workload" with 3.04. This finding is not in line with that of the study carried out by Shafiei et al.[17] who reported that the highest priority belonged to "Sticking to old ways instead of changing the practice".

Among the items of knowledge/skill dimension, the maximum mean was related to "Sharing ideas and information with colleagues" with 4.25 and the minimum to "Research skills" with 3.08. This finding is in line with those reported by Shafiei et al.[17] In Brown et al.'s study, this item placed in the second rank.[14]

According to the results of the present study, organization and adopter had the highest and lowest means, respectively. In Brown et al.'s study, the mean of the whole barriers was lower than that of the present study, and organization and innovation dimensions were the lowest.[20] In the study carried out by McCleary and Brown, communication obtained the maximum mean and adopter placed at the end.[21] Researchers have suggested that better understanding of workplace is necessary in understanding and improving the interventions so as to promote EBP in nursing.[22,23]

**Table 3. The relationship between knowledge/skill, attitude, and practice with the dimensions of the perceived barriers to evidence-based practice (EBP)**

| Response variable | Independent variable | R2 | F | P | B | SE | B | T | P |
|---|---|---|---|---|---|---|---|---|---|
| Performance | Adopter | | | | -4.316 | 1.965 | -0.166 | -2.196 | 0.029 |
| | Organization | | | | 2.889 | 2.259 | 0.111 | 1.279 | 0.202 |
| | Innovation | | | | -1.328 | 2.225 | -0.053 | -0.597 | 0.551 |
| | Communication | | | | 4.851 | 2.421 | 0.182 | 2.004 | 0.046 |
| | (Constant) | | | | 45.095 | 5.834 | -- | 7.730 | < 0.001 |
| Attitude | Adopter | | | | -1.390 | 0.700 | -0.150 | -1.980 | 0.050 |
| | Organization | | | | 0.760 | 0.810 | 0.080 | 0.930 | 0.350 |
| | Innovation | | | | -0.590 | 0.800 | -0.070 | -0.740 | 0.460 |
| | Communication | | | | 1.060 | 0.870 | 0.110 | 1.220 | 0.220 |
| | (Constant) | | | | 15.630 | 2.100 | -- | 7.460 | < 0.001 |
| Knowledge/skill | Adopter | | | | -2.558 | 0.860 | -0.220 | -2.974 | 0.003 |
| | Organization | | | | 2.401 | 0.994 | 0.206 | 2.415 | 0.016 |
| | Innovation | | | | -0.684 | 0.979 | -0.061 | -0.699 | 0.485 |
| | Communication | | | | 2.299 | 1.065 | 0.192 | 2.158 | 0.032 |
| | (Constant) | | | | 19.624 | 2.563 | -- | 7.658 | < 0.001 |

SE: Standard error

In organization dimension, the top priority was related to the barriers. In Brown et al.'s study, organization was also considered as a barrier that was compatible with EBP, followed by communication, adopter, and innovation, respectively.[20] In other published studies, this barrier has also been reported as a similar response pattern.[21,24-26] In their study, Solomons and Spross concluded that the commonest barrier to EBP among nurses was related to the lack of time and authority for change.[27] In a study carried out by Majid et al., it was concluded that EBP training, availability of sufficient time, and supervision by an experienced nurse could play an effective role in implementing EBP. Shortage of time, inability to understand statistical concepts, and insufficient understanding of terminology were three major barriers to implementing EBP.[9] Nurses need time when they are free from their bedside responsibilities and can evaluate evidence and promote the educational foundations. It is necessary to devote some hours other than taking care of patients to participating in educational plans that are scheduled in the workplace.

Furthermore, according to the nurses, among organizational barriers, lack of cooperation by doctors (3.34) had the highest priority. In studies carried out by Mehrdad et al.,[12] Funk et al.,[16] and Retsas,[28] this dimension was reported to have significance. In Brown et al.'s study carried out in the US, however, this dimension had the 7th priority.[14]

According to the results of the present study, practice had a negative (decreasing) relationship with adopter barrier and a positive (increasing) relationship with communication. There was a negative (decreasing) relationship between knowledge/skill and adopter barrier, and there was a positive (increasing) relationship between organizational barriers and communication. There was no significant relationship between attitude and the perceived barriers to EBP. The results of the present study are not in agreement with those of the study carried out by Brown et al.[20] who concluded that there was a negative significant relationship between practice and communication. Attitude had a negative significant relationship with all four barriers, and there was a negative significant relationship between communication and adopter, communication, and organization.

## Conclusion

In general, the results of the current study indicated that the nurses' capacity for EBP was at a level higher than average. However, it is better to design appropriate educational plans by employing the findings of the present study and focusing on the improvable aspects in order to increase the nurses' awareness of the concepts and access to the best educational evidence. These educational plans can also be taken into account in the curriculum of nursing trainings, so that after their graduation, they can use their skills properly to enhance their practice. Moreover, through evaluation of learning needs, educational plans persuade the managers of the organizations to support such plans. Since barriers influence the implementation of EBP, identifying these barriers and adopting strategies to remove them can facilitate EBP implementation and improve the efficiency of the plans. In this regard, suggestion of establishing organizational infrastructures and the required human, physical, and financial resources can be helpful. One of the limitations of the current study is that the findings have been collected and analyzed in training hospitals of Qazvin University of Medical Sciences; therefore, they cannot be generalized for non-training, private, and other hospitals.

## Conflict of Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this paper.

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# Overexpression of epithelial cell adhesion molecule (EpCAM) in gastric cancer and its correlation with overall survival of the patients

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Original Article

## Abstract

BACKGROUND: Epithelial cell adhesion molecule (EpCAM) is an adhesion molecule which is expressed on the epithelial cells and primarily identified as a tumor marker for carcinoma. In this study, the expression of EpCAM in precancerous and cancerous gastric lesions was investigated and then, the association of EpCAM expression with the overall survival of patient suffering from gastric carcinoma was evaluated.

METHODS: 12 gastric carcinoma, 3 dysplasia, and 8 intestinal metaplasia (IM) subjects were taken from the department of pathology of Tohid Hospital, Sanandaj, Iran. The diagnosis was made by the expert pathologist. Then, the subjects were stained for EpCAM by immunohistochemistry (IHC) and analyzed by the pathologist.

RESULTS: The data showed that EpCAM was expressed in all of the precancerous and cancerous samples. However, 76.4% of carcinoma cells were positive for EpCAM while it was 62.5% and 51.3% for dysplasia and IM, respectively. Importantly, it was observed that the expression of EpCAM on gastric cancer was negatively correlated with the overall survival of the patients.

CONCLUSION: In conclusion, it was demonstrated in this study that EpCAM is expressed in gastric carcinoma and its expression is negatively correlated with the overall survival of the patients with gastric cancer.

KEYWORDS: Epithelial Cell Adhesion Molecule, Gastric Cancer, Tumors

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## Introduction

Gastric cancer is the second most common cause of cancer mortality worldwide[1] and its incidence increases after the age of 40 years old. The ethnic origin can be a possible risk factor for gastric cancer, as its overall survival and incidence rates vary in different geographic locations, with high incidence in East, South, and Central Asia, Central and Eastern Europe, and South America, whereas the United States has the lowest incidence rate.[2,3] Gastroesophageal reflux disease (GERD) and obesity are the main risk factors for the development of proximal tumors, while the major risk factor for distal cancers is dietary factors and Helicobacter pylori (H. pylori) infection.[4] In spite of remarkable progress in the therapeutic methods and surgical techniques, the outcome of patients with gastric cancer is not satisfactory.[5] Therefore, multimodal therapy may be a good option for these patients, albeit the lack of effective markers.

The epithelial cell adhesion molecule (EpCAM, CD326) is a 39-42 KDa, 314-amino acid, type I transmembrane glycoprotein

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encoded by the 9-exon gene TACSTD1. This glycoprotein comprises a large extracellular domain with an epidermal growth factor (EGF)-like domain and a putative thyroglobulin (TY) domain, a single transmembrane region, and a short (26 amino acids) cytoplasmic tail. EpCAM belongs to the family of adhesion molecules, but cell adhesion is not its single role and has many other functions including cellular signaling, proliferation, cell migration, and differentiation.[1, 5-7] EpCAM is overexpressed in various epithelial cancers and its expression has been shown in numerous epithelial tissues.[8] EpCAM overexpression has been revealed in gastric cancers, while it is not overexpressed in healthy gastric tissues.[9] In the majority of cancers, EpCAM expression has not a good prognosis, however gastric cancer is accompanied by some contradictions.[10] In this introductory study, EpCAM expression on gastric precancerous and cancerous lesions were examined.

## Materials and Methods

Paraffin-embedded tissue samples of 23 cases [12 gastric cancers, 3 dysplasia, and 8 intestinal metaplasia (IM)] were taken out from the archives of the pathology department of Tohid Hospital, Sanandaj, Iran. All samples were confirmed and staged in the pathology department, according to Gleason scores. Clinical information was obtained from the medical records.[10]

***Immunohistochemistry (IHC):*** The blocks were cut in 5 µm and after heating at 60 °C for 1 hour, they were deparaffinized in xylene. Then, the blocks were rehydrated in increasing grads of ethanol. For antigen retrieval, the sample was incubated for 20 minutes at 95 °C in citrate buffer and incubated with 0.3% hydrogen peroxide for 10 minutes at room temperature to block endogenous peroxidase activity. After protein blocking with bovine serum albumin (BSA) 1% for 5 minutes at room temperature, the samples were incubated with 1:100 diluted EpCAM primary antibody (eBioscience™), at 4 °C for 24 hours. IHC staining was performed with a kit (Dako, Denmark), according to the manufacturer protocol, and hematoxylin was used for counterstaining. After mounting, slides were examined by a pathologist. Only membranous staining was considered for IHC scoring. For each tumor sample, staining intensity (0, 1+, 2+, and 3+) and percentage of positive tumor cells were estimated. Results were grouped as follows: negative (total absence of staining), weak (1+ staining in < 60% of cells or 2+ staining in < 30% of cells), moderate (1+ staining in ≥ 60% of cells, 2+ staining in 30% to 70%, or 3+ staining in < 30%), and strong (2+ staining in > 70% or 3+ staining in ≥ 30%).[11]

One way analysis of variance (ANOVA) with Tukey's post-test were used to analyze the statistical differences of EpCAM expression of IM, gastrointestinal dysplasia (GID), and carcinoma. The Kaplan-Meier method was exploited for survival curves, and P values were calculated using the log-rank (Mantel-Cox) test. P values < 0.05 were considered to be statistically significant. All statistical analyses were performed using the SPSS software (version 18.0, SPSS Inc., Chicago, IL, USA).

## Results

***EpCAM expression:*** EpCAM expression was evaluated in 23 samples containing 12 carcinomas, 3 GID, and 8 IM. In normal gastric tissues of all samples, no EpCAM expression was seen, however in all of the GID, IM, and carcinomas samples, EpCAM overexpression was found. In the carcinoma samples, 76.4% of cells were positive for EpCAM, whereas in the GID and IM samples, this rate was 62.5% and 51.3%, respectively (Figure 1). The average staining intensity was $3^+$ in more than 80% of carcinoma cells and $2^+$ in GID and IM cells.

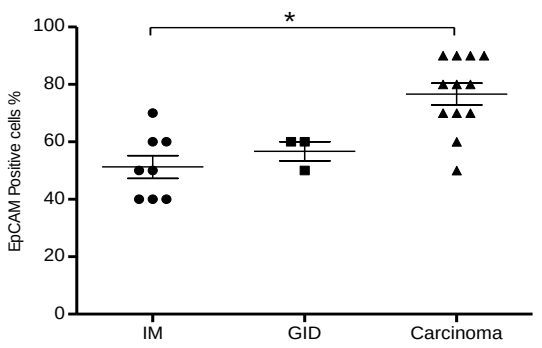


**Figure 1. Average epithelial cell adhesion molecule (EpCAM) positive cells in intestinal metaplasia (IM), gastrointestinal dysplasia (GID), and carcinoma. Data were represented as mean ± standard deviation (SD).**
P < 0.01 IM vs. carcinoma

***EpCAM expression and correlation with overall survival:*** Carcinoma samples were used to evaluate survival analysis. The samples with more than 75% positive cells showed a positive association with overall survival of patients (Long Rank, P < 0.05). The median survival time of patients with elevated EpCAM expression was 105 days in comparison with samples with lower EpCAM expression (45 Days) (Figure 2).

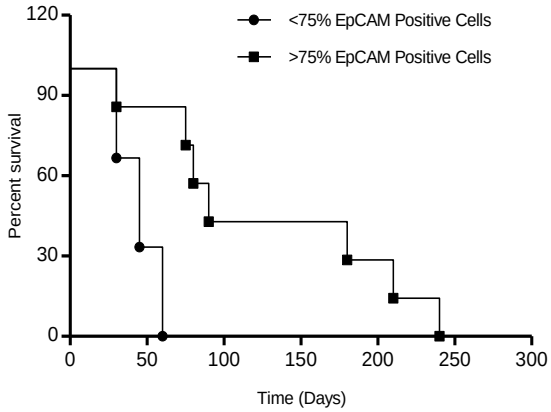


**Figure 2. Kaplan-Meier survival curve: overall survival analysis according to different percentages of epithelial cell adhesion molecule (EpCAM) positive cells among patients suffering from carcinoma.**

## Discussion

EpCAM is an adhesion molecule on the epithelial cells that is primarily identified as a tumor marker for carcinomas.[7,10,12] In this study, the EpCAM expression was investigated in different stages of gastric cancer in addition to the evaluation of the association of EpCAM overexpression with overall survival of patients with carcinoma. It was observed that EpCAM overexpression in all stages of gastric cancer (IM, GID, and carcinoma), while its expression in early stages, was lower than the advanced stage, and staining intensity in the advanced stage was more than the early stage. Accordingly, EpCAM has an important role in the carcinogenesis of gastric cancer. Kroepil et al. identified that in gastric cancer, EpCAM overexpression was correlated with higher tumor cell proliferation and higher lymph node metastasis.[5] Moreover, Wenqi et al. indicated EpCAM overexpression in gastric cancer tissues and cell lines. They revealed that EpCAM down regulation leads to cell proliferation decline, cell cycle arrest in SGC7901 and human gastric adenocarcinoma cell line (AGS) cells, and blocked tumor formation in nude mice.[1] In contrast with the results of the present study, Joo et al. revealed that EpCAM expression was higher in the early stage of gastric cancer.[13]

Differences in tissue processing and the use of different primary anti-EpCAM antibodies may be the likely reasons. EpCAM expression was used for the classification of gastric cancer[5] and as an ideal target for immunotherapy.[6]

Mukherjee et al. showed that the EpCAM was overexpressed in the tumor stroma of prostate cancer.[14] Yanamoto et al. found EpCAM overexpression in squamous cell carcinoma (SCC) of the tongue and EpCAM expression was related to invasion pattern, tumor size, and regional lymph node metastasis.[15] Pak et al. identified EpCAM overexpression in SCC of lung cancer.[16]

## Conclusion

In conclusion, the current results revealed that in the early stage of gastric cancer, EpCAM expression was increased and its expression was elevated with the progress of the tumor. However, EpCAM overexpression showed lower survival in a patient with carcinoma. Nevertheless, it should be taken into account that this experiment was carried out on a limited number of patients and further studies employing a high number of patients are required.

## Conflict of Interests

Authors have no conflict of interests.

## Acknowledgments

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# Chronic inflammatory lesions of the jaws and orofacial tissues

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Original Article

## Abstract

**BACKGROUND:** Chronic inflammation is a persistent inflammation characterized by tissue repair which may occur around the jaws due to varying causes. This study aims to review its clinico-pathologic features.

**METHODS:** The study location was the Oral Pathology Laboratory, University College Hospital (UCH), Ibadan, Nigeria. Archival records were examined and all entries made as histopathological diagnosis of a chronic inflammatory lesion were identified and included in the study. The clinical data regarding age, gender, site of lesion, clinical diagnosis, and histopathological diagnosis were extracted from the histopathology reports of the patients. Data were presented using summary statistics and analysed with the SPSS software. Chi-square test was used to test the association between age, gender, and histopathological diagnosis. Statistical significance was set at $P < 0.050$.

**RESULTS:** Orofacial lesions diagnosed as chronic inflammatory lesions were 95, constituting 4.6% of 2046 diagnoses made. They occurred mostly in the 21-40 years age group recording 34 (35.8%) of cases. The mean age of men was 36.6 ± 19.0 years, while for women was 49.0 ± 21.5 [t = -2.82, degree of freedom (df) = 95, P = 0.006]. Women were more affected while the mandible was the most commonly affected site, making up 43.2% of cases. Non-specific chronic inflammation was the most frequently diagnosed lesion constituting 32.6% of cases followed by chronic osteomyelitis constituting 30.5%.

**CONCLUSION:** Summarily, chronic inflammatory lesions are rarely seen around the jaws and orofacial region. Larger studies on these rare lesions are advocated to further assess their prevalence globally.

**KEYWORDS:** Chronic Disease, Inflammation, Jaw, Face

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## Introduction

Chronic inflammation is a prolonged and persistent inflammation characterized by tissue repair, often as a continuation of an acute form or a prolonged low-grade form.[1] It is a localized protective response caused by injury or which serves to destroy, dilute, or wall off both the injurious agent that is not easily digested and the injured tissue. The inflammatory response can be provoked by prolonged exposure to physical (e.g., trauma, ultraviolet radiation), chemical (e.g., acid, oxidizing agents), and biological agents including infectious agents such as bacteria (e.g., Staphylococcus spp., Streptococcus spp.), viruses (e.g., paramyxovirus), and other pathogenic microorganisms (e.g., protozoan).[1,2] Chronic inflammatory lesions of the jaws and orofacial tissues vary and may be caused by the spread of odontogenic (e.g., apical abscess) and non-odontogenic (e.g., carbuncles) infections, overlying soft tissue traumatic injury as well as infected extraction sockets and open fracture lines.[3] Similarly, other sources include hematogenous spread (e.g., from infected intravascular catheters and

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distant foci of infection), systemic infections and diseases [e.g., human immunodeficiency virus (HIV), diabetes mellitus (DM)], autoimmune diseases [e.g., synovitis, acne, pustulosis, hyperostosis, and osteitis syndrome (SAPHO syndrome)], primary chronic granulomatous diseases (CGDs), and some diseases of unknown aetiology (e.g., sarcoidosis).[2,3]

Chronic inflammation is characterized by infiltration with mononuclear cells (macrophages, lymphocytes, and plasma cells), tissue destruction (induced by the persistent offending agent or by the inflammatory cells), and attempts at healing by connective tissue replacement of damaged tissue, all occurring simultaneously with angiogenesis.[1] Macrophages are recruited and activated by the action of lymphokines to phagocytose certain microorganisms as well as to process antigens, allowing them to be neutralized by lymphocytes. Likewise, they secrete monokines that attract other cells and cause tissue destruction.[1] T-lymphocytes are the predominant cells in chronic inflammation activated by monokines and at times, directly by antigens. Activated lymphocytes in turn destroy antigens or render them harmless while secreting lymphokines that stimulate macrophages.[1] Other mediators in the chronic inflammatory process include B-lymphocytes that aid in the manufacturing and secretion of antibodies against specific antigen.[1] Moreover, eosinophils contain granules with major basic proteins for destroying parasites and are seen in parasitic infestations, hypersensitivity reactions, and some autoimmune conditions.[1] Furthermore, lymphokines and monokines recruit fibroblasts to the site of chronic inflammation to produce collagen, which may become excessive if cause of inflammation is persistent, leading to fibrosis.[1]

Moreover, a type of chronic inflammation is granulomatous inflammation which is composed of aggregates of the mononuclear phagocyte system and characterized by well demarcated focal lesions described as granulomas with a background of reparative tissue.[4,5] Distinguishing feature is the presence of activated macrophages which have an epithelioid appearance diagnostic of chronic granulomatous inflammation, with or without giant cells.[4,5]

Furthermore, previous studies have examined the occurrence of different chronic inflammatory conditions in the orofacial region either as a series or as case reports on interesting findings.[6-9] Gaetti-Jardim Jr et al. discussed their management of patients with jaw chronic osteomyelitis in Brazil, emphasizing the role of anaerobic organisms in its aetiology as well as its susceptibility to b-lactams and clindamycin.[6] Similarly, Adekeye and Cornah reviewed 141 cases of chronic osteomyelitis of the jaws in a Nigerian population, noting a preference for the maxilla in the first decade of life.[7] Moreover, Sezer et al. reported four cases of actinomycotic tuberculosis (TB) occurring in three women and a man in Turkey, equally affecting the maxilla and mandible,[8] while Rattan and Rai also highlighted the management of extra pulmonary TB in a few Indian patients.[9]

Conversely, there is a dearth of studies appraising the occurrence of all chronic inflammatory diseases in the jaws and orofacial region. Thus, this study aims to review the clinico-pathologic features of chronic inflammatory lesions diagnosed at the Oral Pathology Laboratory, University College Hospital (UCH), Ibadan, Nigeria.

## Materials and Methods

The study location was the Oral Pathology Laboratory, UCH, Ibadan. The archival records were examined and all entries made as histopathological diagnosis of a chronic inflammatory lesion involving either the jaws or orofacial tissues from January 1990 to December 2016 were identified and included in the study. Only cases with complete and

adequate records were included while cases with incomplete records were excluded. The clinical data regarding age, gender, site of lesion, clinical diagnosis, and histopathological diagnosis were extracted from the histopathology reports of the patients using a data collection form. Cases were further sub-classified into two groups namely those with specific diagnoses signifying certain disease entities occurring in known sites and those with vague non-specific diagnosis which were not related to particular disease entities or sites. Data were presented using summary statistics and analysed with the SPSS software (version 21, IBM Corporation, Armonk, NY, USA). Chi-square test was used to test the association between age, gender, and histopathological diagnosis. Statistical significance was set at $P < 0.050$.

## Results

Over the study period, 95 orofacial lesions were diagnosed as chronic inflammatory lesions, constituting 4.6% of 2046 histopathology diagnoses. The age group of 21-40 years had the highest occurrence with 35.8% of cases, while mean age of 43.6 ± 21.3 years was obtained. The mean age of men was 36.6 ± 19.0 years, while for women it was 49.0 ± 21.5. There was a statistically significant difference between these mean ages. [t = -2.82, degree of freedom (df) = 95, P = 0.006]. Moreover, there was a female preponderance of 1.3 in this study. The most commonly affected site was the mandible making up 43.2% of cases and majority of the cases constituting 80 (84.2%) had no underlying systemic disease (Table 1).

The most frequent histological diagnosis was non-specific chronic inflammation constituting 31 (32.6%) followed by chronic osteomyelitis 29 (30.5%), while chronic sialadenitis, foreign body granulomas, and chronic sinusitis all recorded 6.3% of cases. Moreover, the most common clinical findings in these lesions were swellings in 49.5% of cases, followed by swellings with pus discharge in 31 (32.6%), and ulcerations in 9 cases (9.5%) (Table 2).

**Table 1. Characteristics of patients by socio-demographics, site of lesion, and co-existing disease**

| | Frequency | Percentage |
|---|---|---|
| Age group (year) | | |
| ≤ 20 | 15 | 15.7 |
| 21-40 | 34 | 35.8 |
| 41-60 | 21 | 22.1 |
| 61-80 | 22 | 23.2 |
| ≥ 81 | 3 | 3.2 |
| Gender | | |
| Men | 41 | 43.2 |
| Women | 54 | 56.8 |
| Site of lesions | | |
| Mandible | 41 | 43.2 |
| Nose | 2 | 2.1 |
| Maxilla | 8 | 8.4 |
| Submandibular glands | 7 | 7.4 |
| Palate | 7 | 7.4 |
| Tongue | 5 | 5.2 |
| Antrum | 7 | 7.4 |
| Others* | 18 | 18.9 |
| Co-existing disease | | |
| Nil | 80 | 84.2 |
| DM | 2 | 2.1 |
| Hypertension + DM | 2 | 2.1 |
| Hypertension | 3 | 3.2 |
| Asthma | 3 | 3.2 |
| Others** | 5 | 5.2 |

* Floor of mouth- 2, lips- 3, labial mucosa- 2, face- 3, parotid gland- 2, cervico-mandibular- 1, neck- 2, cheek- 1, buccal mucosa- 2

** Sickle cell disease- 1, hypertension + hyperthyroidism- 1, peptic ulcer- 1, human immunodeficiency virus (HIV)- 1, hypertension + leukemia- 1

DM: Diabetes mellitus

Following sub-classification, lesions were grouped as follows: the specific group consisted of chronic osteomyelitis, TB lymphadenitis, actinomycosis, eosinophilic granuloma, Wegener's granulomatosis, chronic sinusitis, mucormycosis, chronic sialadenitis, Kimura's disease, sarcoidosis, and Garre's osteomyelitis; while foreign body granulomas, chronic inflammations, and chronic granulomatous inflammations were

considered to be non-specific. More women constituting 34 (61.8%) were found in the specific histodiagnosis group; however, the non-specific diagnoses were equally distributed between both genders (Table 3).

**Table 2. Distribution of patients by histological diagnosis and clinical findings**

| | Frequency | Percentage |
|---|---|---|
| Histological diagnosis | | |
| Chronic osteomyelitis | 29 | 30.5 |
| Chronic sialadenitis | 6 | 6.3 |
| Foreign body granuloma | 6 | 6.3 |
| TB lymphadenitis | 4 | 4.2 |
| Wegener's granulomatosis | 2 | 2.1 |
| Non-specific chronic inflammation | 31 | 32.6 |
| Chronic granulomatous inflammation | 3 | 3.2 |
| Chronic sinusitis | 6 | 6.3 |
| Others* | 8 | 8.5 |
| Clinical findings | | |
| Swelling | 47 | 49.5 |
| Swelling + pus discharge | 31 | 32.6 |
| Ulceration | 9 | 9.5 |
| Pus discharge | 2 | 2.1 |
| Others** | 6 | 6.3 |

* Garre's osteomyelitis- 1, Eosinophilic granuloma- 1, Sarcoidosis- 1, Kimura's disease- 1, Mucormycosis- 2, Actinomycosis- 2
** Pain- 1, swelling + pus discharge + facial nerve palsy- 1, swelling + ulceration- 1, swelling + fever- 1, ulceration + pus discharge- 1, oro-antral fistula + pus discharge- 1
TB: Tuberculosis

Moreover, both specific and non-specific diagnoses recorded the highest frequency in the 21-40 years age group, but this was not statistically significant (Fisher's exact test = 6.00*, P = 0.190) (Table 3).

Figures 1-3 show the histopathology findings of this study.

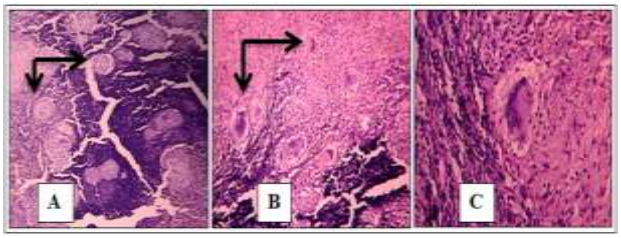


**Figure 1. Tuberculous lymphadenitis** showing A- numerous necrotizing granulomas [Hematoxylin and eosin (H&E) staining, ×40]; B- multinucleated giant cells (H&E, ×40); C- Langhans' type multinucleated giant cells (H&E, ×100)

## Discussion

All chronic inflammatory lesions of the jaws and orofacial tissues are scarcely reported conjointly. They exist separately mostly as case reports and series, due to their varied aetiopathogenesis.[6-9]

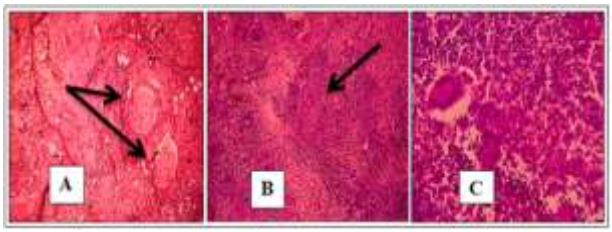


**Figure 2. Sarcoidosis** showing A- necrotizing granulomas [Hematoxylin and eosin (H&E) staining, ×40]; B- multinucleated giant cells (H&E, ×40); C- Langhans' type multinucleated giant cells (H&E, ×100)

**Table 3. Association between patients' histodiagnoses and age/gender**

| | Specific (n = 55) [n (%)] | Non-specific (n = 40) [n (%)] | $\chi^2$ | Df | P |
|---|---|---|---|---|---|
| Gender | | | 1.32 | 1 | 0.250 |
| Men | 21 (38.2) | 20 (50.0) | | | |
| Women | 34 (61.8) | 20 (50.0) | | | |
| Age group (year) | | | 6.00* | | 0.190 |
| ≤ 20 | 9 (16.4) | 6 (15.0) | | | |
| 21-40 | 19 (34.5) | 15 (37.5) | | | |
| 41-60 | 11 (20.0) | 10 (25.0) | | | |
| 61-80 | 16 (29.1) | 6 (15.0) | | | |
| ≥ 81 | - | 3 (7.5) | | | |

* Fisher's exact test
Df: Degree of freedom

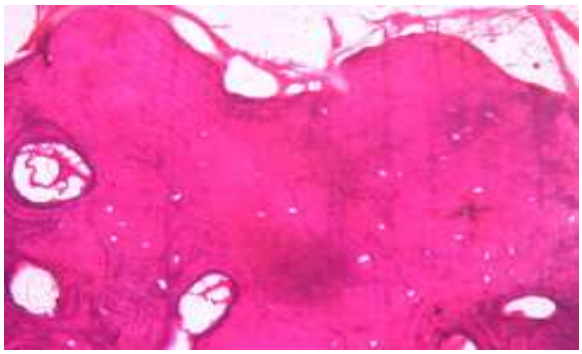

**Figure 3. Chronic Osteomyelitis** showing necrotic bone with empty lacunae [Hematoxylin and eosin (H&E) staining, ×40]

In this study, these lesions occurred most in the 21-40 years age group compared to other age groups.

This finding is contrary to common belief that old and elderly patients are more susceptible to oral diseases,[10] considering the various factors that may interfere with oral health status in elderly patients.[10,11] Moreover, other demographic and clinical parameters such as gender of patients as well as site of chronic inflammatory lesions were assessed in this study. There was a slight female predilection, while the mandible was the most prevalent site of occurrence. These outcomes were however not statistically significant. The female gender has been reported to express higher levels of immunoreactivity in comparison to men, which affords them increased resistance to many types of infections but increases their susceptibility to autoimmune diseases.[12] Moreover, women have a more active humoral and cell-mediated immunity,[13] thus making them more susceptible to chronic inflammatory conditions, probably due to increased sensitivity to aetiological agents of chronic inflammation.

The most commonly diagnosed disease in this study was non-specific chronic inflammation accounting for 31 (32.6%) of all chronic inflammatory lesions seen. The microscopic features of the lesions were typified by chronic inflammatory cell infiltration, angiogenesis, and fibrosis not specific of any defined lesion. Considering the various functions of the oral cavity and the presence of a large population of microorganisms, non-specific chronic inflammation as seen in the present study is not unexpected due to the numerous sources of chronic irritation that may exist intraorally.[14,15]

In this study, chronic osteomyelitis was the next most prevalent lesion to non-specific chronic inflammation. Osteomyelitis of the jaws are chronic lesions characterized by inflammation of the jaw bones and their marrow spaces.[3] It may manifest either as suppurative or non-suppurative form,[16] often as a result of polymicrobial infection including alpha haemolytic Streptococci, Staphylococcus aureus, Bacteroides, and Fusobacterium species.[3,6] Moreover, it may occur due to less virulent organisms or following failure of resolution of the acute infective phase due to inadequate treatment.[3,6] Clinical features of chronic osteomyelitis include a dull aching pain with slightly indurated swelling of the affected jaw and presence of an intra-oral or extra-oral discharging sinus.[3] Typically, in the chronic focal sclerosing type, the mandibular first molar is commonly the source of infection and it radiographically appears as a well-circumscribed radio-opaque mass of sclerotic bone around the affected molar tooth,[17] 50% of cases are seen in patients under 30 years of age.[18] In the chronic diffuse sclerosing type, older age group is commonly affected. They exhibit a mixed radiolucent/radiopaque appearance on radiograph.[19] Another distinct form of chronic osteomyelitis is Garre's osteomyelitis, typically seen in children and young adults. Radiographically, it is characterized by concentric layers of calcification described as the "onion skin" appearance of the affected part of the mandibleon radiograph.[20] Diagnosis of gnathic

osteomyelitis is often by clinical findings. However, histology of gnathic osteomyelitis is used to supplement and can be used in combination with clinical and radiological findings.[21] Secondary chronic osteomyelitis with suppuration may resemble acute osteomyelitis showing large amounts of polymorphonuclear leukocytes, macrophages, and plasma cells, along with a variable degree of marrow fibrosis, necrotic bone, and reactive bone formation; while secondary chronic osteomyelitis with a more chronic course would have a lymphocytic infiltrate instead.[3]

Previous studies have reported the prevalence of jaw osteomyelitis in various populations.[7,22,23] Prasad et al. reported 84 cases of osteomyelitis of the head and neck over a 10-year period, diagnosed based on clinical and radiological findings.[22] Similarly, Daramola and Ajagbe had earlier reported 34 cases of chronic osteomyelitis,[24] while Adekeye and Cornah reviewed 141 cases based on clinical features.[7] In addition, Singh conducted a prospective study of 21 cases of chronic suppurative osteomyelitis.[23] In this study, chronic osteomyelitis constituted 30.5% of chronic inflammatory lesions of the jaws and 1.4% of all biopsies over the study period, which is less than what was obtained in other studies.[7,22,23] This may be due to the use of only cases that had histological diagnosis of chronic osteomyelitis in obtaining data as employed in this study, while most studies largely utilized clinical records.[6,7,22-24]

Additionally, chronic inflammation within and around the jaws may include chronic granulomatous lesions such as those caused by specific infections involving bacteria such as mycobacteria, syphilis, and actinomycosis. Fungal infections such as histoplasmosis and aspergillosis species as well as parasitic infections such as leishmaniasis may likewise be seen.[3,4,8,9,25,26] This study recorded 4 (4.2%) cases of TB lymphadenitis. TB is a chronic infectious disease caused by the tubercle bacillus bacteria, mycobacterium TB.[27,28] Transmission occurs by droplet infection from airborne particles of an infected person with the primary site of implantation being the lungs.[27,28] Orofacial TB is a rare presentation of extrapulmonary TB[29] which could be primary, commonly seen in children as well as adolescents or the secondary form seen more in middle-aged and elderly patients.[30] Various forms of presentation of orofacial TB exist including TB lymphadenitis which is the most common type of extrapulmonary TB seen,[31] constituting all the four cases seen in this study. Other forms are TB ulcers which are the most common oral TB presentation,[30] TB gingivitis, TB periapical granuloma, TB osteomyelitis, and rarely TB of the temporomandibular joint (TMJ).[32] Histopathology of TB is that of a necrotizing granulomatous lesion consisting of central areas of caseating granulomas with associated peripheral rims of epitheloid histiocytes and giant cells of the Langhans' type. Exterior to these are outer rims of lymphocytes and plasma cells.[2,29]

Actinomycosis is a rare suppurative and granulomatous chronic infectious disease caused by Actinomyces spp., an anaerobic gram-positive bacterium.[33,34] This study recorded 2 (2.1%) cases of actinimycosis seen in a 14-year-old boy and a 67-year-old woman occurring as gingival and mandibular swelling, respectively. Actinomyces spp. exists as commensal in the human respiratory and digestive tracts, invading deeper tissues via mucosal lesions.[33,34] Most common predisposing factors are of odontogenic origin involving the perimandibular regions usually following trauma or surgery. Other sites, including the tongue, sinuses, middle ear, larynx, and thyroid gland may be affected.[35,36] Rarely, the TMJ could also be involved.[37] Cervicofacial actinomycosis is the most common form constituting 50% of all cases seen.[33,34] Characteristically, it is seen as a

gradual progressive painless indurated swelling with draining sinus tracts on the skin or oral mucosa, occasionally discharging thick yellow exudate with distinctive sulfur granules.[34,38] Definitive diagnosis is by culturing bacteria from the lesion, macroscopic demonstration of the classic sulfur granules in tissue specimens, and histologic examination revealing granulomatous inflammation with a central zone of necrosis which contains multiple basophilic granules that signify lobulated micro-colonies of filamentous actinomyces.[34,38]

Common to all granulomatous lesions are the presence of granulomas on histopathology.[2,4,39] This feature is seen in other chronic inflammatory lesions with orofacial manifestations including sarcoidosis, Crohn's disease, and orofacial granulomatosis.[4,40] Foreign bodies, chemicals, and drugs may also provoke a chronic granulomatous inflammation in the orofacial region.[4,39] Sarcoidosis is a rare idiopathic multi-systemic non-caseating granulomatous disease.[41] Pulmonary involvement occurs in nearly 90% of cases, while 25% occur in skin and 10%–15% affects the head and neck region.[42] Oral sarcoidosis is rarely seen, while accompanying chronic multi-system sarcoidosis may seldom occur in the acute stage.[41,42] The oral lesions may be solitary, multiple, or part of a widespread disease. In some instances, oral involvement occurs first, or could be the only manifestation of the disease.[43] The case of sarcoidosis seen in this study was diagnosed in a 38-year-old man, presenting as part of a multi-system disease involving the lungs, skin, and tongue.

Accounts of oral sarcoidosis recorded in literature are case reports and series.[43,44] However, Suresh and Radfar reviewed 68 cases of oral sarcoidosis and reported a female predilection, slight racial preference for Caucasians, and a median age of 37 years.[41] Moreover, oral soft tissues were more commonly affected than the jaw bones with the buccal mucosa and gingivae being most affected.[41] The most common mode of clinical presentation was localized swellings, while ulcerations, gingivitis, gingival hyperplasia, and gingival recession were the less commonly seen presentations.[41] Histological appearance of the lesion shows typical sarcoid granulomas with non-caseating necrosis.[2,43,44]

## Conclusion

This study presented a review of the clinico-pathologic features of chronic inflammatory lesions of the jaws and orofacial tissues. While the cases obtainable over the study period may constitute a majority of these lesions, the use of histopathology records as engaged in this study excluded lesions where diagnoses were based on clinical and radiological parameters. Summarily, chronic inflammatory lesions of 'non-plaque origin' are rarely seen around the jaws and orofacial region. They are slightly more common in women and in the 21-40 years age group. The mandible was the most commonly affected site, while non-specific chronic inflammation and chronic osteomyelitis were the most frequently seen lesions. Larger studies on these rare lesions are advocated to further assess their prevalence globally.

## Conflict of Interests

Authors have no conflict of interests.

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# A case report of stomach and esophagus melanoma with liver metastases in a 63-year-old woman

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Case Report

## Abstract

BACKGROUND: Melanoma originates from melanocytes, which are dendritic pigmented cells. Malignant melanoma is divided into cutaneous and non-cutaneous types, and cutaneous one is the most common type. Gastric melanoma has rarely been reported, and is divided into primary and secondary categories.

CASE REPORT: We report a 63-year-old woman with continues epigastric pain complaining of bloody defecation with elucidated blood, lack of appetite, weight loss, and icteric skin. She was a known case of hypertension, and a surgery of the left eye mass was done for her, which the patient's eye was discharged completely. The patient's biopsy sample was not sent for pathology, and there was no pathology result. The patient was evaluated with endoscopy because of epigastric pain of 6 months before. In addition to class A esophagitis, a nodule with an approximate dimension of 1 cm was seen in the Z-line of the esophagus, and two black lesions in the greater curvature of the stomach were seen, which biopsy of all these lesions was done. In the pathological study of biopsy specimens in a microscopic view, the replication of scattered hotspots in submucosa with atypical cells, large nuclei, and dark brown pigmentation were observed. In the immunohistochemistry study, HMB-25, Ki-67, carcinoembryonic antigen (CEA), and S100 were positive. Ultimately, the patient was diagnosed with melanoma.

CONCLUSION: This report demonstrates the importance of medical documentation in determining the origin of diseases. as, if there was documentary evidence of the evacuated eye mass, differentiation of the primary or metastatic melanoma was possible.

KEYWORDS: Melanoma, Skin Neoplasms, Metastasis

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## Introduction

Melanoma originates from melanocyte, which is a dendritic pigmented cell. These cells are located in the epidermis, hair follicles, eyes, ears, and meninges. Malignant melanoma is divided into cutaneous and non-cutaneous types. Cutaneous one is the most common type, which accounts for 91.2% of malignant melanoma. Non-cutaneous melanomas include 5.2% of ocular melanoma, 1.4% of mucosal melanoma, and 2.2% of melanoma with unknown origin.[1] The most involved area in mucosal melanoma is the anorectal area, and the cases of the esophagus, stomach, and small intestine are uncommon. Gastric melanoma has rarely been reported in articles which are divided into primary and secondary categories.[2]

In the meantime, the secondary type is more common than the early one. The pathogenesis of the primary gastric melanoma is still unclear, but mechanisms such as the migration of melanocyte cells, neoplastic transformations, and decarboxylation of cells into melanocytes have been proposed.[3,4] Blecker et al. have developed some criteria for the diagnosis of early gastric

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melanoma, including 1. lack of any primary defect, 2. lack of history of any defects of the skin related melanoma or to other organs that have been removed, 3. lack of extra-intestinal metastases expressive melanoma, and 4. presence of intramucosal membrane that is close to the epithelium.[5]

Due to the low incidence of the disease, there is no formal therapeutic protocol for gastrointestinal melanomas, especially gastric melanomas. However, in papers, gastrectomy has been suggested not only to maintain therapy but also to increase patient survival.[6] The role of chemotherapy, immunotherapy, radiotherapy, vaccination, and other possible treatments is still under discussion.

## Case Report

Here, we report a 63-year-old Caucasian woman who referred to the emergency department of the Tohid hospital in Sanandaj City, Iran, with a chief complaint of severe abdominal pain in the epigastric region. The patient's pain was occasional in the past 75 days, but became continuous and severe over the past 3 days. During this time, the patient complained of a bloody defecation with elucidated blood, lack of appetite, weight loss, and icteric skin. The patient did not complain from shortness of breath, coughing, sputum, and hemoptysis. Moreover, there was no complaint of dysuria, frequency, and hematuria.

In the past medical history, she was a known case of hypertension, and a surgery of the left eye mass was done for her, in which, the patient's eye was discharged completely, and she had a prosthesis. In her last surgery, the patient's biopsy sample was not sent for pathology, and there was no pathology result.

The patient's vital signs at the time of entry were stable, blood pressure: 124/75 mmHg, respiratory rate: 18 per minute, pulse rate: 84 per minute, and temperature: 37 °C. In the physical examination, she was restlessness with a bitemporal cachexia. She had a clearly icteric skin. There was no positive point in the examination of the head and neck, and the patient's jugular venous pressure (JVP) was elevated. There was no whirring sound in the heartbeats, and respiratory sounds were normal. There was an obvious distention in the abdomen. The patient's liver was exposed 9 cm below the ribs by palpation. The lower limbs have +++ edema. In primary biochemical laboratory tests, fasting blood sugar (FBS) of 60 mg/dl, blood sugar (BS): 142 mg/dl, blood urea nitrogen (BUN): 39 mg/dl, creatinine (Cr): 1.56 mg/dl, Na: 133 mEq/l, K: 4 mEq/l, erythrocyte sedimentation rate (ESR): 3 mm/hour, C-reactive protein (CRP): 20 mg/l, prothrombin time (PT): 18 s, partial thromboplastin time (PTT): 49 s, international normalized ratio (INR): 2.4, total protein: 5.2 g/dl, albumin: 2.3 g/dl, total bilirubin: 16 mg/dl, direct bilirubin: 10.5 mg/dl, aspartate aminotransferase (AST): 219 IU/l, alanine aminotransferase (ALT): 85 Iu/l, alkaline phosphatase (ALP): 1371 IU/l, lactate dehydrogenase (LDH): 7360 IU/l, creating phosphokinase (CPK): 100 IU/l, white blood cell (WBC): 10000 /µl, red blood cell (RBC): 4.01 million/µl, hemoglobin (Hb): 14.9 g/dl, platelets (Plt): 300000 /µl, and troponin: negative were reported.

The patient was evaluated with endoscopy due to epigastric pain of 6 months prior to admission. In addition to class A esophagitis, a nodule with an approximate dimension of 1 cm in the Z-line of the esophagus and two black lesions in the greater curvature of the stomach were seen, which biopsy of all these lesions was done. In a pathological study of biopsy samples in the microscopic view, the replication of scattered hotspots in submucosa with atypical cells, large nuclei, and dark brown pigmentation were observed. In the immunohistochemistry staining, HMB25, Ki67, CEA, and S100 were positive. Ultimately, according to the microscopic view and immunohistochemical staining, the

patient has been diagnosed with Gastric or stomach melanoma.

While hospitalization, regarding the size of the liver, a sonography was done in which the liver was larger than normal size, and multiple solid and cystic centers were seen throughout the liver. But, the assessment of internal and external hepatic and bile ducts could not be done. Abdominal computed tomography (CT) scan was performed for further evaluation in which multiple echogenic masses with different sizes in liver parenchyma were reported which suggested metastatic lesions.

## Discussion

Melanoma involves 1-3 percent of malignant cancers, which often occurs in the natural places of the presence of melanocytes.[4] This cancer is considered as an invasive cancer. Gastrointestinal system melanoma is usually due to metastasis. Nonetheless, there are cases of primary gastrointestinal melanoma reports.[2-4,6-17] Esophagus melanoma is the most common form of primary gastrointestinal melanoma.[4]

Based on the criteria presented by Blecker et al.,[5] researchers have considered the theory of early gastrointestinal melanoma as quite possible. In this case, there was no initial lesion (first criterion), and presence of the previous melanoma was not clear (second criterion); because there was no eye mass pathology result. The detection of esophageal melanoma lesions were prior to the metastatic hepatic lesions (third criterion). And ultimately, pathologic evidence confirmed the diagnosis (fourth criterion). Therefore, the diagnosis of early gastrointestinal melanoma was detected.

This report demonstrates the importance of medical documentation in determining the origin of diseases. Because, if there was documentary evidence of the previous eye mass, the differentiation of the primary or metastatic melanoma was possible. In any case, gastrointestinal melanoma is rare, which is reported in this article.

## Conflict of Interests

Authors have no conflict of interests.

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