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Auditing the Compliance with the Principles of Nurse - Patient Communication at Psychiatric Wards of Shahid Beheshti University of Medical Sciences in 2014

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Abstract

Introduction: Establishing communication with patients is one of the most important duties of a nurse, so that a nurse can improve the quality of nursing care though setting a correct and effective communication with patients.

Purpose: This study was conducted with the aim of auditing the compliance with the principles of nurse - patient communication at psychiatric wards of Shahid Beheshti University of medical sciences in 2016.

Method: In this descriptive study (audit approach), 100 cases of nurse – patient communication were selected and observed in psychiatric wards at the selected hospitals affiliated to Shahid Beheshti University of Medical Sciences using the event sampling method in 2016. Data were gathered through a demographic questionnaire for nurses and a checklist of nurse – patient communication. The data were analyzed using descriptive statistics, two-sample independent t-test and variance analysis at the significance level of P<0.05.

Results: The conformity rate of nurse - patient communication principles with the standards was 76.31% which is an acceptable level.

Conclusion: The degree of compliance with nurse-patient communication principles in psychiatric wards of Shahid Beheshti University of Medical Sciences in 2016 was satisfactory. However, to better improve this communication, training the nurses and clinical monitoring of managers are recommended.

Keywords: Auditing, Nurse patient communication, Psychiatric ward, Communication.

Introduction

Humans are social creatures that communicate through the exchange of feelings, attitudes, and emotions, thereby provide their physical and mental needs (1). Communication means verbal and nonverbal transfer of information (2) and it is a dynamic process between humans used to influence on each other and gain mutual support and what is necessary for health, growth, and survival. Communication is one of the central concepts of the nature of nursing and an important part of nursing jobs (1). In fact, the nurse-patient communication leads to numerous caring behaviors that are the base for providing high quality nursing care (2).

In nursing profession, communication and communication skills play a very important role in solving patients’ problems; especially in patients with mental disorders since impairments in cognitive, emotional and insight areas make communicating with them so difficult leading to their reduced provision of information and participation in treatment programs (3).

Patients and nurses are the main communication factors in hospitals and communication with patients is one of the key roles of nurses that contribute to care improvement, patient recovery, and professional and social development.
of nurses’ personality (4). Improper communication can hinder a patient's recovery and may even permanently deprive the patient of health or life; on the contrary, optimal communication is more effective in patients than the treatment with medication. In fact, nurses will be successful in their work when they are able to establish an optimal communication with their patients (5). Statistics also show that majority of public complaints and incorrect application of directives by patients are not the result of incompetence healthcare workers, but they originate from communication problems (6). Therefore, providing high quality nursing care requires creation of a meaningful communication by nurses with patients and an ongoing assessment of them (2).

Auditing is one of the important components of clinical governance program (7) as well as one of the ways used to improve and evaluate the quality of patient care. Auditing is gathering facts in relation to a particular problem which is done systematically and offers strategies to improve the quality of nursing care. In fact, auditing evaluates the root of a performance and also the outcome of a specific performance (8). Auditing patient care is a kind of control that specifies the status quo of the patient care and accordingly problems and bottlenecks can be identified and the required plans can be implemented to resolve them (9). The purpose of the audit of patient care is to enhance the quality of patient care, staff training, and analysis of nursing care (10). Auditing is a management control work using nursing standards (11). The term “standard” in nursing activities means a desired quality by which the nursing care provided to a patient or a group of patients can be evaluated. Use of standards increases the quality of care and directs the nurses to correct goals (12). Standard in Psychiatric Nursing is fulfillment of professional commitment in order to improve the profession. The focus of standards is on the performance of individuals. Reviewing and understanding the situation, diagnosing and planning nursing measures, applying and implementing designated projects and finally evaluating these actions by the standards of nursing are used in each center (13).

One of the most important principles in psychiatric nursing is nurses’ communication with patients (14) and given that incorrect action is always associated with complications, these complications are seen as a concern in the action and speech in non-normative communication. This concern is a chain of negative and relatively uncontrollable thoughts and imaginations in psychological problems that may be associated with one or more negative consequences. By communication, nurses become aware of the needs and internal motivations of the patients with mental disorders and take care of them because feeling pain and illness in patients with mental disorders are expressed through communication. In addition, always duration and the way of communication is essential in the hope and positive attitude of the patient to the treatment team, thereby the patient attains the motivation to deal with the disease and trust the nurse that is particularly important in the diagnosis, treatment and progression of the disease (15).

Therefore, comparing the communication of nurses with patients with the existing standards can be followed by programing to enhance the work quality of psychiatric nurses. By estimating the distance between the existing care and standards, the problems are appeared based on which some suggestions can be offered to improve the quality of psychiatric nursing services, close the gap between the existing care and standards, and thus increase psychiatric nursing services. Given the importance of communication with patients with mental disorders, the role of psychiatric nurses in creating an effective communication with the patients and the importance of comparison between the quality of the current nurse-patient communication and the approved standards as well as the fact that no research has been done with this purpose in the country, it is necessary to measure this issue, so that the results can be used in the correct and scientific advancement of accreditation program in order to improve the community health level and the relationship between psychiatric nurses and the patients. Therefore, the present study was carried out with the aim of auditing the conformity rate with the principles of nurse - patient communication at psychiatric wards of Shahid Beheshti University of medical sciences in 2016.

Materials and Methods

This descriptive study is a kind of audit studies which was done in psychiatric wards of the hospitals affiliated to Shahid Beheshti University of Medical Sciences in 2016. The population of the present study consisted of all kinds of cares associated with the communication of nurses with patients in psychiatric wards of the hospitals mentioned.

The required sample size was \( p=0.5, d=0.1 \) and \( z=1.96 \) and was calculated 100 using this formula:

\[
\begin{align*}
n &= \frac{Z_{1-\alpha/2}^2 \times P(1-P)}{d^2}
\end{align*}
\]
Time and event sampling was performed systematically by an observer (researcher) by visiting the sections mentioned in three working shifts of morning, evening and night. In the sampling of events, observation happens in specific situations, such as patients’ condition assessment, treatment interventions like medication, ECT and other nursing interventions. The data gathered in this study consisted of two parts: demographic information and the checklist of assessing the communication of nurses with patients. In the first part, demographic information that included variables of age, sex, level of education, work experience, work shifts, marital status, passing communication skills courses, adequacy of income, and years of being in a psychiatric ward. This part was completed by nurses and also time and frequency of communications were investigated. In the second part, the researcher-made checklist, which contained 21 items on how to communicate, was completed by the researchers. These items were developed by collecting and extracting information from credible research papers in Iran and the world, protocols and guidelines, and reference books. Checklist of communication principles contains information on how nurses communicate with patients in psychiatric wards that this information was designed in different terms. The response to the checklist consisted of two parts as follows: 1. Yes, which consisted of two parts: (A - Done correctly) this part was scored when the desired care was taken correctly and properly, (B - Done incorrectly) this part was scored when the desired care was not taken correctly and appropriately. 2. No, this part was scored when the desired care was not taken. The method of scoring was as follows: Not done (Score 0), done incorrectly (Score: 1), done correctly (Score: 2).

Face validity and content validity methods were used to determine the content validity of the checklist. For this purpose, the items of the checklist were judged and evaluated by 10 specialists, working nurses, and nursing faculty members in terms of relevance, clarity and simplicity of the content of the questions. To assess the reliability of the tool the method of agreement coefficient between observers was used which was calculated ICC=0.88.

To do the research, after obtaining ethics approval from the committee of ethics in medical research of International Branch of Shahid Beheshti University with code IR.SBMU.RAM.REC.1395.110 and also after receiving a referral letter from education unit of Shahid Beheshti University of Medical Sciences, the information was collected. Officials were assured about the confidentiality of the information. While using the sources, observance of trustworthiness was done by referring to books and papers used.

To analyze data, descriptive and inferential statistics (ANOVA and two independent samples t-test) were used by the help of SPSS 18.

Findings

The majority of nurses (69%) were female and 98% of them had undergraduate education. As Table 1 shows, the minimum and maximum ages were 24 and 43 years old, respectively and the work experience in psychiatric wards was in the range of 1 to 19 years.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>24</td>
<td>43</td>
<td>32.84</td>
<td>5.2</td>
</tr>
<tr>
<td>Experience in psychiatric wards</td>
<td>1</td>
<td>19</td>
<td>6.94</td>
<td>4.4</td>
</tr>
<tr>
<td>Overall experience</td>
<td>1</td>
<td>22</td>
<td>7.63</td>
<td>4.8</td>
</tr>
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</table>

Marital Status of the participating nurses showed that 70% were married and 30% were single. In considering employment status, 50 people (50%) were officially employed so that 17 persons (17%) were covenant contracts, 7 people (0.7%) were contracted, 12 people (12%) were plan employees and 14 people (14%) were sector employees. 99 percent of the participants had no desire to work overtime. Most subjects (83%) had rotation work shifts. According to the nurses participating in the study, 68 percent were satisfied with their jobs and 82 percent of them were not satisfied with the income of this job. 85 percent of nurses passed communication skills courses. The time of communication with patients for 90 percent of the participants was less than 10 minutes and the frequency of communication for 85% of them was less than 5 times in one's shift. In Table 2, frequency distribution of the principles of nurse-patient communication in psychiatric wards of Shahid Beheshti University of Medical Sciences
of Tehran was shown. According to this table, match the compliance of communication principles was 76.31% and nurses were weak only in the item of encouraging patients to talk more (31.5%).

There was a significant relationship between gender and the principles of communication using two independent samples t-test (p <0.05) so that females established better communication with patients. Level of education, marital status, work shift and willingness to work overtime had no significant correlation with the principles of communication with patients. Using ANOVA test, a significant relationship was observed between employment status, work shift and willingness to work overtime had no significant correlation with the principles of communication (p <0.05). There was a significant relationship between job satisfaction and income and communication with patients so that nurses satisfied with their jobs were more successful in compliance with the principles of communication as well as those who considered their incomes sufficient complied better with the principles of communication.

Table 2: Frequency distribution of conformity rate with the principles of nurse–patient communication in psychiatric wards of Shahid Beheshti University of Medical Sciences in 2016

<table>
<thead>
<tr>
<th>Question</th>
<th>Items</th>
<th>Correct Frequency (percent)</th>
<th>Incorrect Frequency (percent)</th>
<th>No Frequency (percent)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The nurse says hello to the patient at the beginning of the communication.</td>
<td>99 (99.0)</td>
<td>0</td>
<td>1 (1.0)</td>
<td>99.0</td>
</tr>
<tr>
<td>2</td>
<td>The nurse responds to the greetings of the patient at the beginning of the communication.</td>
<td>99 (99.0)</td>
<td>0</td>
<td>1 (1.0)</td>
<td>99.0</td>
</tr>
<tr>
<td>3</td>
<td>The nurse greets the patient at the beginning of the communication.</td>
<td>90 (90.0)</td>
<td>8 (8.0)</td>
<td>2 (2.0)</td>
<td>94.0</td>
</tr>
<tr>
<td>4</td>
<td>The nurse accepts the patient away from the cultural characteristics. (Race, ethnicity, religion)</td>
<td>95 (95.0)</td>
<td>4 (4.0)</td>
<td>1 (1.0)</td>
<td>97.0</td>
</tr>
<tr>
<td>5</td>
<td>The nurse accepts the patient away from social features. (Level of education, marital status, occupation)</td>
<td>94 (94.0)</td>
<td>5 (5.0)</td>
<td>1 (1.0)</td>
<td>96.5</td>
</tr>
<tr>
<td>6</td>
<td>The nurse accepts the patient away from economic characteristics. (Income, economic level)</td>
<td>90 (90.0)</td>
<td>8 (8.0)</td>
<td>2 (2.0)</td>
<td>94.0</td>
</tr>
<tr>
<td>7</td>
<td>The nurse builds up comfort for the patient during the conversation with the patient.</td>
<td>68 (68.0)</td>
<td>20 (20.0)</td>
<td>12 (12.0)</td>
<td>78.0</td>
</tr>
<tr>
<td>8</td>
<td>The nurse communicates with the patient with simple and understandable words.</td>
<td>87 (87.0)</td>
<td>11 (11.0)</td>
<td>2 (2.0)</td>
<td>93.0</td>
</tr>
<tr>
<td>9</td>
<td>The nurse does not stop the communication suddenly while the patient is talking.</td>
<td>36 (36.0)</td>
<td>35 (35.0)</td>
<td>29 (29.0)</td>
<td>53.5</td>
</tr>
<tr>
<td>10</td>
<td>The nurse uses a polite and friendly tone during communication.</td>
<td>70 (70.0)</td>
<td>28 (28.0)</td>
<td>2 (2.0)</td>
<td>84.0</td>
</tr>
<tr>
<td>11</td>
<td>According to the needs of the patient, the nurse gives the opportunity to the patient to talk.</td>
<td>50 (50.0)</td>
<td>32 (32.0)</td>
<td>18 (18.0)</td>
<td>66.0</td>
</tr>
<tr>
<td>12</td>
<td>The nurse uses relaxing words indicating affection during the conversation with the patient.</td>
<td>63 (63.0)</td>
<td>27 (27.0)</td>
<td>10 (10.0)</td>
<td>76.5</td>
</tr>
<tr>
<td>13</td>
<td>The nurse answers to the patient’s questions.</td>
<td>41 (41.0)</td>
<td>31 (31.0)</td>
<td>28 (28.0)</td>
<td>56.5</td>
</tr>
<tr>
<td>14</td>
<td>The nurse says his/her impressions of the patient’s condition to him/her. (Sadness, distress, anxiety, joy)</td>
<td>60 (60.0)</td>
<td>36 (36.0)</td>
<td>4 (4.0)</td>
<td>78.0</td>
</tr>
<tr>
<td>15</td>
<td>While talking with the patient, the nurse responds to the patient by shaking his/her head and facial expression to express attention to the patient.</td>
<td>56 (56.0)</td>
<td>33 (33.0)</td>
<td>11 (11.0)</td>
<td>72.5</td>
</tr>
<tr>
<td>16</td>
<td>The nurse speaks with a calm tone and measured words during the conversation with the patient.</td>
<td>71 (71.0)</td>
<td>23 (23.0)</td>
<td>6 (6.0)</td>
<td>82.5</td>
</tr>
<tr>
<td>17</td>
<td>The nurse pays attention to nonverbal communication of the patient (eye contact, tone and intonation, mode of dress, body movements).</td>
<td>70 (70.0)</td>
<td>25 (25.0)</td>
<td>5 (5.0)</td>
<td>82.5</td>
</tr>
<tr>
<td>18</td>
<td>The nurse encourages the patient when s/he sees positive points (personal hygiene, taking medicine, compliance with the regulations of the ward) in the patient.</td>
<td>67 (67.0)</td>
<td>29 (29.0)</td>
<td>4 (4.0)</td>
<td>81.5</td>
</tr>
</tbody>
</table>
19 The nurse respects the privacy of the patient. 25 (25.0) 40 (40.0) 35 (35.0) 45.5
20 The nurse uses humor in communicating with patients. 27 (27.0) 33 (33.0) 40 (40.0) 43.5
21 The nurse encourages the patient to continue talking. 18 (18.0) 26 (26.0) 55 (55.0) 31.5
Total 1376 (65.43) 458 (21.77) 269 (12.8) 76.31

Discussion and Conclusion

In this study, 100 cases of nursing care related to the principles of nurse - patient communication were observed. Conformity rate of the principles of nurse - patient communication with the standards was 76.31% which was assessed desirable.

In considering the items, the highest compliance of communication with standards was related to the items of nurse’s saying hello to the patient (99%) and also nurse’s response to the greeting of the patient (99%) which were desirable and then respectively the items of the acceptance of the patient away from social features (97%) and acceptance of the patient away from the cultural characteristics (96%) had the highest compliance of communication with standards. The lowest score pertained to the nurse’s encouraging the patient to continue to talk (31.5 %) which was reported as weak and was not consistent with the study of Salarvand et al. who showed in their study that 60 percent of the nurses tried to encourage patients to continue talk to solve their problems by communication. The reason for this difference in results can be due to the differences between the wards that were studied (16). In this study, compliance with the privacy of the patient by nurses was reported medium (45.5%) which is in line with the study of Aqajani and Dehghan Niri who reported 49.4% of the patients described the observance of their privacy at emergency department relatively good (17). Furthermore, the study conducted by Sarkheyl et al. expressed respecting the privacy of patients at 78.13 percent (18). Another study by Karro et al. (2005) conducted in Australia stated the violation of privacy in emergency department was 33% (19). According to the researcher, the differences in these studies may be due to differences in cultures in different cities and countries under the study or due to the differences in physical structure of the wards under the study. In this study of Fleischer et al. (2009), it was emphasized that different factors affect the nurse-patient communication that include three groups of variables: variables of care providers, patient-related variables and environmental and situational variables (20). Respecting the privacy of patients is emphasized in the creation of effective communication of medical team with patients, satisfaction of patients and calmness of patients. Despite the importance of this issue, when patients are admitted to the hospitals, they are not always able to control their privacy and their privacy is violated in different treatment situations by medical staff for different reasons. Violation of the privacy causes increased anxiety, stress, aggressive and violent behaviors in individuals (21).

In this study, 53.5% of the nurses did not interrupt the patient’s communication while the patient was talking which indicates an average level. Coiera et al. reached to the similar results in 2002 in Australia so that 69.4% of nurses did not interrupt the patient’s communication (22). Also, in a study conducted by Salarvand et al., it was found that 27 percent of all communications were interrupted (16). Differences in the results can be due to in the differences in use of tools, scoring system, and surveyed wards.

In this study, 69% of the nurses were female and according to the statistical data, female nurses had a significant difference in compliance with the principles of communication with male nurses. This finding is similar to the study of Safavi et al. that showed audio and verbal communication skills had a positive correlation with gender (p<0 .05) (24). The results showed that the subjects with master's degree were not significantly different in communicating with patients compared to bachelor's degree nurses. However, the study of Gholami et al. demonstrated a significant difference between communication skills and level of education (p<0 .05) (25). Existence of this difference may be due to the fact that Gholami et al. studied a much wider range of degrees. Nurses’ marital status showed no significant differences in this study, but Taqi Zadeh et al. and Siaamian et al. found that there is a significant correlation between marital status and the use of communication skills (26), (27). Results showed that nurses with the employment status of sector employees had more successful communication than the nurses with other employment status that reflects the impact of employment status on communication. This finding is similar to the study of Barati et al. that showed employment status had a significant relationship with using communication skills (28). In line with the results of the present study, a study conducted by Pope et al. in the U.S. proved the nurses with
morning shifts had a significantly better quality of communication with patients than the nurses with evening and night shifts (p<0.01) (29). In another study by Goudarzi et al. done in Tehran, there was a significant relationship between the quality of verbal communication of nurses with the working shifts of nurses (p<0.01) so that verbal communication of nurses was reported weak in morning and circulation shifts and good in evening and night shifts (30).

About job satisfaction, 68% of the nurses were satisfied with their jobs and nurses - patient communication between these nurses was not significantly different from the nurses who were not satisfied with their jobs (p<0.05). This finding was consistent with other studies (31), (32), (33). Davis stated in his study that it seem, communication skills and nurse - patient communication are affected by the nurses’ job satisfaction and applying these skills by nurses can increase their satisfaction with the work. This was consistent with the results of our study (34).

In this study, 85% of the nurses passed the course of communication skills which has a significant correlation with the compliance of the principles of communication (p<0.05) and this result is in line with the study of Namdar et al. (35). Tongue also writes: acquiring communication skills such as clinical skills takes place better through education (36).

The results of this study showed that nurses who were not satisfied with their income were less successful in the compliance of the principles of communication. Mirkamali showed in his studies that the most important factor in the lack of nurses’ satisfaction is poor payment and low income (37). Studies of Zahed et al. and Mirzabeigi showed payment method and promotion system as the most important dissatisfaction factors of nurses (38), (39). Income or wage is considered as the most important aspect of any job and according to the researcher, in nursing job in which many factors lead to the creation of dissatisfaction, low wages can lead to nurses’ increased leaving the work and dissatisfaction.

The number of nurse’s communication with a patient on a psychiatric ward is less than 5 times with 85 percent. In the variable of the duration of communication, most subjects (90%) spent less than 10 minutes to communicate with patients that this result is in line with the study of Sabzevari et al (40). They concluded that, on average, after 23 seconds of talking to patients, the conversation was stopped and only 28 percent of the patients fully expressed their concerns and this is a reason to prove the lack of focus on active listening skills among nurses. To be responsive to the desirable communication with patients, nurses need knowledge, understanding, and skills in human communication (41). Rana and Upton said that although the skills of conversation are dominantly used by employees, it is required that such skills be addressed as part of nursing education (42). It seems that lack of communication skills among providers of these services originates from inadequate trainings.

It has been proven in research that most important barriers in nurse - patient communication in professional environment can be the large workload of nurses, hardness of nursing work, lack of amenities, and physical and mental fatigue (38). According to the point that principles of nurse - patient communication were desirable, it seems that they can be strengthened and raised to a higher level by holding specialized training courses by planners and educational workshops for nurses. For the limitations of this study, it can be noted that the research environment was limited to only two hospitals and also there was the lack of similar studies.

Acknowledgments

This study was derived from post-graduate student thesis of psychiatric nursing and the research project approved by Research Council Authority of Shahid Beheshti University of with the code of IR.SBMU.RAM.REC.1395.110.

The researchers hereby appreciate the authorities of Nursing and Midwifery faculty, affiliated hospitals of Shahid Beheshti University of Medical Sciences and all colleagues participated and cooperated in this project.

References


8. Zaidabadi S. [Audit report for patient safety in hospital emergency departments] martyr Beheshti University of Medical Sciences in Tehran in 2013]. To obtain a master’s degree, School of Nursing, Martyr Beheshti University of Medical Sciences, Tehran, Iran.


Effects of Herbal Combination of Securigera securidaca, Vaccinium arctostaphylos, Citrullus colocynthis and Coriandrium sativum on Fasting Blood Sugar in Pre-Diabetic Elderly People

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ABSTRACT

Background and objectives: According to complications and inefficiency of pharmaceutical drugs in some cases, the use of herbs in improving blood sugar has always been attracted the attention of researchers. Therefore, the aim of present study was to investigate the effects of herbal combination of Securigera securidaca, Vaccinium arctostaphylos, Citrullus colocynthis and Coriandrium sativum on fasting blood sugar in pre-diabetic elderly people.

Materials and methods: In this single-blind randomized controlled trial, 60 pre-diabetic elderly patients aged 60-70 years with fasting blood sugar levels between 100 and 125 mg/dL were randomly divided into two groups of 30 subjects (drug and placebo). The patients in drug group received diet with 500-mg herbal capsules once a day and placebo group was administered by diet with placebo capsules (500 mg of flour) for the same period. After 30 days, fasting blood sugar levels were assessed in both groups. The data were analyzed using SPSS version 18 software.

Results: Based on the results of this study, after 30 days intervention, the fasting blood sugar level in the group received herbal capsules was significantly decreased compared to before the intervention (p =0.007), while the fasting blood sugar level and mean changes before and after the intervention were not significantly different between the two groups.

Conclusion: Due to the lack of effect of 30-day herbal combination intervention on fasting blood sugar in elderly people, it is recommended to be conducted further studies with regard to drug dosage and usage duration of medicinal plants.

Keywords: Elderly, Pre-diabetes, Securigera securidaca, Vaccinium arctostaphylos, Citrullus colocynthis, Coriandrium sativum

INTRODUCTION

Elderliness or aging is not a disease but is a vital phenomenon that involves everyone and in fact is a natural process in which physiological and psychological changes occur in the body (1). As the elderly population is rising, the risk of chronic diseases can be increased such as heart degenerative diseases, cancers, diabetes, hyperlipidemia, chronic respiratory disease, chronic musculoskeletal disorders (MSDs), digestive disorders, and neuropsychiatric diseases. Therefore, the elderly individuals over 60 years are often suffering from at least one chronic disease (2, 3). Diabetes is the seventh known cause of death around the world (3). Pre-diabetes is of the early stages of diabetes and a condition where blood sugar level though is not in the normal range, but still not considered diabetes. At this stage, the body is forced to produce insulin at higher than normal levels to regulate the blood sugar. The fasting
Blood sugar range is between 100 to 125 mg/dl in the pre-diabetes stage or before the diabetes, or between 140 to 199 mg/dl two hours after a glucose tolerance test (GTT) with 75 g glucose. Pre-diabetes status, even without turning into diabetes, increases the risk of complications such as cardiovascular disease (4). Pre-diabetes in healthy people with obesity and overweight can be one of the early indicators of before the onset of diabetes (5). Studies have indicated that lifestyle, adherence to a proper diet, physical activity, and use of some medicines play an important role to control the disease and prevent more developed stages (diabetes) (4). Given that the pre-diabetic patients have the highest risk of diabetes, and assessing and evaluating these people in the care system of the country is limited to once a year as well as implementation of interventions in this regard is limited, respective intervention in this field appears to be necessary (6). In addition, due to the age and poor health conditions in elderly, investigation of non-invasive, effective, safe and acceptable therapeutic methods that are able to maintain and restore their abilities can be a great help to return the patients to normal life. Nowadays, traditional and herbal medicine is of the most favorite therapies to treat the disease (7). Although the medicinal plants and their derivatives are used in treating the diabetes mellitus and its complications for a long time, but there is no evidence and credible research on the decisive effectiveness of many of them (8). Securigerasecuridaca, Vacciniumarctostaphylos, Citrulluscolocynthis and Coriandriumsativum can be mentioned as the medicinal plants that seem to play an important role in the treatment and control of diabetes. The reason for choosing these four sources of plant according to traditional medicine was based on this hypothesis that if these four medicinal plants are used simultaneously in a combination form, they could have a synergistic effect and neutralize each other's toxic effects (9). Of these four medicinal plants, Citrulluscolocynthis has laxatives properties (10), and Coriandriumsativum and Vacciniumarctostaphylos have anti-diabetes properties (11, 12); that is why, the Vacciniumarctostaphylos and Coriandriumsativum were combined with Citrulluscolocynthis to treat diarrhea complication of Citrulluscolocynthis. Several clinical studies with different results about the effects of these herbs have been published. Many studies on animals have indicated that these herbs are lowering the blood sugar and blood lipids and have other biological effects (13-18), but the number of studies on human about the effects of medicinal plants is limited, and there is no consensus about the blood sugar-lowering effects of these plants in studies on human. The study of Fallah Hosseini et al. (2006) on patients with type 2 diabetes demonstrated that Securigerasecuridaca plant had no impact on blood sugar (19), while Ibrahim et al. (2013) reported that this herb contains 19 amino acids that lower the blood sugar (20). Obidov et al. (2006) showed that the plant Vacciniumarctostaphylos in addition to the anti-diabetic effects has also the anti-inflammatory properties (21). Study of Fallah Hosseini et al. (2006) indicated that Citrulluscolocynthis could decrease the blood sugar (22). Gray and Flatt (1999) found that Coriandriumsativum causes the release of insulin and has an insulin-like activity (23). Despite the studies performed on this herb in humans and laboratory animals and their different results and due to the presence of substances with synergistic or neutralizing effect on the complications of medicinal plants, there is still no conducted study evaluating the effects of combination of these plants. Therefore, the current study was designed to investigate the effect of herbal combination of Securigerasecuridaca, Vacciniumarctostaphylos, Citrulluscolocynthis and Coriandriumsativum on fasting blood sugar of pre-diabetic elderly people.

Material and methods

Preparation of the herbal capsules and placebo:

After preparing the plants of Securigerasecuridaca, Vacciniumarctostaphylos, Citrulluscolocynthis and Coriandriumsativum, the samples were powdered; then 125 mg of the each plant was used to provide the 500-mg capsules. Placebo capsules were prepared similar in shape and color compared to the herbal capsules but without drugs, so that the ingredients of 500-mg placebo included flour, which has no effect on blood sugar. Based on traditional medicine, combination of these four medicinal plants should contain equal amounts of them in the capsule.

This single-blind placebo-controlled clinical trial with two groups was conducted on 60 pre-diabetic elderly people in Bushehr, Iran. Basic information to determine the sample size was obtained based on other studies and comparison of the treatment and control groups using the following equation:

\[
  n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}
\]
With considering 95% confidence level, 80% power and respective succession information in the above-mentioned equation, the sample size in each group was calculated 26 patients; by taking into account 10% attrition, 60 patients (30 patients in each group) were enrolled in the study. The present study was carried out with approval of the Research Ethics Committee of Bushehr University of Medical Sciences and Health Services, and with an ethical code of bpums.rec.1394.24. In order to adherence to the ethical considerations, the patients signed a consent form after explanation of the effects and possible side effects of the drug. The patients also were assured that in case of any complication event, they have right to discontinue their participation in the study. The samples were taken after registering the study in the Iranian Registry of Clinical Trials with a code of IRCT2015080822466N2. Inclusion criteria were age between 60 to 70 years, fasting blood sugar between 100 and 125 mg/dl, willingness to participate in the study and having an attendant that was able to adequately follow up, being mentally conscious and able to communicate verbally and respond to questions and presenting training and dietary advice to participants by researchers. Exclusion criteria included a history of taking blood sugar-lowering medications within two weeks before study, history of active cardiovascular disease and liver disease. In this study, demographic and medical information including age, gender, height, weight, body mass index, physical activity, educational level, occupation, gastrointestinal symptoms and consumed medications (if necessary) were collected using a self-describe checklist in a form of pre and post. Information on the results of laboratory values was also recorded in the mentioned questionnaire. Participants were selected out of those that referred to the diabetes clinic located in the Haft-e-Tir clinic and Mehr laboratory to perform blood glucose screening tests. The Haft-e-Tir clinic was selected because the diabetes clinic of the Bushehr city in Iran was located in this clinic and people over 30 years old had referred to this center to perform blood sugar screening tests and had documents there whose access was easier. The Mehr laboratory was chosen because the tests were supposed to be performed there. In order to implementation of the study, researcher referred to the diabetes clinic located in the Haft-e-Tir clinic, and information including name, age, gender, previous medical history, consumed medications and contact number were recorded from the documents of those who referred to perform blood sugar screening tests and had inclusion criteria. The researcher also referred to the Haft-e Mehr laboratory and reviewed the archived test results of the last month; information on the people, who had the inclusion criteria, including name, age and contact number was recorded by researcher and these people were called by the faculty of Nursing and Midwifery, and the study procedure was described for them. Those who were willing to participate in the study were asked to be fasting 10-12 hours before the test and refer to blood sampling room in the diabetes clinic of the Haft-e Mehr clinic in order to perform venipuncture. Followed by overnight fasting for 12-10 hours, 2.5 ml of venous blood sample was collected from each patient on days 0 and 31. After separating serum, blood sugar was measured by enzymatic method using Pars Azmoon kits and Cell Extra XL 1000 device. After 24 hours, the test results were given to the researchers and the patients were recalled again and asked to refer to the Diabetes Clinic of the Haft-e Tir clinic in order to receive their medications and diet form. At the beginning of the intervention, individuals were randomly (based on random numbers obtained from the Excel randomization software) divided into experimental and control groups. At this stage, the researcher presented the A and B prepared packages containing 30 plant or placebo capsules to the research unit. The research units received the necessary training on how to use the capsules, testing, the next visit, and side effects of medications and dietary form that were previously prepared by the researcher. Based on the instruction for the capsules consumption, the subjects were recommended to take one 500-mg capsule a day after breakfast or dinner. Patients were instructed about the possible side effects (abdominal pain and diarrhea), so that in the case of having such symptoms, they can use herbal Lomex Drop to resolve the abdominal pain and combination of low-fat yogurt and oak powder to treat the diarrhea. To investigate the possible gastrointestinal side effects and adherence to diet and drug regimen, the researcher contacted to the research units every other day, and reminded them to follow the diet and medication regimen. Potential gastrointestinal side effects were recorded in research at a week after starting the intervention and by the end of the intervention. During the days 25 to 28 of intervention, the participants were called and reminded to refer to the diabetes clinic at the Haft-e Mehr clinic for blood sampling within 24 hours after taking the last capsule. After data collection, data analysis was performed using SPSS version 18. Chi-square test was used to assess the qualitative data, independent t-test was used to compare the difference in blood glucose between drug and placebo groups and differences in blood glucose within a group was compare by paired t-test; if the variables had no normal distribution, Wilcoxon and Mann-Whitney tests were used. The significance level was considered 0.05%.

RESULTS

At the beginning of the intervention, 51 out of 60 patients participated in the study remained in the study until the end. Out of the 9 people who were excluded from the study, 5 patients were in the herbal capsules-receiving group
and 4 in the placebo group. The reason for excluding these peoples was the severe gastrointestinal complications in herbal capsules group and absence at the second time of blood sampling in the placebo group.

As seen in Table 1, there was no significant difference between the drug and placebo groups in terms of height, age and physical activity duration, and the only significant differences between the two groups were the Body Mass Index (p = 0.006) and weight (p = 0.03).
According to Table 2, 16 elderly people (64%) were female and 9 patients (36%) were male in the drug group and the majority of them were housekeeper (64%), with less than high school education (56%) and without physical activity (72%). In the placebo group, 15 of subjects (57.7%) were female, 11 (43.3%) were male and the majority of them were housekeeper (53.8%) with less than high school education (34.6%) and without physical activity (8/80%). There was no significant difference between the drug and placebo groups in terms of gender, occupation, educational level and physical activity. There was only a significant difference in terms of body mass index between the two groups (p=0.03).

* Fisher’s exact test
Table 3 shows that the mean fasting blood sugar before and after the intervention had no significant statistically
difference between the drug and placebo groups.

Table 3: Comparison of mean Fasting blood sugar between drug and placebo groups before and after intervention

<table>
<thead>
<tr>
<th>Fasting blood sugar (FBS)</th>
<th>Group</th>
<th>t or z</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drug (Mean ± SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>107.52 ± 7.82</td>
<td>-0.81</td>
<td>0.41</td>
</tr>
<tr>
<td>After</td>
<td>101.84 ± 10.46</td>
<td>0.73</td>
<td>0.46</td>
</tr>
</tbody>
</table>

*Mann-Whitney test

Regarding Table 4, the results showed that the mean fasting blood sugar had no significant statistically difference
before and after the intervention in the placebo group, while a significant reduction was found in terms of FBS after
the intervention than before in the group receiving Herbal Capsules (p=0.007).

Table 4: Comparison of mean fasting blood sugar before and after intervention separately in drug and placebo groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Blood sugar</th>
<th>t or z</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before intervention (Mean ± SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>107.52 ± 7.82</td>
<td>2.97</td>
<td>0.007</td>
</tr>
<tr>
<td>Placebo</td>
<td>104.62 ± 4.70</td>
<td>-1.01</td>
<td>0.31*</td>
</tr>
</tbody>
</table>

*Wilcoxon test

The results in Table 5 showed that the mean changes in fasting blood sugar before and after the intervention had no
significant difference between drug and placebo groups.

Table 5: Comparison of mean changes in fasting blood sugar before and after intervention between drug and placebo groups

<table>
<thead>
<tr>
<th>Mean changes in fasting blood sugar</th>
<th>t</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug group (Mean ± SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-5.68 ± 9.54</td>
<td>1.52</td>
<td>0.13</td>
</tr>
<tr>
<td>Placebo group (Mean ± SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.57 ± 18.31</td>
<td></td>
<td></td>
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</tbody>
</table>

Given that, BMI levels were significantly different between the two groups before the intervention, so the mean
changes in pre and post fasting blood sugar between two groups by controlling the BMI effect was evaluated using
univariate analysis. The results indicated that despite the controlled effect of BMI, there is no still significant
difference between the two groups in terms of mean changes in pre and post fasting blood sugar (p =0.35). Comparison of the mean FBS after the intervention between the two groups by controlling the BMI effect also showed that there was no significant difference between two groups in terms of fasting blood sugar after the intervention (p=0.79).

According to Table 6, comparison of gastrointestinal side effects between the two groups of drug and placebo a
week after the intervention and at the end of intervention showed that the gastrointestinal side effects in the drug
group in both time (a week after the intervention and at the end of the intervention) had significant statistically
differences compared to placebo (p=0.004).

Table 6: Comparison of gastrointestinal symptoms a week after intervention and at the end of intervention in drug and placebo groups

<table>
<thead>
<tr>
<th>GI effects</th>
<th>Group</th>
<th>P-value</th>
</tr>
</thead>
</table>
### Discussion

The results of present study demonstrated that consumption of thirty 500-mg herbal capsules per day significantly reduced the blood sugar in the intervention group compared to before, while there was no statistically significant difference between the two groups. In addition, the mean changes in fasting blood sugar before and after the intervention had no statistically significant differences between the two groups, and the herbal capsules had numerous digestive complications. Several studies have been reported different controversial results about the impact of each of this herb on blood sugar levels. Some studies have indicated that amino acids in *Securigerasecuridaca* could lower the blood sugar (20). Fallah Hosseini et al. (2006) investigated the effect of amino acids in *Securigerasecuridaca* plant on type II diabetic patients, and the results demonstrated that the fasting blood sugar and glycosylated hemoglobin had no statistically significant changes in comparison with the beginning of the intervention (19).

The results of Fallah Hosseini are in line with the findings of the present study and contrary to researches of Zahedi Asl (2005) and Rajai (2015) (15, 16), but the difference between the present study and Fallah Hosseini’s study was the type of selected patients, the dose and duration of consuming this herb, lack of common diet for both groups and that the individuals participating in the study were taking their medications without any changes. Study of Mirfeizi et al. (2012) on 75 patients with type II diabetes indicated that taking *Vacciniumarctostaphylos* capsules at a dosage of 500 mg twice daily over a period of 90 days leads to reduce the blood sugar (24); the results of this study are contrary to results of the present study and consistent with the results of Oviedo et al. (2006), which demonstrated that *Vacciniumarctostaphylos* has anti-inflammatory and anti-diabetic properties (21). Some strengths of the study of Mirfeizi was that they enrolled people without any adherence to any diet and exercise in order to unify the conditions of the test and control groups and to demonstrate the impact of *Vacciniumarctostaphylos*. However, in order to unify the conditions in the present study, a same diet was considered for both groups, but because of the age of the participants in the study, and that the majority of people were unable to do exercise, it was impossible to regard exercise routine for these patients. In order to control this confounding variable before the intervention, those who were doing exercise were recommended to continue their exercise as usual, and those who were not doing exercise were asked to keep the same condition. The difference between this study and the present study was the type of selected patients, age, intervention duration and dosage of this herb. Study of Fallah Hosseini et al. (2006) on 44 diabetic patients at a dosage of 300 mg *Citrulluscolocynthis* for 2 months indicated that the level of fasting blood sugar was significantly reduced compared to the placebo group (22). The results of Fallah Hosseini are contrary to the present study, but the difference between this work and the present study is the type of selected patients, the sample size, dosage, and intervention duration. Aissouai et al. (2010) demonstrated in their study that seed extract of *Coriandrium sativum* at a dosage of 20 mg/kg for 30 days reduced the blood sugar levels in mice compared with the control group (14); the results of this study are contrary to our research. The difference between this study and the present study is the type of samples that has been used to study, so that our study utilized human subjects. Today, many studies have been focused on the identification, isolation and detection of known active pharmaceutical plants and often they reflects the fact that a synergistic effect of a pharmaceutical compound can have stronger effect than a single drug; it also helps to neutralize the toxic effects of single compounds (25). Based on the conducted studies, leaves and fruit of the *Vacciniumarctostaphylos* have anti-diarrhea properties (11), and *Coriandrium sativum* is useful to treat diarrhea and abdominal pain (12). In addition, Fallah Hosseini et al. (2006) reported that the *Securigerasecuridaca* plant has no side effect, and its toxicity in laboratory animals has been investigated (19).
Citrullus colocynthis out of these medicinal plant is the only plant that in case of using at the higher dosages of 400 mg/kg could cause gastrointestinal side effects (diarrhea and abdominal pain) (26). However, the dosage of Citrullus colocynthis in the present study was 125 mg, but it caused severe gastrointestinal side effects; while in the study of Fallah Hosseini (22) and Rahbar (27), the used dosage of Citrullus colocynthis was 300 mg, but no gastrointestinal symptoms were reported. Therefore, it is likely that the combination of Citrullus colocynthis and Securigerasecuridaca plants has synergistic effects and causes severe gastrointestinal side effects. Overall, this study provides evidence that taking these herbal capsules have no effect on blood sugar that several factors can be involved in the cause of these results. The impact of each of these plants in different populations depending on various races and even in different individuals with different genetic factors, which each of them can play a different role in the development of prediabetes, are inconsistent with each other. In addition, in different studies depending on the dosage of each herb, the intervention duration and different sample sizes, contrary results have been reported. Probably, if the dosage of herbal ingredients used in the study were more or if the duration of intervention were longer than 30 days, there would be statistically significant difference between the two groups.

In the current research, same diet was administered for both groups in order to unify the conditions of the study and control of confounding variables, but there is possibility that none of the subjects were adhered to this regime. In addition, due to the age of people, it was impossible to consider the same exercise routine to all of them. However, there is a hypothesis that people in the control group have received training other than one given by the researcher, which could underlie no significant difference between the two groups, and it could be considered as the limitations of the study.

Conclusion

By comparing findings of this research with the results of other studies and mentioned restrictions in conducted researches compared to the present study, it seems that the different dosage and usage duration of these medicinal plants are effective on blood sugar. Because in the studies that were inconsistent with our results or used higher dosage and longer usage duration, it appears that these herbal capsules may be effective in reducing blood sugar levels if the drug dosage were higher or usage duration were longer. Therefore, due to limitations of the present study and the different results reported in various studies, further investigations are needed on the glucose-lowering role and gastrointestinal side effects of the herbal combination.

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Conflict of interest

The authors declare that there is no conflict of interest.

References


The Effectiveness of Acceptance and Commitment Therapy on Mental Health and Psychological Well-being in Female Breast Cancer Patients

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Abstract

Introduction: Acceptance and commitment therapy (ACT) is a third generation behavior therapy in treatment of mood and anxiety disorders. The purpose of this study was to investigate the effectiveness of acceptance and commitment therapy on mental health and psychological well-being in women with breast cancer.

Method: In this study which was a Quasi-Experimental with pre-test, post-test and control group, the sample group was selected by available sampling method from patients referred to the specialized cancer treatment centers redundant in Kermanshah, Iran, were selected through the convenience sampling method. Therefore, 40 female subjects were chosen randomly and assigned to two control & experimental groups (each with 20 subjects). To assess the severity of mental the 28-item General Health Questionnaire (GHQ), and psychological well-being short form Reef was used respectively in pre-test. The experimental group experienced the treatment based on acceptance and commitment therapy in eight; two hours sessions and the control group did not receive any treatment. These questionnaires again conducted on both group in post-test.

Results: The results showed that mental health and psychological well-being scores of experimental group significantly increased and in one-month follow up did not significantly differ. So, treatment based on the acceptance and commitment therapy caused significant changes in the treatment of mental health and psychological well-being in women with cancer.

Conclusion: According to the findings, acceptance and commitment therapy is efficacious on increase of mental health and psychological well-being of breast cancer patients. So it can be applied as useful method of intervention for improving psychological symptoms in patients with breast cancer.

Keywords: Acceptance and Commitment Therapy, Mental Health, Psychological Well-being, Breast Cancer

Introduction

Cancer is caused by abnormal cells and their out of control reproduction. Cancer cells grow and reproduce rapidly. This process usually begins when the genetic structure of cells is damaged (1). Breast cancer may spread in nearby lymph nodes, lungs, pleurae (lining of the lungs), bone (especially the skull), pelvis and liver. This cancer is rare before age 30, usually the maximum age for that is 65 years old. The breast cancer increases after menopause. After skin cancer, breast cancer is the most common cancer in women and after lung cancer, it is the leading cause of death for women in Western countries (2).

Cancer includes a group of more than 200 types of diseases (3), which can occur among people of any age, race, cultural background, and economic status (4). Notwithstanding significant advances in medicine, cancer continues to be known as one of the major diseases of the present century and the second leading cause of death after cardiovascular diseases (5). According to the statistics published in the Cancer Journal for Clinicians in 2014, 1,665,540 new cases of cancers have been known, causing 40,430 fatalities (6). In Iran, breast cancer consists 22.26% cases of women’s cancers; it is the most common form of cancer among Iranian women (7). So far, the
researchers have implicated potential risk factors, such as heredity, hormonal, reproductive and environmental factors such as lifestyle, especially psychological factors in breast cancer (8).

A cancer diagnosis can predispose patients and their families to deep emotional problems, such as stress, anxiety (9). Some of the reasons for the occurrence of problems in the field of mental health ensue from the implied meanings of this diagnosis in the minds of the patients and their families, such as the possibility of deformity, pain, financial problems, dependency, interrupter of the family structure, and death (10). Studies have shown that between 50 and 85 percent of cancer patients suffer from a psychiatric disorder simultaneously (11). Breast cancer is the most common cancer type and the second leading cause of cancer-related deaths in women in the United States (12). It has also been reported as the most common type of cancer and the second cause of death among Iranian women (13). The research results are indicative of the significant outcomes of breast cancer such as physical complications (pain and fatigue), psychological problems (anxiety and depression) and other psychological-social problems, all of which lead to the decrease in life expectancy especially with regard to the younger women (14).

Many treatments have been conducted for the health of the people with cancer such as group therapy, hope therapy, life skills therapy, cognitive-behavior therapy and Acceptance and commitment therapy (ACT). Molavi et al. (2014) say in their research that they have been able to reduce anxiety and depression (15). Iran, Doost et al. (2014) has also succeeded to reduce the women’s chronic backaches. They also remark that the ACT has promoted the life quality of the women with chronic pains(16). Chiesa and Serretti (2014) remark that both cognitive-behavioral and ACT lead to anxiety reduction (17). Also Lin et al (2015) have shown in researches that ACT along with audio and visual training and cyber texts are effective in physical pain reduction(18). Halliburton, Amanda and Lee (2015) remarked that ACT is an emerging though different type of cognitive behavioral treatment(19).

Due to the vital roles that the psychological well-being plays in various mental-social and even physical aspects of one’s life, numerous studies have been conducted about well-being and its components. Some scholars consider the psychological well-being the equivalent of happiness and emotional interaction with others (Ryff, 1995). Additionally, based on Ryff and Keyes’ pattern of psychological well-being, this construct comprises the six components of purpose in life, positive relations, personal growth, self-acceptance, autonomy, and environmental mastery. From this perspective, the health index is not defined as ‘lacking the disease,’ so that one’s well-being rather than sickness is emphasized(20). The debilitating nature of multiple sclerosis, affecting one’s personal, social, occupational, physical and mental life, is important from the viewpoints of both the patient due to the serious concerns about the disease and specialists and researchers who are still overwhelmed by the theoretical and practical ambiguities and failures regarding understanding this disease, especially its etiology, prevention, prognosis and treatment. Hence, the identification of programs in the form of training interventions towards improving the psychological well-being of these patients seems essential. So, the present study aimed to investigate the effectiveness of acceptance and commitment therapy (ACT) on the mental health and psychological well-being of women with breast cancer.

**Materials and Methods**

The present study also followed a pretest-posttest design with experimental and control groups, and the statistical population comprised all women with breast cancer patients visiting the specialized cancer treatment centers redundant in Kermanshah, Iran. Moreover, the simple random sampling was employed to select the breast cancer patients -stricken subjects (20 in each of the experimental and control groups) from the registered members of Imam Reza Hospital Kermanshah. It is worth noting that the number of subjects in the present study partially corresponded to the appropriate number of subjects suggested in the clinical literature, ranging from seven to ten members and in some other cases between ten and fifteen members. As for sample selection.

Inclusion factors: consent to participate in the program, 30 to 55 years of age, all people have chemotherapy and not to have any other physical effects other than breast cancer; exclusion factors were absence of treatment over 2 sessions and physical inability due to the growing trend of cancer.

After sampling, the subjects were randomly assigned to two experimental and control groups, and then the pretest was performed in both groups. After that, the experimental group was collectively provided with the independent variable, i.e., acceptance and commitment therapy (ACT), in eight 90-minute sessions once a week. As for the control group, no intervention was offered. Upon completion of the sessions, the posttest took place. The treatment plan given to the experimental group is briefly shown in Table 1.
The ACT protocol, which was based on an unpublished manual used in a previous study (21) focused on changing expectations from elimination of pain to living as well as possible with chronic pain. Discussions and experiential exercises were used to demonstrate the futility of control-oriented strategies such as thought suppression and attempts to eliminate pain, distress, and other negative experiences. Mindfulness strategies were taught in order to develop the skill of allowing negative experiences such as muscle tension or discomfort, negative thoughts, and emotional distress to pass through consciousness without requiring the expenditure of energy or psychological resources to control or alter them (22). Participants were also encouraged to identify their personal values and set and pursue short- and long-term goals consistent with those values in order to achieve improved quality of life and functioning.

Table 1. Session outlines for acceptance and commitment therapy (ACT)

<table>
<thead>
<tr>
<th>Session</th>
<th>ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The limits of control (short and long-term costs and benefits; finger traps), focus on experience (body scan)</td>
</tr>
<tr>
<td>2</td>
<td>Values (what you care about, how you want to live your life)</td>
</tr>
<tr>
<td>3</td>
<td>Cognitive defusion (observing thoughts without trying to evaluate or change them)</td>
</tr>
<tr>
<td>4</td>
<td>Mindfulness (being in the moment, raisin exercise)</td>
</tr>
<tr>
<td>5</td>
<td>Committed action (“road map” connecting values, goals, actions, obstacles, and strategies)</td>
</tr>
<tr>
<td>6</td>
<td>Review and continued action in support of values</td>
</tr>
<tr>
<td>7</td>
<td>Review and continued action in support of values</td>
</tr>
<tr>
<td>8</td>
<td>Moving forward</td>
</tr>
</tbody>
</table>

General Health Questionnaire (GHQ-28)

The questionnaire contained 28 questions and four sub-scales. Questionnaire subscales included: somatization, anxiety syndrome and insomnia, social dysfunction and depression syndrome. The overall score of each individual was the sum of individual scores obtained on the four subscales.

Multiple-choice type questions were based on the Likert scoring methods and options were scored as zero, one, two, and three. Rating of zero to 27 was considered as a sign of good general health, 28 to 55 was average general health, and 5 to 84 a sign of undesirable general health (23). In a study Palahang and colleagues who examined validation of the 28-item General Health Questionnaire, the reliability (assessed through test) was reported to be 0.91 (24).

Ryff’s Psychological Well-being scale (PWB)

This scale was developed by Ryff in 1980. The original scale contained 120 questions, but in further studies done afterwards, shorter forms of the scale were proposed with 84, 54, and 18 questions. In the present study, the 18-item scale was utilized with six-point Likert Scaling (ranging from strongly disagree to strongly agree). In addition, the validity and reliability of this scale has been reported in numerous preceding studies (20). In a study conducted by Dierendonck (2005), the internal consistency of the subscales of the psychological well-being scale (PWB) was appropriate, and their Cronbach’s alpha was between 0.77 and 0.90. The correlations of the psychological well-being scale (PWB) with life satisfaction scale, happiness inventory and Rosenberg self-esteem scale (RSES) were 0.47, 0.58, and 0.46, respectively. In a study performed by Khanjani and et al (2014), the reported internal consistency for the entire psychological well-being scale (PWB) was 0.94, and between 0.63 and 0.89 for the subtests. Moreover, in the present study, the correlation coefficient for the entire test through test-retest was 0.76, and between 0.67 and 0.73 for the subtests (p<0.001) (25).

S202-18
To analyze the collected data and given the research questions, the univariate ANCOVA was employed in addition to descriptive statistics. As for data analysis, the SPSS-23 was employed.

**Results**

Totally 40 women with the age range of 30-55 years were selected from the intended population and were included in the research.

Table 2 shows mean and standard deviation for scores of psychological well-being test in the studied groups in pretest-posttest and follow-up stages.

As seen in table 2, mean in the experimental group (Commitment and Acceptance Therapy) increased from 74.27 at pre-test stage to 86.33 at post-test stage. But no significant change was observed in the control group in pretest and posttest stages. Considering the difference observed in the mean of the study groups, average psychological well-being in experimental group indicates the effectiveness of the aforesaid procedure. In the experimental group (Commitment and Acceptance Therapy) decreased from 17.85 at pre-test stage to 14.69 at post-test stage. But no significant change was observed in the control group in pretest and posttest stages. Considering the difference observed in the mean of the study groups, average mental health in experimental group indicates the effectiveness of the aforesaid procedure.

The Leven’s test was used to assess the equality of variances in mental health and psychological well-being scores. The results of the Leven’s test are provided in Table 3.

In order to evaluate the presumptions of the analysis of covariance (ANCOVA), firstly the homogeneity of slopes of pretests and posttest scores were calculated. Multivariate ANCOVA was used to compare experimental and control groups with respect to mental health and psychological well-being scores. The results showed that the tests were significant (P<0.01). This means that there was a significant difference at least between two groups. The results are shown in table 4.

ANCOVA was conducted to find out the difference observed. Considering the calculated effect size, 76% of total variances of experimental and control groups was the result of effectiveness of the independent variable. Moreover, statistical power of the test was 0.76 which means that the test was able to reject the null hypothesis with a power of 76%. Table 5 only states that in one of the areas there is a significant difference between experimental and control groups. Multivariate analysis of covariance (MANCOVA) was used to distinguish which area was significantly different. The results are shown in Table 5.

Results of Table 5 show that there was a significant difference in psychological well-being dimensions including independence, dominance over the environment, self-development, Positive relation with people, being targeted in life, and self-acceptance between the two study groups. Overall psychological well-being with F=13.82 was significant (P= 0.001). Considering the Eta square of 0.45, it can be said that 45% of the changes in the dependent variable was due to effectiveness of the independent variable. In mental health between the two study groups. Overall mental health with F=7.75 was significant (P= 0.001). Considering the Eta square of 0.69, it can be said that 69% of the changes in the dependent variable was due to effectiveness of the independent variable.
Table 2. Mean and standard deviation of psychological well-being and mental health scores

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>Commitment and Acceptance Therapy</td>
<td>74/27</td>
<td>10/85</td>
<td>86/33</td>
</tr>
<tr>
<td>Control</td>
<td>74/32</td>
<td>10/18</td>
<td>74/83</td>
</tr>
<tr>
<td>Commitment and Acceptance Therapy</td>
<td>17/85</td>
<td>2/88</td>
<td>14/69</td>
</tr>
<tr>
<td>Control</td>
<td>17/75</td>
<td>4/50</td>
<td>17/21</td>
</tr>
</tbody>
</table>

Table 3. Results of the Leven’s test to examine the equality of variances in psychological well-being scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>df₁</th>
<th>df₂</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological well-being</td>
<td>3/5</td>
<td>1</td>
<td>28</td>
<td>0/06</td>
</tr>
<tr>
<td>Mental Health</td>
<td>1/45</td>
<td>1</td>
<td>28</td>
<td>0/24</td>
</tr>
</tbody>
</table>

Table 4. Results obtained from multivariate analysis of covariance on mean scores of posttest of variables in two groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig</th>
<th>Square Eta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pillai’s trace</td>
<td>0/79</td>
<td>14</td>
<td>2</td>
<td>0/001</td>
<td>0/76</td>
</tr>
<tr>
<td>Wilks lambda</td>
<td>0/23</td>
<td>14</td>
<td>2</td>
<td>0/001</td>
<td>0/76</td>
</tr>
<tr>
<td>Hoteling’s trace</td>
<td>4</td>
<td>14</td>
<td>2</td>
<td>0/001</td>
<td>0/76</td>
</tr>
<tr>
<td>Roy’s largest rot</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>0/001</td>
<td>0/76</td>
</tr>
</tbody>
</table>
Table 5. Results obtained from multivariate analysis of covariance (MANCOVA): mean scores of posttest of psychological well-being dimensions in the experimental and control groups

<table>
<thead>
<tr>
<th>Sources Change</th>
<th>Mean Square</th>
<th>Degrees of freedom</th>
<th>F</th>
<th>Sig</th>
<th>Square Eta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence</td>
<td>70/13</td>
<td>1</td>
<td>25/71</td>
<td>0/001</td>
<td>0/65</td>
</tr>
<tr>
<td>Dominance over the environment</td>
<td>17/14</td>
<td>1</td>
<td>5/92</td>
<td>0/001</td>
<td>0/45</td>
</tr>
<tr>
<td>Self-development</td>
<td>61/40</td>
<td>1</td>
<td>25/59</td>
<td>0/001</td>
<td>0/56</td>
</tr>
<tr>
<td>Positive relation with people</td>
<td>23/72</td>
<td>1</td>
<td>7/18</td>
<td>0/021</td>
<td>0/28</td>
</tr>
<tr>
<td>Being targeted in life</td>
<td>21/35</td>
<td>1</td>
<td>10/53</td>
<td>0/005</td>
<td>0/32</td>
</tr>
<tr>
<td>Self-acceptance</td>
<td>102/74</td>
<td>1</td>
<td>15/34</td>
<td>0/001</td>
<td>0/42</td>
</tr>
<tr>
<td>Total psychological well-being</td>
<td>1033/87</td>
<td>1</td>
<td>13/82</td>
<td>0/001</td>
<td>0/45</td>
</tr>
<tr>
<td>Total mental health</td>
<td>75/571</td>
<td>1</td>
<td>7/752</td>
<td>0/001</td>
<td>0/69</td>
</tr>
</tbody>
</table>

Discussion

The present study aimed to investigate the effectiveness of acceptance and commitment therapy (ACT) on the mental health and Psychological Well-being in Female Breast Cancer Patients. As the results of the present study demonstrated, the acceptance and commitment therapy (ACT) significantly enhanced the psychological well-being of patients with breast cancer patients in the experimental group compared to the control group. This result was consistent with the results of a study conducted by Rajabi et al. (2014). In which it was reported that the acceptance and commitment therapy (ACT) significantly enhanced the psychological well-being of women suffering from MS(26). In addition, this finding of the present study was concurrent with the results of a study conducted by Izadi et al. (2013), in which it was reported that the acceptance and commitment therapy (ACT) could lessen obsession, depression, and anxiety in patients suffering from MS(27). In acceptance and commitment therapy (ACT), patients are trained in mindfulness each session. By the same token, Brown & Ryan (2003) concluded that mindfulness and presence of mind increase one’s well-being (28). In line with the results of the present study, Arch and Craske (2005) concluded that the participants that concentrated for 15 minutes experienced mental clarity and reduced physical stress compared to those lacking such concentration(29). Given that it has been proven that psychological stress can activate multiple sclerosis (30), thus, not only does the commitment and acceptance therapy increase the psychological well-being, it also reduces stress in patients suffering from cancer, as a result of which the recurrence rate of this disease is lessened in these patients. Therefore, it seems that the psychological interventions, including the acceptance and commitment therapy, can play efficacious roles in increasing the psychological well-being and overall mental health of patients suffering from cancer.

Several studies have concluded that based on acceptance and commitment therapy is effective in improving mild to moderate depression (31), Obsessive–compulsive disorders (32), Psychosis or psychosis (32), psychological adaptation (33), smoking (34), Tinnitus (35), epilepsy and emotional eating after gastric banding surgery (36). The treatment has also been effective in non-clinical disorders such as stress in the workplace (37), mental health (38), well-being (39) and weight loss (40).

In this therapy, the practices of behavioral commitment along with defusion and acceptance techniques as well as detailed discussions about one’s values and goals and the need for specification of values all led to an increase in the psychological well-being of women suffering from Breast Cancer. Further, in this treatment, the main goal of placing greater emphasis on one’s inclination towards inner thoughts was to assist one to experience one’s worrisome thoughts just as a thought, to become aware of the inefficient nature of one’s current programs, and to handle what was of importance in one’s life in line with one’s values rather than responding to those thoughts. Here,
through replacing ego as background, clients could smoothly experience one’s unpleasant inner events in the present and were able to restrain oneself from nasty reactions, thoughts, and memories. In fact, it aimed to affirm one’s psychological flexibility. As the results of the statistical analysis showed, this approach led to a major rise in the psychological flexibility of this group of patients. In practice, the central processes of ACT teach one how to desist from worrisome deterrent thoughts, how to conceptualize such thoughts, how to affirm self-observation, how to accept rather than control the internal events, and how to clarify one’s values. In this therapy, one learns how to accept rather than desist from one’s feelings. It also raises awareness about one’s thoughts and thinking process and links them towards the realization of goal-oriented activities. In short, ACT aims to teach one to experience rather than obstruct one’s thoughts and feelings, and one is asked to do one’s utmost towards the realization of goals and values (26).

ACT is a behavioral treatment which utilizes mindfulness, acceptance, and cognitive departure skills to enhance psychological flexibility. In ACT the psychological flexibility is the increase in the visitors’ ability to establish relationship with their experience in the present, and to choose to act in a way that is consistent with their adopted values. Rajabi et al. (2014) state that ACT helps people become motivated, and that this motivation results in increase in expectancy (26). Also, Narimani et al. (2015) state that this treatment affects the individual’s hope through the promotion of self efficiency and positive self-image (41). Despite the importance of the third wave of cognitive-behavioral treatments including the ACT approach as an important area of emerging psychotherapy which is cited by researchers to have an effective role on stress, anxiety disorders, depression, and other clinical conditions, and since it has proved to be effective in the promotion of the lifestyle of the people with chronic pains (42, 43), only a few researches have dealt with the application of ACT techniques in treating patients with cancer. Hulbert-Williams, Esevi and Wilson (2015) are among the researchers who introduced ACT as an effective intervention in adaptability with cancer (44).

Since getting cancer requires strategies to make patients maintain the power to adapt to the treatment process, psychological education can play an important role in achieving this goal especially in the approach based on Acceptance and Commitment Therapy which believes authorities are never considered as failed, damaged or hopeless. Instead, the approach is always a form of empowerment that believes a meaningful life based on values, wealth is available for all people (45). In general, the admission facilitates the main processes of ACT for commitment (46). The implementation of group mindfulness-based intervention and acceptance and commitment therapy, while providing a platform to accommodate emotions, control and eliminate negative emotions and experiences deals and encourage the patients to follow the values and commitment to action based on values. As a result, it can be said that this leads to increasing the psychological well-being and mental health in women with breast cancer. Therefore, ACT can be applied as an appropriate intervention to improve the patients’ ability to cope with crisis cancer and to lessen its psychological side effects. The goal of treatment is, therefore, to start training based on knowledge and creative helplessness compared to previous solutions from the start and subjects’ (patients) acceptance of this novel attitude. According to the findings of the study, since variable of psychological acceptance increased before a significant decrease in indicators of mental health, it can be concluded that the variable of acceptance and increased attention and action value act as mediators in change and are effective in improving the indicators of psychological acute breast cancer.

One of the limitations of the present study was the limited number of the sample under study because the male patients were not included in the study. Accordingly, it is recommended that larger groups that includes men be investigated in future studies towards greater validity of this therapy with greater confidence. In addition, it is suggested that this method of treatment be compared to other methods to determine how they are different from each other.

Acknowledgments

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References


Prevalence Of Depression Among Hemodialysis Patients Admitted In Gorgan (Iran) During 2014

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ABSTRACT

Background: Hemodialysis, the main treatment for chronic kidney disease, is known as a stressful process followed by a lot of mental, emotional and social pressures. The aim of present study was to examine the prevalence of depression and related risk factors in hemodialysis patients.

Methods: In this cross-sectional study, all hemodialysis patients admitted to Sth Azar Hospital in Gorgan during 2014 were examined. Personal information including age, sex, ethnicity, educational level, marital status, occupation, financial condition and information about renal disease, including the period of hemodialysis, history of diabetes, hypertension, anemia and nutritional status were extracted from the medical history of the patients. For the mental conditions, the Beck Depression Inventory (BDI) was used.

Results: Mental status of only 16.1% of the patients was normal; and 83.9 % of patients showed signs for different levels of depression in their BDI test. The fact that 31.7% of the patients suffered from clinical depression is a proof for the seriousness of this issue and the necessity of it. Also, results showed that in these patients, the risk factors associated with depression were in relation with factors such as, marital status, occupation, the number of dialysis sessions per week and other variables.

Conclusions: This study was done for the first time in northeast of Iran and based on the results of present study recommended that the doctors and technicians should pay close attention to the patient’s mental condition in addition to hemodialysis.

Keywords: Depression, Gorgan, Hemodialysis, Prevalence

Introduction:

End-stage renal disease (ESRD) is a progressive and irreversible kidney disorder in which the body loses its ability to keep fluids and electrolytes in balance (1). In 2003 almost two million people suffered from kidney failure in the United States (1). The statistics show that each year there is a 15 % increase in the number of people with kidney
disorders in the world (2, 4). Hemodialysis as the main treatment for chronic kidney disease is a stressful procedure which is followed by a lot of emotional, psychological and social problems (5). Although hemodialysis will improve life span of the patients, it causes a lot of hardships like mental problems for the patients (6). Dialysis cannot compensate for the lack of metabolic activities, which is yet another reason for mental distress of the patient (7). Therefore, it is necessary to intervene psychologically as a major part of treatment in these patients.

Some of the known most common mental disorders in ESRD patients are depression, organic mental disorder, drug abuse and anxiety (8). There is no consensus about the severity of the emergence of psychiatric problems in dialysis patients, but everyone agrees that depression, and after that, anxiety are the most common sign of mental problem in these patients (9). Psychological disorders like depression may discourage the patient from following a diet compatible with their dialysis condition. Weight gain due to refusal of following an appropriate diet, excess fluid intake, malnutrition and sleep disorders are way more common in these patients than the patients who don’t suffer from psychological disorders (7, 8).

Although depression is very common among hemodialysis patients due to the similarity of its symptoms such as appetite loss, fatigue, restlessness, loss of libido and sleep disorders, with those of some physical illnesses, it’s very hard to diagnose (10). Therefore the epidemiology of depression induced by chronic kidney disease is still not very well known. On the other hand depression is one of the disorders that are very costly. In the United States depression is one of the top ten most costly diseases (11). This may be due to the fact that depression is an important factor in the patient’s refusal of treatment and lack of cooperation by the patient will add to their medical problems and endangers their health; eventually leading to premature death (12). Therefore an early diagnosis and an effective treatment of depression can improve the patient’s prognosis, quality of life, and survival rate (13-15).

For treatment, knowing the prevalence and risk factors of depression in any area is necessary; however, there is little research in this regard in North of Iran. So, the present study was designed to examine the prevalence of depression and related risk factors in some Iranian hemodialysis patients.

Materials and Methods:

In this cross-sectional study, which done during 2014 in Gorgan northeast of Iran, 194 hemodialysis patients whom were admitted to 5th Azar hemodialysis center were examined. Inclusion criteria were: being on hemodialysis, the age of over 18 years old and having the ability to answer the provided questionnaire. Personal information including age, sex, ethnicity, educational level, marital status, occupation and financial status, and the medical information like the period of hemodialysis, history of dialysis, number of dialysis sessions per week, dialysis efficiency, history of diabetes, hypertension, anemia, nutritional status, serum albumin level and vascular access sites for dialysis were extracted from the patients’ medical files. For examining the mental condition, Persian version of Beck Depression Inventory (BDI) was used. Beck depression inventory consists of 21 questions which analyzes the severity of depression and rates it from 0 to 63; in addition to screening. If the score is above 10 in healthy people and above 15 in dialysis patients it indicates depression. The severity of depression will be assessed based on the scores as follows: (11-16) mild depression, (17-20) mild depression with a need for therapy, (21-30) regular depression, (31-40) severe depression, (41-63) very severe depression.

The criteria for being excluded from the study were a known history of mental disorder and the use of antidepressants in the previous month.

Statistical analysis:

For data analysis we used SPSS v.21. Continuous variables were presented by mean and standard deviation. Spearman correlation coefficient, independent t-test and ANOVA were applied for correlation and comparison. P-value less than 0.05 were considered as statistically significant.
Results:

194 eligible hemodialysis patients entered the study. 14 patients were excluded because of a lack of willingness to cooperate. 180 patients cooperated in the study. Demographic data (age, gender, occupational status, marital status, and socio-economic status) of patients is shown in Table 1.

Table 1. Demographic data of patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>hemodialysis patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>54.01±13.9</td>
</tr>
<tr>
<td>Gender (Male N-%)</td>
<td>97 (53.8)</td>
</tr>
<tr>
<td>Occupational status (%)</td>
<td>10.6</td>
</tr>
<tr>
<td>Marital status (%)</td>
<td>15.6</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>126 (70%)</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>69 (38.3)</td>
</tr>
<tr>
<td>Dialysis duration (hrs)</td>
<td>3.7±0.3</td>
</tr>
<tr>
<td>Socio-economic status (%)</td>
<td></td>
</tr>
<tr>
<td>Poor Condition</td>
<td>47.2</td>
</tr>
<tr>
<td>regular condition</td>
<td>42.2</td>
</tr>
<tr>
<td>good condition</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Analysis on the Beck test scores of the patients showed that 29 patients (16.1%) were normal and 31.7% of the patients showed signs of severe depression in their results. The results are shown in the figure 1.

Figure 1: Frequency (%) of depression among the patients.
Mean depression score was higher in female patients than in male patients (31.3±8.1 vs. 21.8±5.4), the results of independent t-test showed a statistically significant difference (P=0.05). Results also showed that there is a relation between socio-economic status and depression. 94.11% of poor patients were more prone to severe depression versus 48.2% of rich patients (P <0.001). Married patients were more prone to depression, according to Beck test (69% with depression vs 31% normal, P<0.001), however, the differences in these test results were not noticeable in the single patients. (P>0.05)

<table>
<thead>
<tr>
<th>Table 2. Number and percentage of different level of depression among the hemodialysis patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>occupational status</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Employed</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>duration of dialysis</td>
</tr>
<tr>
<td>&lt;4 hours</td>
</tr>
<tr>
<td>≥4 hours</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Diabetic</td>
</tr>
<tr>
<td>Non-diabetic</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>With hypertension</td>
</tr>
<tr>
<td>Without hypertension</td>
</tr>
</tbody>
</table>

The results (Table 2) showed that employed patients had lower scores in the Beck test (P<0.001), increases in dialysis duration cause an increase in the possibility of depression (P<0.001), patients who suffered from diabetes had increased prevalence of depression (P=0.5), patients with hypertension showed signs of different degrees of depression (P=0.6).

**Discussion:**

The aim of the present study was to determine the prevalence of depression and its related risk factors in hemodialysis patients. According to the results of this study, 84% of hemodialysis patients reported some levels of depression. Findings also showed that increases in dialysis duration cause an increase in the possibility of depression.

In 2014 Afshaar et al, showed that there is a 70% prevalence of depression in hemodialysis patients in two hemodialysis centers in Tehran. 26.7 % of them suffered from severe depression. These results were almost in sync with this study. None of the variables including age, sex, underlying disease, dialysis duration, history of kidney transplant, anemia, marital status, occupational status and serum albumin level had a meaningful correlation with depression statistically. But in this study age, dialysis duration, marital status and occupational status had a meaningful relation with Beck test results. This difference in the results is an indicative of the need to analyze this subject deeper and more extensively. (9)
Mahmoody et al (2010) studied the level of depression in hemodialysis and kidney transplant patients. In their study, there wasn’t a significant difference between the two groups statistically, that is similar with our study. The degree of depression in women and men did not show any meaningful difference in comparison. In general, 93% of the dialysis patients suffered from depression with different degrees (mild to severe) that was higher than the finding of the present study. Regarding the relation of the depression level with age, sex, marital status and educational level, there wasn’t a meaningful difference. The results showed that the level of depression in each group is very high, and also the depression level is way higher in dialysis patients than transplant patients. By using self-evaluation tests and Beck Depression Inventory we can avoid the confusion of the similarity of the symptoms of ESRD and depression in diagnosis and screening of the depressed patients; which is a simple and low cost method of early diagnosis and treatment in these patients (11). The results of this study also suggest that dialysis patients should be under special attention for the possibility of depression.

In another study, Joshwa et al. examined the prevalence of depression, fatigue and sleep problems in hemodialysis patients in India.16 They used BDI and found out the prevalence of depression equal to 73% (59.7% reported mild and moderate level and 12.6% reported severe level) that was lower than the finding of the present study.(12)

Conclusion:

Overall, the findings of this study emphasize the prevalence of depression in hemodialysis patients; which is also correlated with factors like marital status, occupational status, employment status, economic condition, number of dialysis sessions per week, age, nutritional status and educational level of the patients.

With respect to the destructive impact of depression on the individual and their family, the doctors and technicians must pay special attention to psychological disorders in the patients, in addition to hemodialysis.

Conflict of interest

The authors declare that they have no conflict of interests.

Acknowledgements:

The authors gratefully thank the patients for their cooperation and thoughtful responses.

References:


Perspectives of Iranian mothers with cerebral palsy child about family coping

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Abstract

Introduction: The child with cerebral palsy is a serious challenge to families. It is essential to determine coping style adopted by these families.

Purpose: The aim of this study was to assess family coping and its dimension in Iranian mothers with cerebral palsy children and the relationship between demographic characteristic and family coping.

Materials and method: This was a descriptive study on 208 mothers with cerebral palsy children who referred to seven rehabilitation centers in Kermanshah, Iran. The subjects were selected through convenience sampling. The instruments were the demographic characteristics and family crisis Oriented Personal Evaluation Scales. The data was analyzed in SPSS (v16).

Results: The mean age of mothers was 32±6.4 years and mean age of children was 59±3.75 months. The mean family coping score was 97±16.80. Reframing and passive appraisal were the most and least common strategies used in the families from the mothers’ viewpoint. Age, job, education, type of cerebral palsy had no significant correlation with family coping.

Conclusion: Assessment of family coping is important and useful for the development of nursing intervention aimed at facilitating family adaption in families with a child with cerebral palsy.

Introduction

Parenting is a stressful job not to mention intensity of the stresses of having a child with a disability [1]. A child with disability is a serious crisis in the family [2]. Cerebral palsy is the third prevalent developmental disability and the top prevalent progressive motor disability that causes variety of motor-sensory problems, mental damages, developmental disorders, and functional limitations[3, 4]. Different countries publish inconsistent statistics as to prevalence of the problem; still, global prevalence of the problem is 2-2.5 per 1000 live births[5]. The statistics in this regard in Iran are not reliable[6].

Cerebral palsy is a complicated condition that creates different challenges for the child and family so that these families have to handle special stresses and needs[7]. Evidences hint that parents of these children experience stress level higher than those with normal children[8]. Brehaut et al. (2004) found that psychological distress and physical and emotional problems of care givers to cerebral palsy children (mothers in 95% of cases) were significantly higher than those of other care givers[9].

Functional limitations caused by cerebral palsy influences self-care capability of the child so that they need more attention. In many cases, these children live with the family and mothers are the main care givers[3, 10, 11]. Therefore, not only it affects the life of the child[12], the disabilities consume main portion of the energy of the family and mother in particular[13]. In general, the special needs of a cerebral palsy child cause general changes in the function of the family so that it leads to disassociation among family members in absence of a proper coping
strategy [14]. Researchers in coping field believe that the way people approach stresses may increase or decrease
the negative effects of life events and situations[15].

The main trend of papers about families with a disable child or children with chronic diseases once was to
emphasize on the negative outcomes for the family; however, recently the coping style and adaptation to the hard
situation have been accentuated[7]. Improvement of coping skills of the parents of children with chronic condition is
effective on attenuation of anxiety and depression[16] (Churchill, et al., 2010), adaptability of the parents and better
performance of children [17], and quality of life of the children[18].

Different families have their own unique and different coping strategy and system. Professionals need to know what
is the exact coping strategies used in a family and what approaches are most helpful for a family[1].

As providers of an efficient support services, nurses need to have insight into the family coping strategies with
disable children [19]. They can help the mothers to have better comprehension about their disabilities and strengths,
spot the problems, develop solutions, and learn about new coping strategies [1]. Mothers’ responses to the pressures
caused by having a disable children ranges from a variety of psychological distresses to a successful adaptation [4].
The extent of successful adaptation depends on using internal and external coping strategies. The internal family
coping strategies are rooted in the family and passive appraisal and reframing are among them[20]; while the
external family coping strategies are rooted in external sources. Families may also rely on the society and social
support[21]. Seeking support spiritual and acquiring social supports are of the external coping strategies[20]. The
families that use the both internal and external supports tend to be more efficient in adapting to stressful
situations[21].

Family coping strategies in families with cerebral palsy children have not been thoroughly examined[14]. As
recommended by the literature review, coping strategies and attitudes are functions of different factors such as
social, cultural, economic, and political backgrounds[22]. Cultural beliefs about disabilities are key factors in
family’s perceptions of children’s disability. Positive perceptions, on the other hand, have the key role in coping so
that they may lead to better coping with stressful events[23]. Determining how the parents use coping strategies to
manage problems[22] and knowing the differences are of clinical value for the professional practitioner[24]. When
the health providers learn that a family is dealing with adaptation problems, they can adopt most efficient
intervention depending on the situation [25]. The best way that health providers may ensure about efficiency of their
services is to evaluate family’s coping strategy as a whole[26]. The present study is an attempt to determine coping
style of family and its aspects from point of view of Iranian mothers with cerebral palsy children. Moreover, the
relationship between family coping and some of demographics of the mothers was examined.

Methodology

A descriptive cross-sectional study was carried out as a part of a PhD dissertation on nursing in Shahid Beheshti
University of Medical Sciences. Data gathering was done in a seven-month period from March 2015 to September
2015. Participants were 208 mothers with cerebral palsy child at the age range 1-12 years who referred to seven
rehabilitation centers in Kermanshah city. Inclusion criteria were definite diagnosis of cerebral palsy by a
pediatrician, the problem be diagnosed for more than one year, only one children with cerebral palsy or any other
disability in the family, the both parents live with the child, ability to speak Farsi, no mental disease in the mother.

The participants were selected through convenient sampling and the participants were briefed about the purpose and
process of the study before signing an informed letter of consent.

Data gathering tool included a demographics questionnaire (age, gender, type of cerebral palsy, duration of the
disease, gross motor function level, mother’s age/occupation/education, and number of children) and family crises
oriented personal evaluation scales (F-COPES) to determine family coping strategy and its aspects. F-copes was
designed by Olson, Larsen and McCubbin in 1981 including 30 statements designed based on Likert’s five-point
scale (1= completely agree,…, 5= completely disagree) with five subscales of passive appraisal, family mobilization
to acquire and accept help, seeking spiritual support, acquiring social support, and reframing. Maximum and
minimum scores are 150 and 30 respectively and the higher the score the better the coping behavior with stressful
situation.
Internal consistency of F-COPES ($\alpha = 0.86$) is supported and $\alpha$-value of the subscales ranges from 0.63 to 0.83. Retest consistency coefficient with four weeks internal is 0.81, which is acceptable. Subscales consistency coefficient was between 0.61 and 0.95 [20, 27].

The collected data was analyzed in SPSS (v.16) and the results were represented using descriptive and analytical statistics such as mean, standard deviation (SD), frequency, percentage, quantitative variables, and tables. To examine relationship between the variables, t-test, ANOVA, and post-hoc tests were used. Level of significant was ($p<0.05$).

**Results**

The demographical findings are listed in Table 1; 88.5% of the mothers were 20-40 years old, 11.5% were older than 40 years, 90.9% were housewives, and 83.6% had one or two children.

<p>| Table 1. Demographic characteristics of mothers of children with cerebral palsy, Kermanshah, Iran (2015) |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Cluster</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers’ age (year)</td>
<td>20-30</td>
<td>93</td>
<td>44.7</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>91</td>
<td>43.8</td>
</tr>
<tr>
<td></td>
<td>41+</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>Mothers’ education</td>
<td>Illiterate</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>Elementary</td>
<td>47</td>
<td>22.6</td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>55</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>77</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Higher education</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>Occupation</td>
<td>Housewife</td>
<td>189</td>
<td>90.9</td>
</tr>
<tr>
<td></td>
<td>Office employee</td>
<td>16</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>Number of children</td>
<td>1</td>
<td>102</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>72</td>
<td>34.6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>23</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>4+</td>
<td>11</td>
<td>5.3</td>
</tr>
<tr>
<td>Child’s age (months)</td>
<td>12-36</td>
<td>79</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>37-83</td>
<td>77</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>84-144</td>
<td>52</td>
<td>25</td>
</tr>
<tr>
<td>Gender of the child</td>
<td>Girl</td>
<td>99</td>
<td>47.6</td>
</tr>
<tr>
<td></td>
<td>Boy</td>
<td>109</td>
<td>52.4</td>
</tr>
<tr>
<td>Type of cerebral palsy</td>
<td>Quadruplegia</td>
<td>34</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>Diplegia</td>
<td>70</td>
<td>33.7</td>
</tr>
<tr>
<td></td>
<td>Hemiplegia</td>
<td>69</td>
<td>33.2</td>
</tr>
<tr>
<td></td>
<td>Athetoid</td>
<td>9</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Hypotonus</td>
<td>18</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>Atraxic</td>
<td>8</td>
<td>3.8</td>
</tr>
<tr>
<td>GMFCS</td>
<td>Level 1</td>
<td>41</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td>Level 2</td>
<td>30</td>
<td>14.4</td>
</tr>
<tr>
<td></td>
<td>Level 3</td>
<td>52</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Level 4</td>
<td>53</td>
<td>25.5</td>
</tr>
<tr>
<td></td>
<td>Level 5</td>
<td>32</td>
<td>15.4</td>
</tr>
<tr>
<td>Duration of disease (month)</td>
<td>12-24</td>
<td>47</td>
<td>22.6</td>
</tr>
<tr>
<td></td>
<td>25-36</td>
<td>48</td>
<td>23</td>
</tr>
</tbody>
</table>
Normal distribution for all the variables was tested and supported by Kolmogrov Smirnov (KS) (p>0.05). Table 2 lists mean score of family coping and the subscales; as listed, all the subscales were used in the families. Reframing and passive appraisal were the most and least common strategies used in the families from the mothers’ viewpoint. (Table 2)

In terms of the items of F-copes, the item No. 30 (I have absolute trust in God) and the item No. 29 (I inform my neighbors about my problems) obtained the highest (4.72) and lowest (2.03) mean scores respectively.

Results of t-test showed that mean score of family coping of the mothers was not significantly different in terms of mother’s type of cerebral palsy, gross motor function level, and duration of the disease (p>0.05; Table 3). The only significant difference in mean score of family coping in terms of the child’s gender of the children with cerebral palsy (p=0.289, f=0.332). ANOVA showed that there was no significant difference in passive appraisal coping strategy in terms of mother’s problem duration was less than three years.

Moreover, mean score of family mobilizing to seek support was higher in the mothers whose child’s problem duration was more than five years comparing with those whose child’s problem duration was less than three years. Morever, there was a significant difference in coping performance was in terms of mother’s age (p<0.05). Moreover, there was a significant difference in passive appraisal coping strategy in terms of mother’s age and occupation, and gross motor function level (Table 3). Post-hoc comparison showed that the mothers who worked in an office, older mothers, and those with children with gross motor function level of 4 and 5 had more tendency to passive appraisal. As to spiritual support and mobilizing family to seek social acceptance and support, Tukey test showed that mean score of spiritual support strategy was higher in the mothers with high school diploma than those with elementary education. Moreover, mean score of family mobilizing to seek support was higher in the mothers whose child’s problem duration was more than five years comparing with those whose child’s problem duration was less than three years.

### Table 2. The scores of F-COPES and its dimensions in mothers of children with cerebral palsy, Kermanshah, Iran (2015)

<table>
<thead>
<tr>
<th>Element</th>
<th>Minimum obtained score</th>
<th>Maximum obtained score</th>
<th>Mean</th>
<th>SD</th>
<th>Mean item score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquiring social support</td>
<td>9</td>
<td>45</td>
<td>24</td>
<td>9.6</td>
<td>2.66</td>
</tr>
<tr>
<td>Seeking spiritual support</td>
<td>6</td>
<td>20</td>
<td>14.5</td>
<td>3.6</td>
<td>3.63</td>
</tr>
<tr>
<td>Passive appraisal</td>
<td>4</td>
<td>20</td>
<td>9.9</td>
<td>4.9</td>
<td>2.49</td>
</tr>
<tr>
<td>Reframing</td>
<td>9</td>
<td>40</td>
<td>30.8</td>
<td>8.1</td>
<td>3.85</td>
</tr>
<tr>
<td>Mobilizing family to acquire and accept help</td>
<td>4</td>
<td>20</td>
<td>15</td>
<td>4.5</td>
<td>3.75</td>
</tr>
<tr>
<td>Total score of family coping</td>
<td>49</td>
<td>136</td>
<td>97.3</td>
<td>16.8</td>
<td>3.25</td>
</tr>
</tbody>
</table>

### Table 3. Relationships between scores on the F-COPES and demographic characteristics of mothers of children with cerebral palsy, Kermanshah, Iran (2015)

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Acquiring social support</th>
<th>Seeking spiritual support</th>
<th>Passive appraisal</th>
<th>Reframing</th>
<th>Mobilizing family</th>
<th>F-COPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers’ education</td>
<td>F</td>
<td>Sig</td>
<td>1.50</td>
<td>2.44</td>
<td>1.59</td>
<td>0.419</td>
</tr>
<tr>
<td>Job of mother</td>
<td>F</td>
<td>Sig</td>
<td>2.343</td>
<td>0.099</td>
<td>0.126</td>
<td>0.178</td>
</tr>
<tr>
<td>Type of cerebral palsy</td>
<td>F</td>
<td>Sig</td>
<td>0.231</td>
<td>0.949</td>
<td>1.224</td>
<td>0.972</td>
</tr>
<tr>
<td>GMFCS</td>
<td>F</td>
<td>Sig</td>
<td>1.361</td>
<td>0.249</td>
<td>0.351</td>
<td>3.764</td>
</tr>
<tr>
<td>Mothers’ age (year)</td>
<td>F</td>
<td>Sig</td>
<td>2.148</td>
<td>0.119</td>
<td>0.201</td>
<td>4.129</td>
</tr>
<tr>
<td>Duration of disease (month)</td>
<td>F</td>
<td>Sig</td>
<td>0.422</td>
<td>0.792</td>
<td>0.070</td>
<td>0.993</td>
</tr>
<tr>
<td>Child’s age (month)</td>
<td>F</td>
<td>Sig</td>
<td>0.769</td>
<td>0.465</td>
<td>0.800</td>
<td>0.142</td>
</tr>
<tr>
<td>Number of children</td>
<td>F</td>
<td>Sig</td>
<td>1.039</td>
<td>0.376</td>
<td>0.809</td>
<td>1.822</td>
</tr>
</tbody>
</table>
Discussion

Adaptation is not possible in the families with a cerebral palsy child without an efficient coping strategy. Since mothers are the main care givers in Iranian families [28], their point view was assessed in the present study.

The results indicated that mean score of family coping was 97.3, which is close to the score obtained for the mothers of autism children (95.5) [21]. Since the family coping score is comprised of five subscales and the three subscales of reframing, seeking spiritual support, and mobilizing family to acquire support and acceptance were measured by the present study and Twoy et al.’s study, the results of these two studies are comparable.

Additionally, the results indicated that reframing was the most commonly used strategy in families with cerebral palsy child; this result in consistent with Twoy et al. (2007), Kristic and Oros (2012), and Churchill et al., (2010)[14, 16, 21].

Lin (2000) showed that successful adaptation was significantly related to using reframing in the mothers of cerebral palsy child at school age [7]. Reframing helps the mothers in cognitive reformation of problems in painful and unpleasant situations so that such situations become more acceptable [14]. Apparently, the families had come to an understanding that the stressors were indispensable part of life and reframing enabled them to redefine the themes in a positive manner. Through this, they can find a solution to deal with the problems.

The study showed that the subscale social support was less frequently used by the families; so that the item No. 29 (I inform my neighbors about my problem; score = 2.02) and the item No. 8 (I accept my neighbors’ gifts and supports; score = 2.20) obtained the lowest scores. Ayrault (2001) showed that some their participants tended to keep their distance from their friends, neighbors, and relatives as the mothers were afraid that they might not understand specific needs of their children [29]. Twoy (2007) reported that the neighbors’ score was low and 68% of the participants tended to share their problems with their friends [21]. Lin (2000) reported that the item No.29 (mean score=3.29) and the item No. 8 (mean score = 3.33) obtained the highest scores [7]. In addition, Pritzlaff (2001) showed that gaining social support was a frequently used approach by the mothers [30]. Moawad (2012) maintained that following reframing and seeking social support was the mostly used approaches by the families from the mothers’ point of view. Given that seeking social support is defined in F-COPES with the elements friends, neighbors, and relatives’ support, the inconsistent findings by different studies can be explained by families’ different attitudes and cultural differences about disabilities. At any rate, there is a need for further studies on families’ attitudes and cultural differences as to disabilities and seeking social support.

Given the necessity of gaining social support, it seems that preventive plans need to be implemented for the families with cerebral palsy children and it is imperative to design interventions to support seeking social support in these families.

The results also showed that there was no significant relationship between family coping score based on demographical specifications except for mothers’ age. The results were consistent with the studies that showed there was no significant relationship between coping and education level [1, 21]. However, Kumar (2008) showed that the mothers with higher education level tended to have higher coping score [31].

Passive appraisal score of the mothers of children with gross motor function level of 4 and 5 was higher than that of the rest of participants. Since the higher motor problems mean that the child would have more problems, parents of such children tend to adopt passive appraisal approach as a passive approach.

Post hoc test (Tukey) showed that the mothers older than 40 years had more tendency to use passive appraisal; so that other aspect of life of these mother may change along with aging and lead to more tendency to passive appraisal. There is a need for further studies in this field.

As to higher mean score of family mobilization to seek support and acceptance, increase of duration of disease increases the necessity of seeking medical advices and to cover this need, families tend to consult with other families in similar situation, social institutes, and physicians. Twoy et al. (2007) showed that 93% of the participants sought
information from other families in similar condition [21]. It is notable that the score of the item No.4 ("asking for information from families in similar situation) was 4.10.

In terms of limitations of the present study, small study group and the fact that participants were selected only among the mothers who had referred to rehabilitation centers are notable. Therefore, the results cannot be generalized to other mothers with cerebral palsy children. Similar studies can be done on other family members such as siblings. Comparative studies on mother and fathers at different stage of development of the child with cerebral palsy is also recommended. A quantitative study may examined the different aspects of the phenomenon.

Conclusion

From mother’s perspective, different coping strategies are adopted to face the problems. Reframing was the most common strategy used by families. The results can be used by healthcare givers for implementing better support programs and improving coping skills of the parents and families. Without the support provided by healthcare givers, families might be led toward using improper coping method, which is not constructive for long/short-term adaptation to the disease of children. Moreover, psychological stresses of the caregivers of cerebral palsy children decrease the chance of finding a proper coping strategy.

Acknowledgement

The study was a part of a PhD dissertation on nursing in Shahid Beheshti University of Medical Science (Tehran, Iran). The authors wish to thank the officials of the Faculty of Nursing and Midwifery, Kermanshah Wellbeing Organization, and all the officials and personnel of Kermanshah-based rehabilitation centers. We also thank all the mothers who took part in the study.

References:

30. pritzlaff, A., Examine the coping strategies of the parents who have children with disabilities 2001, University of Wisconsin-Stout.
Assessment of musculoskeletal Disorders in Iranian dentists

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Authors’ Contribution: Safoura Ghodsi, Javad Vatani, Maryam ghaljahi, writing the first draft and contribution to final draft and analysis; Safoura Ghodsi, Javad Vatani; Maryam ghaljahi, design of study, collection of data, contribution to final draft; Safoura Ghodsi, Javad Vatani; Maryam Ghaljahi, collection of data, supervision of group, contribution to first draft, final draft and supervision on analysis of data. Funding/Support: This work was conducted with the support of Tehran University of Medical Sciences (Grant# 24827).

Abstract:

The major work–related disorders in workplaces are musculoskeletal disorders, which are the main reasons for workers’ disability. This study was performed to evaluate the prevalence of contributing factors to musculoskeletal pain in dentistry. A descriptive analytical study was conducted on 200 dentists in Tehran, Iran. Nordic standard questionnaire was used to collect data about musculoskeletal disorders via interview; Postural evaluation was performed by direct observation during work; photos were taken; videos were recorded; and REBA (Rapid Entire Body Assessment) was used for data collection. Ethics statement: the study was authorized to use human subjects by the university human research ethics committee (Irct ID: IRCT2014051117649N1).

The prevalence (95% confidence interval (CI)) of neck, shoulder, elbow, wrist, low back, and knee pains in the study sample were 22.0% (28.39 – 16.46), 25.5% (19.61 – 32.13 ), 8.5 (5.02 -13.26), 18.5 (13.37 – 24.59), 32.16 (25.72 – 38.60), and 32.5 (26.06 – 39.46), respectively. Based on multiple logistic regression results, the relationship between occurrence of musculoskeletal disorders in different parts of body and ergonomic factors such as working hours, height, work precedent, and demographic factors such as age, sex, marital status, and education was significant (P value≤0.05). Postural evaluation during work using REBA, indicated high risk of musculoskeletal disorders for the dentists. Most of the determinants of musculoskeletal pain including being forced to work, job dissatisfaction, and body posture during work can be controlled. Therefore, the managers and decision makers’ attention in improving the quality of working conditions is important along with specific occupational health education.

Keywords: Musculoskeletal pain, Nordic Questioner, Ergonomic, REBA Method

Introduction

High prevalence rates of work-related musculoskeletal disorders (WRMSDs) among dentists have been reported [1-8]. Dentists are at high risk of musculoskeletal disorders [MSD]. WMSDs are of the leading causes of disability and discomfort in dentists [9-14].

In general, Pain in dentists were associated with the following characteristics: awkward posture, and excessive tightening of the back during work; and the application of vibrating tools and equipment not designed ergonomically [4]. The musculoskeletal disorders that are on the rise worldwide has numerous repercussions from serious ill-health effects at quality of life [9]. A poor ergonomic posture could make the dental students get habituated to the wrong working style which might lead to MSDs [10]. Professional Hazards are becoming an impending health problem in various specialties and dentists are no exception according to the nature of the stressful work they perform. Dentists are constantly exposed to a number of specific occupational hazards, which develop and intensify with years [8]. Musculoskeletal pain and injury (most often in the back, neck, shoulders, hands, wrists, and thumbs) are associated with minute and repetitive strains during work [11].
The common painful areas of the body were reported as follows: neck (43.4%), back (35.8%), and shoulder and wrist (each 25%). A relatively high prevalence of musculoskeletal pain has been revealed among dentists.

Dantas reported that the highest prevalence of complaints was related to the lower back (58.4%) and the lowest prevalence was found in the elbow (10.3%).

In another study, 62% of dentists had at least one musculoskeletal complaint, 30% reported chronic complaints, 16% had spells of absence and, 32% sought medical care.

In Kurşun study the prevalence of musculoskeletal pain was 49% in postgraduate dental students. The lower back was found to be the most commonly affected area (34%).

The mentioned results reemphasize the need for ergonomic preventive cares in dentistry and the importance of training on ergonomic principles from the beginning of the clinical course. Furthermore, special attention should be paid to the design of working environment based on ergonomic principles.

Despite many studies on musculoskeletal disorders, there is still no clear and scientific method to evaluate risk factors of musculoskeletal disorders with REBA Method, and the ones available have some defects. The ultimate aim of the present study is to provide a new method to assess risk factors of musculoskeletal disorders in various phases of dental practice of 1) oral implantology and endodontics, 2) oral and maxillofacial surgery, 3) orthodontics and dentofacial orthopedics, 4) pedodontics, and 5) periodontics.

**Materials and Methods**

The present study is a descriptive analytical study on 200 dentists during dental practice in Tehran, Iran in 2015.

**Data collection**

Demographic/occupational and Nordic standard questionnaires were employed for data collection. Demographic questions consisted of age, marital status, number of children, working hours per week, work history, lifting 25 kilograms or more per day, working with hands above shoulder level, repetitive movements of wrist and fingers, rewards, staff and managers’ support, job satisfaction, and perceived occupational safety information; the Nordic standard questionnaire related to back, neck, shoulder, elbow, and wrist pains.

**Working position**

200 dentists were randomly selected and their posture during work was evaluated via observation, taking photo, recording video, and REBA (Rapid Entire Body Assessment).

Dentistry profession was divided into five tasks: oral implantology and endodontics, oral and maxillofacial surgery, orthodontics and dentofacial orthopedics, pedodontics, and Periodontics. Afterward, the risk level of each task was calculated using REBA software. This is one of the most recent techniques of analysis the body position during work to evaluate possible risks of MSDs. REBA is one of the observational methods in postural evaluation. This method, a quick way to evaluate body posture within a short time, was first introduced in 1995 by Lynn Mac Atamny and Hygnt.

**REBA procedure**

In this procedure, different parts of the body are divided into two groups, A and B for analysis:

A) Trunk, neck, and feet postures consist of 60 combined postures.

B) Arms, forearms, and wrists postures consist of 36 combined postures.

Considering factors such as range and direction of joint motion, rate of force exertion, the tool gripping mode and activity, and the score of each limb was calculated. In the next stage, the total score was estimated using specific REBA tables. The final score represented the potential exposure to MSDs. The validity and reliability of the instrument are confirmed in numerous studies.

**Ethics statement.**

This trial was registered in Iranian Registry of Clinical Trials (Irct ID: IRCT2014051117649N1). The study was authorized to use human subjects by the university human research ethics committee.

**Statistical analysis**

Chi-square and multiple logistic regression analysis were used for data analysis.

**Results and Discussion**

Subjects’ average age was 31.38 ± 9.54 years with a range of 15-67 years. 78% of the subjects were male and 22% female. In terms of marital status, 62% were married, 37% single, and 1% were widows. Average height of the subjects was 170.23 ± 8.68 cm, and 45.5% of the subjects had a family history of MSDs.
Table 1: Distribution of samples according to risk factor experience in an average working day

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Numbers</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive movements of wrist or fingers more than 4 hours</td>
<td>182</td>
<td>91%</td>
</tr>
<tr>
<td>Repetitive Flexion and Extension of elbow for more than 1 hour</td>
<td>182</td>
<td>91%</td>
</tr>
<tr>
<td>Working with hand above shoulder level for more than 1 hour</td>
<td>55</td>
<td>27.5%</td>
</tr>
<tr>
<td>Carrying 25 kg or more load by hand</td>
<td>36</td>
<td>18%</td>
</tr>
<tr>
<td>Go up or down stairs for more than 30 steps per day</td>
<td>43</td>
<td>21.5%</td>
</tr>
<tr>
<td>Kneeling or squatting or bending for more than 1 hour</td>
<td>120</td>
<td>60%</td>
</tr>
<tr>
<td>Payments to employees based on the number of tasks/products</td>
<td>150</td>
<td>75.8%</td>
</tr>
<tr>
<td>Determined amount of the daily work of employees</td>
<td>91</td>
<td>45.7%</td>
</tr>
<tr>
<td>Reward payment for working more than the agreed amount</td>
<td>64</td>
<td>32.3%</td>
</tr>
<tr>
<td>Being under pressure for doing work in specified time</td>
<td>68</td>
<td>34%</td>
</tr>
<tr>
<td>Being self-employed</td>
<td>59</td>
<td>29.6%</td>
</tr>
</tbody>
</table>

Table 1 shows the distribution of the samples according to risk factor experience in an average day. Based on these data, the most common risk factors in samples were repetitive movements of the wrist or fingers for over 4 hours and repeated flexion and extension of elbow for more than 1 hour.

The prevalence (95% CIs) of neck, shoulder, elbow, wrist, low back, and knee pain in the study sample was 22.0% (28.39 – 16.46), 25.5 (19.61 – 32.13 ), 8.5 (5.02 - 13.26), 18.5 (13.37 – 24.59), 32.16 (25.72 – 38.60), and 32.5 (26.06 – 39.46) respectively. Knee pain was the most common MSD in samples. The results of multivariate logistic regression of factors associated with musculoskeletal pain are given in Table 2.
## Table 2: Results of multivariate logistic regression of factors associated with musculoskeletal pain

<table>
<thead>
<tr>
<th>Limb</th>
<th>Factors</th>
<th>Odds ratio</th>
<th>95% CIs</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>Family history of musculoskeletal pain</td>
<td>2.59</td>
<td>1.23-5.47</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Being under pressure for doing work at specified time</td>
<td>3.92</td>
<td>1.80-8.53</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Reward payment for working more than the amount that was agreed</td>
<td>0.47</td>
<td>0.21-1.07</td>
<td>0.700</td>
</tr>
<tr>
<td>Shoulder</td>
<td>Back pain</td>
<td>5.18</td>
<td>3.59-42.35</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Neck pain</td>
<td>16.40</td>
<td>2.22-12.12</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Being left-handed</td>
<td>0.083</td>
<td>0.010-0.83</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>Proportion of money received with the type of activity</td>
<td>0.34</td>
<td>0.13-0.87</td>
<td>0.027</td>
</tr>
<tr>
<td>Elbow</td>
<td>Being self – employed</td>
<td>10.98</td>
<td>1.76-68.74</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Shoulder pain</td>
<td>20.99</td>
<td>2.53-173.30</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Wrist pain</td>
<td>26.80</td>
<td>4.44-161.22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Being left handed</td>
<td>29.08</td>
<td>1.75-483.44</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>Repetitive movements of wrist or fingers for more than 4 hours</td>
<td>0.03</td>
<td>0.002-0.43</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>1.13</td>
<td>1.03-1.23</td>
<td>0.008</td>
</tr>
<tr>
<td>Wrist pain</td>
<td>Shoulder pain</td>
<td>3.124</td>
<td>1.35-7.226</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>Elbow pain</td>
<td>9.097</td>
<td>2.76-29.96</td>
<td>0.000</td>
</tr>
<tr>
<td>Back pain</td>
<td>Sex</td>
<td>2.861</td>
<td>1.29-6.30</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>Family history of musculoskeletal pain</td>
<td>4.02</td>
<td>1.29-6.30</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Being under pressure for doing work at specified time</td>
<td>2.54</td>
<td>1.22-5.30</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Working time per week</td>
<td>0.978</td>
<td>0.96-0.994</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Lack of job security</td>
<td>0.499</td>
<td>0.37-14.73</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Reward payment for working more than the amount that was agreed</td>
<td>0.44</td>
<td>0.19-1.004</td>
<td>0.051</td>
</tr>
<tr>
<td>Knee pain</td>
<td>Marital status</td>
<td>4.086</td>
<td>1.67-9.98</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>0.477</td>
<td>0.22-0.903</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>Working time per week</td>
<td>0.962</td>
<td>0.92-0.999</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>Working time per day</td>
<td>1.678</td>
<td>1.21-2.314</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Working with hand higher than shoulder level for more than 1 hour</td>
<td>0.207</td>
<td>0.045-0.950</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>Kneeling or squatting for more than 1 hour in a day</td>
<td>2.784</td>
<td>1.24-6.222</td>
<td>0.013</td>
</tr>
<tr>
<td>Decision making about how to do the work</td>
<td>Often</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Some times</td>
<td>0.059</td>
<td>0.004-0.815</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>seldom</td>
<td>0.121</td>
<td>0.009-0.815</td>
<td>0.098</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>0.831</td>
<td>0.016-42.17</td>
<td>0.926</td>
</tr>
<tr>
<td>Decision making about type of the work</td>
<td>Often</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Some times</td>
<td>25.15</td>
<td>0.016-42.17</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>Seldom</td>
<td>36.87</td>
<td>2.87-473.03</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>2.207</td>
<td>0.045-0.950</td>
<td>0.561</td>
</tr>
</tbody>
</table>
This table shows the factors significantly correlated with pain in the neck, and includes family history of musculoskeletal pain, pressure to do the job at a specified time, and getting reward for doing extra work. The first two variables were directly related to the risk of neck pain, but the third variable was reversely related.

The correlation between back pain, neck pain, being left-handed, and the balance between income and type of activity with shoulder pain was statistically significant. Back and neck pain increased the occurrence of shoulder pain, but the other two variables reduced it.

The correlation between self-employment, shoulder pain, wrist pain, being left-handed, repetitive movements of the wrist or fingers for more than 4 hours, and age with elbow pain was statistically significant. Among different variables, the correlation between shoulder and elbow pain with wrist pain was significant.

The correlation between gender, family history of musculoskeletal pain, being pressured to do the job at the specified time, working hours per week, lack of occupational safety, and getting reward for doing extra work was significant with back pain. Among these variables, the last factor reduced the occurrence of back pain significantly.

The correlation between marital status, education, working hours per week and per day, being left-handed, kneeling or squatting more than an hour during the day, the decision on how to perform work, and making decisions about the type of work was statistically significant with knee pain.

### Table 3: The results of evaluating working posture in dentists using REBA method

<table>
<thead>
<tr>
<th>Task</th>
<th>Right limb</th>
<th>Left limb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danger level</td>
<td>Requirement of practical action</td>
</tr>
<tr>
<td>Oral Implantology and Endodontics</td>
<td>Very high</td>
<td>Is required quickly</td>
</tr>
<tr>
<td>Oral and maxillofacial surgery</td>
<td>Very high</td>
<td>Is required quickly</td>
</tr>
<tr>
<td>Orthodontics and dentofacial orthopedics</td>
<td>Very high</td>
<td>Is required quickly</td>
</tr>
<tr>
<td>Pedodontics</td>
<td>Very high</td>
<td>Is required quickly</td>
</tr>
<tr>
<td>Periodontics</td>
<td>High</td>
<td>Is required as soon as possible</td>
</tr>
</tbody>
</table>

Evaluation of working posture in dentistry using REBA (Table 3) showed that oral implantology and endodontics, oral and maxillofacial surgery, orthodontics and dentofacial orthopedics, pedodontics and periodontics had very high scores of working position, and risk of MSDs in the right and left limbs of workers in these tasks was too high. Furthermore, the risk of MSDs in all dentistry fields was high, and the score of working position in this task, was high based on REBA. These results show that working posture has to improve.

The study Rabiei [3], Dantas [4], Cherniack [5], and Alexopoulos [6] showed that high prevalence of MSDs in dentists was related to time-worn, low rest, static working pressure, and repetitive movements. This findings are in agreement with the present study.

The present study showed that knee pain and back pain (trunk) were the most common musculoskeletal pains among dentists. Åkesson [7], Sakzewski [9], Dable [10] studies showed that the most common MSDs in Dentistry were in the trunk, neck, and shoulders that is in agreement with a part of the present study’s results. But, it does not approve Kumar [12] that found a high prevalence of neck and shoulder pain in dentists. Harvin [11] suggested that MSDs were resulted from improper work station design which is consistent with the present study’s results.

Thanathornwong BS. [13], Kozak AS. [14], Kurşun ŞE. [15] Suggested a strong relationship between musculoskeletal pain (e.g. neck and shoulder pain) and stress in workplace that is resulted from being under pressure to do the work and lack of security in work. These studies confirmed the present study’s results. Evaluation of working position using REBA showed that dentistry had a very high score in 1. Oral Implantology and endodontics, 2. Oral and maxillofacial surgery, 3. Orthodontics and dentofacial orthopedics, 4. Pedodontics for MSDs. This result confirms Bennadi DK. [8] study who
declared MSDs have a high prevalence in some works like Dentistry.

Several studies have been done on different industries employees to assess MSDs prevalence and management such as the study by Sadeghian [1] on Clinical Laboratory Workers and Oakmana [17], on non-nursing health care sector employees.

The present study suggests further epidemiological studies with the aim of modifying work stations and work time of dentists to reduce pressure on body limbs. Furthermore, it proposes ergonomic training with the aim of improving the existing situation and eliminating the static working status to reduce MSDs. The same suggestion is also emphasized by other researchers such as Gupta [18] and Valachi [19]. The present study suggests further Evaluation economic of ergonomics studies with the aim of modifying work stations and reduce MSDs prevalence and control accident at work (20-21).

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Reference:

The Effect of Levothyroxine on Memory Impairment Induced by Electroconvulsive Therapy in Bipolar Patients: Clinical Trial

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Abstract

Introduction: Electric convulsive therapy (ECT) is an effective and fast acting treatment for bipolar disorder particularly in acute cases. Considering the cognitive problems and especially memory deficits after the use of electroconvulsive therapy, some patients refuse to accept it. This study aimed to investigate the effect of levothyroxine on memory impairment induced by electroconvulsive therapy in bipolar patients.

Materials and Methods: This study was a clinical trial. The population study included patients with bipolar disorder treated with ECT admitted to 22 Bahman hospital in Qazvin that among them taking into account the criteria for inclusion and exclusion, 26 patients were recruited and randomly were assigned into two groups: placebo and levothyroxine. The study tools included Mini-Mental State Examination (MMSE) and the Wechsler Memory Scale which before and after the intervention were completed by the subjects. Data were analyzed by paired t-test and independent t.

Results: The results showed that in the group who received levothyroxine in the orientation subscale (p<0.002) and the memory total score (p<0.035) in the post-test compared pre-test there was a significant increase. In addition, the comparison of scores between the two groups showed that in the group who received levothyroxine compared with placebo in the orientation subscale (p<0.041) and the memory total score (p<0.036) there was a significant difference.

Conclusion: Considering the results of this study, which shows the effectiveness of levothyroxine on total memory performance and orientation of patients with bipolar disorder who has received ECT, this drug can be used during sessions of ECT to prevent the creation of some memory problems in these patients.

Keywords bipolar disorder, electroconvulsive therapy, ECT, levothyroxine

Introduction

Mood disorder includes disturbance in emotional or mood state. People can experience this distress as severe depression, extreme joy or a combination of these emotional states (Oltmanns and Emery, 2012, Association, 2013). A highly debilitating disorder, complex and chronic in psychiatry which placed in the mood is bipolar disorder (Mathews and Barch, 2006). Bipolar disorder (BD) is classified in disorders with the highest level of disability in worldwide (Bowie et al., 2010) and can affect almost all age groups (Frangou et al., 2017). This disorder includes depression and mania symptoms and according to the severity of symptoms is divided two types of bipolar disorder type I and bipolar disorder type II. According to studies, this disorder affects on average 1 percent of the general population and compared with other mood disorders followed by less improvement and more mortality rates (Goodwin et al., 2003). Given the devastating symptoms of this disease and the severe effects on the lives of patients and their family, many treatment options for bipolar disorder has been designed and implemented that one of them is electroconvulsive therapy (ECT) (Milev, 2017, Perugi et al., 2017).

Electroconvulsive therapy (ECT) which sometimes referred to as shock therapy, usually run conducted for six to twelve sessions for two to four weeks. In most cases of this treatment to reduce the possibility of injury to the patient, muscle relaxant drug or anesthetic is used (Kearne and Trull, 2012). Several studies have shown that electroconvulsive therapy in life-threatening conditions in mood disorders such as depression and bipolar disorder is
very effective and has rapid effect. So in some bipolar patients with threatening, risky or problematic behaviors or their lives are in danger as a result of an acute attack, using this method causing a rapid reduction of patient's symptoms is essential. Despite outstanding therapeutic effects of this method, some of the problems associated with it, including convulsion duration and its effect on memory as well as effects on brain physiology caused caution in using it (Prapotnik et al., 2006).

The most common side effects associated with ECT is memory loss (Kalat, 2009) that has been mentioned in many studies. For example, in one study it was found that four weeks after completion of treatment in both groups of patients who one group had received electroconvulsive therapy and the other group received dummy electroconvulsive therapy, the electroconvulsive therapy group showed more weakness in memory performance (Scott, 2005). In another study the effects of electroconvulsive therapy on cognitive functions of patients with three disorders of depression, mania and schizophrenia was evaluated and the results showed that memory loss after treatment is observed in patients of all three groups, but after one month, this memory loss has an improve process (Vafaee and Ghadimi, 2005).

According to cognitive problems and especially memory deficits after the use of electroconvulsive therapy, some patients refuse to accept it. So if using drug or non-drug methods, some part of the patient's memory problems resolved after using this treatment, it can be use more when necessary. Among drugs that can be effective to reduce memory problems induced by this treatment are Thyroid hormones such as levothyroxine. In various studies it has been found that levothyroxine and liothyronine plays a role in reducing cognitive problems such as memory in different patients (Krausz et al., 2004, Tan et al., 2008). It also has other advantages that its use is justified. For example, Bauer and his colleagues found in their study that the use of levothyroxine has significant role in reducing depressive symptoms in patients with bipolar disorder is (Bauer et al., 2016).

According to what was said, it seems if using an appropriate method, the memory problems after therapy is reduced, steps can be taken to more use of this treatment. On the other hand the initial studies indicate the effects of levothyroxine on cognitive functions. It also has other beneficial effects such as reducing symptoms of depression and is more available in our pharmaceutical market and having more half-life by administering one time reaches a more constant plasma level. Considering all of these cases and the lack of adequate research in this field, this study aimed to investigate the effect of levothyroxine on memory impairment induced by electroconvulsive therapy in bipolar patients.

Materials and Methods

The research method, population and sample

This study was a clinical trial. The study population consisted of patients with bipolar disorder treated with ECT who were admitted to 22 Bahman hospital in Qazvin. The subjects were selected using convenience sampling and according to the criteria of inclusion and exclusion criteria. Inclusion criteria were: 1) Diagnosis of bipolar disorder based on interviews by the psychiatrist; 2) indication for treatment with ECT, according to experts in psychiatry; 3) age between 18 and 65 years; 4) informed consent from the patient's head. The exclusion criteria were as follows: 1) the existence of any contraindications of levothyroxine; 2) organic disease of the brain and mental retardation (based on history, physical examination and medical records) or any cognitive impairment (MMSE <= 22) at baseline; 3) ECT less than 6 sessions 4) delirium caused by ECT; 5) not receiving at least one of the standard stabilizers (sodium valproate, carbamazepine or lithium); 6) receiving more than one standard stabilizers drug (of sodium valproate, carbamazepine or lithium); 7) receiving one shock in more than half of the sessions; 8) convulsions <25 seconds in more than half of the sessions; 9) convulsions > 3 minutes even in one session. Given that phase of bipolar disorder (in terms of mania, depression or mixed) may interfere in cognitive and memory state in patients, to control of this potentially confounding variable, all patients were selected in the acute phase of mania.

Considering these criteria, 26 subjects were randomly divided into two groups: placebo and intervention. The two groups in terms of memory status basis (based on the scores of the Wechsler Memory Scale), the manic phase / depression, type and dose of mood-stabilizing medications (sodium valproate, carbamazepine or lithium), presence or absence of first generation antipsychotic medication, presence or absence of second-generation antipsychotic medications, presence or absence of anticholinergic drugs (Bipyridine or trihexyphenidyl), presence or absence of benzodiazepines, presence or absence of antidepressants were measured. Then, the day before the start of the first session of ECT until the last day of ECT sessions, the intervention group received 0.1 mg oral levothyroxine tablets (given the minimum effective amount in the depression and mania) and the control group were given placebo (in
days patients received ECT the drug is given after receiving ECT treatment sessions, and in the days that the patient hadn’t received ECT, the drug was giving in fasting mode. Levothyroxine manufactured by Iran hormone and placebo was inert starch and to remove the psychological impact (suggestive), levothyroxine, and to create equal conditions for assessing the effectiveness, the levothyroxine had been poured in capsules (both drug and placebo both in capsules spilled) and duration of drug or placebo use considering a difference in the treatment period of patients with electroconvulsive was varied, lasted from 2 to 4 weeks. After 2 weeks of completed ECT sessions, again the memory of all patients with Wechsler memory Scale was evaluated and at the end, in addition to comparing this test’s scores between the two groups, the Memory loss in each group during treatment with ECT was determined and using appropriate statistical methods was compared.

Method of treatment and prescribing medication and placebo

ECT process was in a way that the first session of ECT, an electric shock with an intensity of 250-200 J was applied and acceptable time of convulsion was 25 seconds to 3 minutes. In all sessions of the ECT, if a seizure lasted less than 25 seconds, was deemed ineffective and wasn’t accounted in the number of ECT sessions and at the same session, the electric shock again with an intensity of at least higher 100 joules was repeated only once. Program was such a way that if the term of convulsion in patients lasted more than 3 minutes, the patient was referred to a neurologist for evaluation that the patients in our study, this was not the case. ECT type had been scheduled as single or double-sided (Bitemporal) and number of sessions were three times a week.

Research Tools

Mini-Mental State Examination (MMSE): mini mental state examination was designed in 1975, by Folsthine et al. Mini mental state examination is the most common screening tool for cognitive disorders in the world and has been translated in different languages translated and standardized in different cultures. This test assesses different cognitive functions and provides an overall assessment of the cognitive situation of subjects. Performing this test usually takes ten minutes (Foroughan et al., 2008). This test, which includes questions to assess orientation, immediate and close memory, naming, reading and writing ability, attention (concentration), executive and visual-spatial function, is scored in the range from 0 to 30 that according to standardization carried out on the Persian version, the cutoff point of 22 to down, is considered as cognitive impairment and in the study conducted by Seyedian and colleagues, this cutoff point has the sensitivity of 90% and specificity of 93.5 percent (Seyedian et al., 2008).

Wechsler Memory Scale: Wechsler Memory Scale was designed in 1970 by Wechsler. Wechsler Memory Scale-revised has 7 subscales (awareness, orientation, mental control, visual memory, logical memory, association and repeat) that evaluate different aspects of memory. Iranian version of the Wechsler Memory Scale-revised in Iran and Shiraz for people 16 to 64 years old has been standardized and confirmed; in this study retest coefficients for subscales and compounds have been reported 0.28 to 0.98. Comparing the mean raw scores of two groups of clinical and normal subjects to determine the validity of the Revised Wechsler Memory Scale showed that the mean raw scores in clinical groups were significantly lower than the mean raw scores in normal group, therefore, this acceptable scale can be used (Orangi et al., 2002).

Results

All statistical analyzes were performed with SPSS software version 20. For comparing the pre-test and post-test in each group, paired t test and to compare scores between the placebo and levothyroxine group independent t-test was used. In this study, 48 participants were present. The mean age of subjects in the placebo group was 36.26 with a standard deviation of 13.3 and the mean age of levothyroxine group was 40.1 with a standard deviation of 7.70. As well as information related other demographic variables in both the placebo group and levothyroxine are shown in Table 1.
### Table 1: Demographic information of placebo group and levothyroxine group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Placebo</th>
<th></th>
<th>levothyroxine</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
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<tr>
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<td>8</td>
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<td>2</td>
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<td>0</td>
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<tr>
<td>Master</td>
<td>1</td>
<td>3.75</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
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<td></td>
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<tr>
<td>Male</td>
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<td>64.3</td>
<td>5</td>
<td>21</td>
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<td>Female</td>
<td>17</td>
<td>47.2</td>
<td>19</td>
<td>79</td>
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<td>Marital Status</td>
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<td></td>
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<td>37.5</td>
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<td></td>
</tr>
<tr>
<td>City</td>
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<td>18</td>
<td>75</td>
</tr>
<tr>
<td>Village</td>
<td>5</td>
<td>19</td>
<td>6</td>
<td>25</td>
</tr>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>15</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>No</td>
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<td>85</td>
<td>21</td>
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<td></td>
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<td>35</td>
<td>7</td>
<td>29</td>
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<td>65</td>
<td>17</td>
<td>71</td>
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<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>100</td>
<td>22</td>
<td>92</td>
</tr>
</tbody>
</table>
For comparing the pre-test and post-test scores of placebo group and levothyroxine group, paired t-test was used and the results are shown in Table 2.

Table 2 Paired t test to compare the scores of pre-test and post-test of two groups of placebo and levothyroxine

<table>
<thead>
<tr>
<th>Group</th>
<th>Variables</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>t</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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<tr>
<td>Placebo</td>
<td>Orientation</td>
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<td>0.59</td>
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<td>Knowledge</td>
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<td>5.76</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>Visual memory</td>
<td>9.30</td>
<td>1.69</td>
<td>9.11</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td>Logical memory</td>
<td>13.19</td>
<td>12.65</td>
<td>3.18</td>
<td>3.13</td>
</tr>
<tr>
<td></td>
<td>Attention and Concentration</td>
<td>7.65</td>
<td>1.12</td>
<td>7.61</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>Association</td>
<td>15.26</td>
<td>15.15</td>
<td>1.75</td>
<td>1.71</td>
</tr>
<tr>
<td></td>
<td>Repeat</td>
<td>4.50</td>
<td>1.06</td>
<td>4.26</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td>Total memory</td>
<td>97.12</td>
<td>10.81</td>
<td>19.97</td>
<td>9.08</td>
</tr>
<tr>
<td>levothyroxine</td>
<td>Orientation</td>
<td>4.70</td>
<td>0.62</td>
<td>5.25</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>Knowledge</td>
<td>5.66</td>
<td>0.63</td>
<td>5.87</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Visual memory</td>
<td>9.41</td>
<td>2.44</td>
<td>9.91</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td>Logical memory</td>
<td>12.20</td>
<td>12.58</td>
<td>3.92</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td>Attention and Concentration</td>
<td>7.75</td>
<td>1.11</td>
<td>7.95</td>
<td>0.80</td>
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<tr>
<td></td>
<td>Association</td>
<td>15.04</td>
<td>14.95</td>
<td>2.09</td>
<td>2.42</td>
</tr>
<tr>
<td></td>
<td>Repeat</td>
<td>4.37</td>
<td>0.71</td>
<td>4.54</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Total memory</td>
<td>96.16</td>
<td>11.62</td>
<td>99.08</td>
<td>11.27</td>
</tr>
</tbody>
</table>

As the above table can be seen in the placebo group in no subscale and the total score a significant difference in pre-test and post-test was seen, but in levothyroxine group orientation score from 4.70 in the pre-test has increased to 5.25 in post-test and this increase is statistically significant (p<0.002).

In addition, in this group the total memory from 96.16 in the pre-test has increased to 99.08 in the post-test that is statistically significant (p<0.035).

To compare the scores of placebo and intervention groups, firstly the pre-test score was subtract from post-test score to scores difference is obtained. After that, obtained scores in the two groups were compared by independent t test and the results are in Table 3.
As seen in Table 3, in the orientation variable score of placebo group 0.115 and score of levothyroxine group 0.541 has increased and there is a significant difference between the two groups (p<0.41). Also, in the total memory score has decreased in the placebo group, but the levothyroxine group score has increased that this difference was also significant (p<0.035). There was no significant difference in other memory subscales.

Discussion and conclusion

One of effective treatment for bipolar disorder is the use of electroconvulsion. However, because of side-effects of this method, especially loss of memory, using methods that prevent memory problems after electroconvulsive therapy is necessary. This study also aimed to investigate the effect of levothyroxine on memory impairment induced by electroconvulsive therapy in bipolar patients.

The results obtained in this study showed that the orientation subscale and the total memory score, in the intervention group had greater improvement in posttest than pretest. In addition, the comparison of the two groups of intervention and control also indicated that in the orientation subscale and the total memory score, the intervention group had greater improvement in memory performance in posttest. These findings indicate the efficacy of levothyroxine on some aspects of memory in patients who use electroconvulsive therapy.

In relation to the effect of levothyroxine on memory in bipolar patients who have received electroconvulsive therapy, no research was found, but similar results have been obtained in other studies. For example, in a study on the effectiveness of treatment with levothyroxine on memory quotient in adult patients (subclinical cases) with hypothyroidism, the results indicated that after treatment with levothyroxine memory quotient in the intervention group increased (Malek et al., 2012). In another study conducted in Brazil and on mice, the results showed that levothyroxine play a role in improving cognitive functions such as memory in mice (Reis-Lunardelli et al., 2007). Similar results suggesting the effect of levothyroxine on memory in other research also have been obtained (Sangün et al., 2015, Krausz et al., 2004, Tan et al., 2008).

In some studies, the effectiveness of other thyroid drugs on memory has been examined. Masoudzadeh and colleagues to investigate the effect of liothyronine administration on the cognitive impairment induced by ECT assigned 30 patients with major depressive disorder who were candidates for receiving ECT randomly divided into two groups of liothyronine and placebo. Participants in the liothyronine group received a dose of 50 micrograms per day for the entire period of receiving ECT (starting from the day before ECT), while the other group received placebo and revised Wechsler Memory Scale, to assess patients’ memory before the first session of ECT and after the sixth session was used. The results showed that after the sixth session of ECT, participants who had received
liothyronine obtained higher scores on Wechsler Memory test (Masoudzadeh et al., 2013). In another study conducted by Hamidiya Ghadirr and Afkhamz Ebrahimi, the effectiveness of using vitamin B12 and liothyronine on memory impairment after ECT in depressed patients was studied. In this clinical trial, 40 women who were nominated for ECT were divided randomly into two groups of intervention and control. The study results showed that liothyronine could prevent memory loss after ECT, while in the group that had received vitamin B12 similar findings weren’t observed (Hamidia et al., 2006).

About the reason for the effectiveness of levothyroxine and other thyroid drugs on memory function several hypotheses have been proposed. Based one of these hypotheses, the reduction of T4 reduces nervous actin polymerization. So it is possible that patients who receive liothyronine and T3 amount of their body is decreased, a temporary disruption happen in cytoskeleton actin that this turmoil in neurons of the amygdala and hippocampus, which are very sensitive to convulsion and have important role in memory and learning. maintain cells from the ravages of convulsions (Hamidia et al., 2006). In addition, anti-convulsant effect of thyrotropin releasing hormone (TRH) by co-administering of thyroid exogenous (liothyronine) hormones is reduced and this may decrease the needed ECT dose and thus reducing damage and its adverse cognitive (Seyedian et al., 2008).

The results of this study showed that levothyroxine effects on overall memory function and orientation of bipolar patients who received ECT disorder. In other words, levothyroxine prescription during sessions of ECT in patients with bipolar enhanced the total memory and orientation in them. The findings of this study, support the positive effect on cognitive impairment including memory impairment due to levothyroxine drug on cognitive impairments, specially memory loss induced by ECT in bipolar patients.

This study had some limitations. One limitation of this study was that some potential confounding factors such as "the severity of disorder" wasn’t examined. In addition this study has been conducted on a homogeneous sample (bipolar disorder patients) and the study on the different samples that aren’t limited to bipolar patients also seems necessary. Moreover, in the present study the convulsion (seizure) threshold in calculating the amount of effective electrical charge ECT was not evaluated. Therefore, it is recommended that research be done regarding these limitations. Also according to the results of this study, the practical recommendation that can be made is that levothyroxine in patients who received electrical convulsion is applied to reduce the effects of this method on memory.

Ethical considerations

This study has been registered in the database of clinical trial with IRCT2015071012018N3 Code and Ethics Committee approval of Qazvin University of Medical Sciences with IR.QUMS.REC.1394.202 code has been received. For ethical considerations of confidentiality of data (information) were explained to the participants and written informed consent was obtained from parents (guardian) of studied patients (consent form is attached). If the individual did not have the ability to read, the consent form was read by researchers to him, and in the case of consent, his/her signature or fingerprint was taken. The participants were empowered at every stage of research without having to appeal to reason, exclude from study. Additionally, ethical principles in using other sources were respected, and in the case of using research results of other scientists, the sources have been noted.

References


20. SANGUN, Ö., DEMIRICI, S., DUNDAR, N., PIRGON, Ö., KOCA, T., DOĞAN, M. & DUNDAR, B. 2015. The Effects of Six-Month L-Thyroxine Treatment on Cognitive Functions and Event-Related Brain Potentials in Children with


“A Chance for a better life”: A thematic content analysis of the reason for decision to perform face cosmetic surgery from the perspective of Iranian men and women

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Abstract

Background: Currently, becoming beautiful is a value in Iranian society. Although experts have suggested several complications of cosmetic surgery but decision to have these surgeries has been dramatically increased in recent years, which has imposed high workload and costs on the health care system. The aim of this study was to explore the reasons why people perform cosmetic surgery in an Iranian context.

Methods: Twenty-one (21) male and female who were 52-22 year-old and had undergone face plastic surgery between 1-5 years ago were selected by purposeful sampling and semi-structured data was collected via open interviews, while qualitative content were analyzed utilizing conventional analysis methods.

Results: Data analysis revealed the theme "A chance for a better life" which contains 2 subcategories of "Gaining social opportunities" and "Gaining the approval and acceptance in society".

Conclusion: The results revealed that participants consider cosmetic surgery as a blessing from God that plays a major role in their future and so they have accepted the risks of the surgery. Therefore, health care providers, particularly nurses can consult them through education before doing cosmetic surgery in order to help individuals make right decisions.

Keywords: decision, cosmetic surgery, qualitative research, content analysis, Iran

Introduction

One of the essential needs of man in modern times is "being seen beautiful" (1). Modern society has determined a high competitive standard for beauty (2). Therefore, becoming beautiful based on defined standards can frustrate people who are not beautiful (1). So, changes in the modern society have caused people to draw more attention to their bodies and how to manage and control it in the modern consumer society. One of the behaviors observed in most societies is cosmetic surgery (3).

Accordingly, the willingness of men and women who are interested in having cosmetic surgery has increased dramatically (4). Cosmetic surgery is a surgical procedure with the aim of improving the appearance by increasing physical features (5). According to the reports of the American Society of Plastic Surgeons, cosmetic surgical procedures in the United States have been increased to 98% from 2000 to 2012 while 72% of these surgeries have been performed because of beauty and to improve the appearance and increase self-confidence (6).
At the moment, becoming beautiful is a value for the current Iranian society that has accelerated competition for becoming beautiful (1). According to global studies on cosmetic surgery, Iran is the country with the highest rate of cosmetic procedures, as reportedly, in terms of the ratio of people who carried out cosmetic surgeries rather than the whole population. In 2013, Iran was ranked first in the world, while more than 175,000 surgical and non-surgery operation have been carried out in Iran (7). In today's society of Iran, women give more importance to beauty, although many men may attempt to perform cosmetic surgery in order to improve their appearance (1).

Researchers have shown that there are two types of motivation why people perform cosmetic surgeries: Social and intrapersonal factors (8). Some studies have revealed that intrapersonal factors such as self-assessment, attractiveness (9, 10), appearance-based rejection sensitivity (11, 12) and negative body image (13, 14, 15, 16) are the primary stimulants for cosmetic surgery. Socio-cultural factors can also increase their interest in cosmetic surgery, because people are increasingly exposed to cosmetic surgery via social networks (17, 18, 19, 16, 20).

Not only media but also parents and friends may also transfer messages about the importance of physical appearance and the applied strategies for increasing the attractiveness (17, 21). These external and internal pressures which are due to the physical appearance and body image lead to feelings of inadequacy and anxiety in women (22, 23). Women are more concerned about how other people in the community may judge them based on their physical appearance (2). According to socio-cultural perspective, people judge others based on their physical appearance and behave differently towards them, so that attractive people are often more favorable than unattractive people (24). Similarly, Rosen and Underwood (2010) showed that those who have less facial attraction are less favorable compared with those that have higher facial attraction (25).

Most cosmetic surgeries are carried out for reasons and hope for higher satisfaction from their appearance, but the main motivation for implementing cosmetic surgeries is to improve their mental performance (26). Though performing cosmetic surgeries can be helpful in terms of both physical and psychological health aspects, but if it is not properly implemented, it can bring many dangers for the consumers (27). Unofficial statistics have shown that during the year almost 120 people were victims of these surgeries (28). On the other hand, excessive surgeries result in financial burden on the economy of the community and the health care system. In 2012, it has been reported that Iranian men spend more than 50 million dollars annually for rhinoplasty surgeries, while they spend almost two times of that amount on Botox. However, women accounted for the majority of applicants for cosmetic surgeries (29). Therefore, this issue should also be considered as a medical complication.

According to research, clinical services providers play a crucial role in decision-making and helping people to carry out their actions (30). When cosmetic surgery is carried out only for cosmetic reasons, clinical services providers should be particularly vigilant in assessing opportunities for surgery, because there are physical and psychological risks involved (31). Currently, increase in the number of applicants for cosmetic surgery has created a lot of questions and the fundamental question that is always asked despite the risks involved in it is that do patients referred for cosmetic surgery consider the motivations and consequences?

According to the mentioned points, cosmetic surgery is a multi-faceted phenomenon that is associated with mental and social parameters and many quantitative studies have revealed the reasons for cosmetic surgery, while there are few numbers of qualitative researches that reveal attitude and personal experiences of individuals. Therefore, the aim of this study was to recognize the motivations considered by men and women for cosmetic surgeries and also explain their experience of cosmetic surgery based on their own narration.

Methods

Study Design

This study is a part of a doctoral thesis aimed at identifying and explaining the factors influencing the decision to perform deep facial cosmetic surgeries. The study was carried out in West Tehran, Iran between the year 2014 and 2015 utilizing qualitative content analysis. Qualitative content analysis is a qualitative research method and also a qualitative data analysis method (32). Content analysis method is subjective interpretation of the content of the text that is carried out by the classification codes and identification of themes regularly (33). Content analysis was appropriate for this research because it is a good method of analysis that can easily accommodate a large amount of data (32).
Participants

In this study, purposive sampling was utilized to select participants. After obtaining the necessary permissions, the researcher referred to the Medical Records Department of Cosmetic Surgery Center, then the lists of the names of people who had undergone surgery at the center, and 21 participants who had cosmetic surgeries (7 men and 14 women) between one and five years ago were selected for this study. Thirteen (13) participants were between 22-30 years of age and the rest were over 30 years. Eleven (11) of them were employed and the rest were housewives or students. Five (5) of the participants had diplomas and the rest had university education, 9 of the participants were single, 11 of them were married and 1 of them was divorced. Inclusion criteria included cosmetic surgery carried out under general anesthesia, at least three months after the surgery, possibility of accessing their addresses and phone numbers, completely vigilant at the time of data collection and willing to participate in the study. This research tried to qualify individuals with maximum diversity in terms of age, sex and type of cosmetic surgery.

Ethical considerations

The study was adopted by the Medical Research Ethics Committee at the School of Nursing and Midwifery, Kerman University of Medical Sciences Number (K.93/241, 2014/10/04). Informed consent was obtained from all participants. Participants were assured that they will remain anonymous and they are free to stop the interview at any time; in addition, they can refuse to answer any question.

Data Collection

Data was collected via semi-structured interviews which were implemented through face to face interview techniques. First, the researchers explained the objectives of the study to participants. The interviews were carried out mainly at work, home while few participants were in the park. Interviews lasted between 45 to 90 min, Data were collected from 21 interviews.

Initial interview inquiries

At the beginning of the interview, the open-ended questions were asked in order to encourage participants on which subjects they could freely speak about personal experiences. Examples of questions asked were as follows: how were you feeling before the surgery? Why did you decide to perform this surgery? As well as considering the experiences that the participants expressed, other probing questions were asked depending on each participant and were suggested to fully understand the experiences. In order to increase the depth of the interviews, probing questions like; what do you mean? Explain and give an example, were used.

Analysis

Data was analyzed with the approach of Landman and Granhaym (34). This means that all interviews were recorded with an MP3 player device. Interviews were listened several times and were typed using verbatim and the data were studied in order to better understand the meaning, units in the interviews were identified and initial codes were extracted. Codes were classified based on similarities in themes and sub-themes. When themes were emerged and the data was saturated, interviews ended. The main theme including several themes and sub-themes was extracted. The accuracy and robustness of data (validity, reliability, and the ability to transfer confirmation) were examined utilizing the criteria proposed by Cuba and Lincoln (35). For data validation, interaction and closeness with participants as well as peer review and comparison was fixed. Data reliability was assessed by evaluation experts and appeals were made by the participants and outside observers. The researchers also tried to avoid previous judgments and to achieve adequate compliance, their previous beliefs were ignored. To transfer the research results to other people who were eligible for the study, findings were presented to them in order to approve the extracted concepts with their experiences.

Findings

The main theme of this study was "A chance for a better life" which consisted of the two main categories including “Gaining social opportunities” and “Gaining the approval and acceptance in society”. Finding the right person to marry, finding job and high social status were classified as sub-categories of “Gaining social opportunities” and Drawing public attention and drawing attention of the opposite sex were introduced as sub-categories of “Gaining the approval and acceptance in society”. The main categories and sub-categories are listed in Table (1).
Table (1): Main categories and sub-categories of opportunity for a better life theme

<table>
<thead>
<tr>
<th>Themes</th>
<th>Main categories</th>
<th>Sub-categories</th>
</tr>
</thead>
</table>
| A chance for a better life | Gaining social opportunities          | - Finding the right person to marry  
|                         | Gaining the approval and acceptance in society | - Drawing public attention  
|                         |                                      | - Drawing attention of the opposite sex |

Gaining social opportunities

Trying to obtain social opportunities was one of the reasons for cosmetic surgery. Marriage, employment, and success was the most important reasons for men and women, especially women who were seeking for social opportunities in the community and cosmetic surgery gave them that chance in this situation.

Most interviewees believed that beauty is the main criterion for marriage in this era. Hence everyone must be beautiful to be popular. Women are especially forced to have the right partner, in the face of competition; there are different ways to enhance their beauty and one of them is cosmetic surgery. "I feel if I had no cosmetic surgery maybe I could not marry with a suitable case" (A 24 year-old woman, married and student).

Another participant said that: "Many of us, whether boy or girl performs cosmetic surgeries to find someone better for marriage" (A 22 year-old Man, single, and self-employed).

A participant in response to the question that: “what do you want to achieve from cosmetic surgery? She said: "Finding a Proper person for marriage, to increase my suitors, so that I can choose the best one to marry" (A 24 year-old girl, single and student).

Some believe that since in our society, girls are more selected, then they should be completely flawless, meaning that evaluative look leads them to pay attention to their facial beauty. “In our society, a girl can never proposed to a man, so we have to wait, and we should be totally an ideal case for them to come to us, for example, we have to carry out a series of surgeries to find our favorable person” (A 26-year old girl, single and graduate student).

The quest for achieving a perfect job position is another factor that tends to motivate them to perform cosmetic surgery. "Well it was important for me to have a good image because when you have surgery, your self-confidence is raise and influences the job that we want to have, or maybe you want to have a very high social position so you should have a good face" (A 22- year old man, single, and self-employed).

"Now, even going to work and finding jobs are related to women beauty in our society. I went to many places to look for job and I saw they only consider my beauty not veils and my behavior. They just look at you if you are beautiful or not, then they let you enter the workplace"(a 26-year-old woman, single and student).

Some participants believe that cosmetic surgery is a blessing from God and think it is a science that has been given to human, therefore performing this surgeries has no problem and sometimes they are necessary. “Cosmetic surgery is a science ... if it is interfering with God’s work then no operation should be implemented and no one should be treated. There are many tools for saving the lives of people, whenever there is a problem, a solution should be
A lot of people are born with problems of physical appearance, then why shouldn't cosmetic surgery be used to solve this problem? (A 42 year-old woman, married and practitioner)

"I say that cosmetic surgery is a blessing that God gave us... If God did not want it, then he shouldn’t have given this knowledge ... If he gave this knowledge then humans can change him/herself a little for more beauty...". (A 22 year-old man, married, diploma and soldier)

Gaining the approval and acceptance in society

According to the interviewees, they were seeking to have two types of attention by performing cosmetic surgery including drawing public attention and drawing the attention of the opposite sex. When the body and the appearance of a person is in violation of the appearance, weight, height and shape which are common social status then the people might be noticed since they lack social position. Therefore members of a social group may convince and force people to be socially acceptable through judgment, reward, and punishment of people. Acceptance in society is another motivation for performing cosmetic surgery. "When I see someone who has a better appearance, I feel the person is more acceptable in the society, when I see, I want to marry or I am looking for a job, people look at the if I am beautiful or not, then I said to myself, why not perform cosmetic surgery?" (A 22 year-old man, single, and self-employed).

"When I see that women who have cosmetic surgery are of most interest to the community, then I said to myself, why don’t I do it?" (A 24 year-old woman, married and student).

The "face" is used as the most exposed body part in social communications. Facial attractiveness makes predictable differences in the general and specific communication while the impacts and attractiveness of faces can be changed and adjusted in combination with other features, status changes. For these people, cosmetic surgeries influence communications and draws public attention to them. "As soon as you do cosmetic surgery, the group of people who live with you in the workplace will change their behavior towards you, they somehow deal with you in a way I do not understand, it seems as if you did not have that character before, after surgery they all behave well towards you and more acceptable to you "(A 26-year old girl, single, and practitioner).

Women and men are socialized in such a way that they see themselves through the eyes of the opposite sex. They have been socialized in such a way that they consider the view of opposite sex about themselves. "I always thought I can attract a man ... be beautiful in his eyes... when you are more pretty, better men will give marriage proposal to you and have a better position in the society" (A 24-year-old girl, single and student).

"... The opposite sex certainly had an impact... never a man does not catch own beauty for his own sake, and just does it for the opposite sex... especially in Iran " (A year-old old man, married, diploma and soldier).

Someone introduced failing to attract the opposite sex as motivation to perform cosmetic surgery. "I was a 19-20 years old a girl. At this age, the girls want to draw the attention of the opposite sex ... When I went out I felt men do not pay any attention to me ... I always thought it may be because of the my nose, That caused to be less my beauty. I’m not saying I need them to look at me, but every girl feels that she wants to attract a man to herself ". (a 24-year-old girl, single and student).

Therefore, it can be said that pretty face as a capital in this context for women and men, gives them the opportunity to pursue a different approach for identification and desirable lifestyle and finally use these tools to convert this capital into opportunities and advantages in personal and social life (attention, popularity, position, concessions in the marriage etc.).

Discussion

In this study, it was demonstrated that “Gaining social opportunities” and “Gaining the approval and acceptance in society” are the reasons why people decide to have cosmetic surgery. The experiences of participants indicated that they were trying to achieve opportunities and privileges and finally socio - economic and social success by performing cosmetic surgery. They think obtaining opportunities such as marriage and employment is related to the use of cosmetic surgery. Most people expect that cosmetic surgeries give them a young and beautiful look, and increase their chances of obtaining decent jobs, income, and better marriage. The results revealed that if people are not willing to take the risk of cosmetic surgery, then they are more likely to lose their ideal career opportunities. On
the other hand, they believe that cosmetic surgery is a blessing from God and believe that it is a science given to humans, accordingly interpreted that using this science is essential in their life and also they believe that a person may lose a good chance in her life due to defects or physical appearance.

Since the social and professional opportunities, are unevenly distributed, then some people may not be beautiful in terms of culture and fail to achieve the necessary facilities, and therefore be disappointed (1). In fact, women have the expectations towards a desirable social position which lead them to attempt entertainments including superficial and cosmetic surgery (36). Cosmetic surgery is an opportunity given to people so that they rebuild their body as dictated by the media and society. Making such an identity is a dream that drove the people to accept the risk of cosmetic surgery (1). Accordingly, having a cosmetic surgery regardless of the outcome is a determinant priority in their lives.

Powell-Hicks, (2011) in his study suggests that physical attractiveness plays a crucial role in relationships. Attractive people receive more job offers than unattractive applicants (37) Campana et al, (2012) concluded that beauty is a product that can be sold, and women who don’t search for it cannot successfully achieve this product socially (38). In another study carried out by Langliuz et al. using meta-analysis techniques, it was shown that attractive people are more likely to be evaluated as qualified and competent professional. In a study carried out in 26 countries worldwide, both men and women have introduced attractive face as one of the most important criteria for selecting a wife (39). Darisi et al (2005) in a qualitative research on people who had the desire to perform cosmetic surgery reported that they thought they could act with social and emotional benefits to their own advantage (40).

Saucier (2004) , Didie & Sarwer, (2003) in their studies suggested that many social benefits of a beautiful young appearance, such as employment and romantic prospects may be motivated more by women using this method (41,42). Edmonds (2002) in an ethnographic study on Brazilian women, found that body dissatisfaction, achieving acceptance of partner, fear of "being replaced" by a more attractive woman, and the desire to improve the chances of achievement and friends are the main reasons for performing cosmetic surgeries (43). Ward, (1998) also stated that achieving attractive face to acquire employment and social situations and also increase the chances of dating and finding wife are factors involved in performing cosmetic surgery (44). The mentioned reasons have also been introduced in the present study as priorities in terms of audience perspective. Concerns about their appearance lead women to accept the option of performing cosmetic surgery as a means to increase their self-confidence and increase their social and professional potential (8, 45, 46).

Some studies in Iran have demonstrated that cosmetic surgery may improve a person's self-esteem, sexual attractiveness so that through cosmetic surgery, the individual in society will be accepted and allowed to move upward economically and socially (1). Several studies have revealed that people take beauty as a factor that can hinder them from having a successful social role in their interactions and therefore make all attempts in order to be seen and accepted and can also make their body form similar to the social accepted pattern. They want to present themselves for being seen and draw others attention especially the attention of the opposite sex. According to Swami, (2009), the growing importance of attractiveness and its importance in success, leads to increased social pressure to be attractive, and sometimes it seems that social acceptance and personal success depends to a large extent on beauty (47), because appearance is important, and it is the key factor for success in life (48).

Stefanile et al, (2014) in their study concluded that surgery is a tool for being more attractive than others and it has social rewards (49). Similarly, Sherry et al, (2004) demonstrated that cosmetic surgery is considered by some people as a way of obtaining the expectations of other people and draw their attention (50). Mirsardoo et al., (2011) in his research in Iran concluded that there is a significant relationship between social factors such as finding the right partner, social recognition by others, finding better jobs, job promotion and trend toward cosmetic surgery in women and the tendency to have cosmetic surgery has become a fashion and it is considered in determining social status (51). Rastgar Khalid ,et al (2013) in a qualitative research aimed at evaluating the subjective reasons why Tehran citizens resort to cosmetic surgery , have identified social acceptance as the reason they perform cosmetic surgery (51).
Conclusion

In this study, face cosmetic surgery is taken into consideration as a group and community function in the context of urban life in Tehran and Islamic Country Iran. In the new Iranian society, the importance of appearance has increased as a measure of value because, appearance and beauty are considered as selection criteria for desirability and are also even better tools to succeed and enter into higher societies. The findings of the present research demonstrated that based on the participants’ experiences, beauty and having it is important for people more than anything else, most people like to look good and be involved in community because face is the most important aspect in the person and individuals feel that beautiful face help them to have better social presence and also be more successful in their interactions. Otherwise, they may be rejected by society and jobs and opportunities for a better life. It can be said that the people resort to cosmetic surgery in order to show their identity and dignity and promote the different stages of life, the continuation of this success, popularity, better positioning in marriage and other concessions. It seems that the body attractions especially facial beauty, lead to human freedom and choice to their fate and chance to a better life and this can be a reason why Iranian men and women crave for cosmetic surgery despite the risks involved and to change their appearance for encouragement. However, the study results provide valuable insight to healthcare providers. Understanding experiences of these individuals may help health care team to provide better care and other individuals who might think about doing cosmetic surgery to help them make a better decision.

Limitations and suggestions

In this study, despite the mechanisms applied to enhance the accuracy, Such as participation in the study with maximum variation, had some limitations. The field was limited to a specific geographic location, other people may experience other things than the ones mentioned in this study. It is therefore recommended to repeat the study in other areas.

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References


35. Lincoln YS, Guba EG. Fourth generation evaluation: Sage; 1989


37. Powell-Hicks Allycin. Body Objectification and Elective Cosmetic Procedures in African American Women, Thesis submitted in partial satisfaction of The requirements for the degree of Master of Arts in General Psychology School of Science and Technology In conjunction with the Faculty of Graduate Studies, Loma Linda University,2011: 50 pages.
47. Swami, V. Chamorro-Premuzic, T. Bridges, S. Furnham A. Acceptance of cosmetic surgery: Personality and individual difference predictors Body Image, 2009: 6 , pp. 7–13
52. Rastegar khaled A, Kaveh M. women and beauty project (subjective meanings of cosmetic surgery) journal of woman in development and politics (women’s research)
Comparison of Serum Sodium And Potassium Levels; Based On Two Methods Arterial Blood Gas And Automatic Laboratory Analyzers

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ABSTRACT:

Background: Electrolytes are substances carrying electric charge and are crucial for proper cellular function in most of body tissues. Concerning the importance of quick measurement of electrolytes in emergency cases, this study was designed to compare results from Arterial Blood Gas (ABG) analysis and laboratory Automatic Analyzers (AA) test for determination of electrolytes in the patients.

Patients and Methods: In this cross-sectional study, 88 files from Sayyad Shirazi Hospital in Gorgan (Iran) during 2015 were chosen using simple random sampling (44 for each group). Results from both AA and ABG analyses for blood Na and K were recorded in these files. The results of AA and ABG tests for sodium and potassium determination were compared.

Results: The mean sodium levels measured in the samples were 136.35±5.25 mmol/L by AA and 140.89±6.37 mmol/L by ABG test. The determined sodium levels were significantly correlated in the two methods (Pearson correlation coefficient= 0.55 and P<0.001). Mean levels of potassium in the samples were 4.52±0.71 mmol/L in AA test and 3.52±0.75 mmol/L in ABG test. The determined potassium levels were significantly correlated in the two methods (Pearson correlation coefficient= 0.53 & P<0.001).

Conclusion: In general, there is a significant correlation between the arterial blood gas analysis and the laboratory auto-analysis in determination of sodium and potassium.

Keywords: Arterial Blood Gas, Analyzer, Laboratory Auto-Analyzer, Sodium, Potassium

Introduction

Electrolytes are substances carrying electric charge; and they’re crucial for proper cellular function in most of body tissues (1). Electrolyte disorders may cause serious risks for man’s life. Levels of electrolytes are measured for every critically ill emergency patient and also for patients hospitalized in the intensive care unit (ICU) (2).

Generally there are two methods for determination of serum electrolytes; direct and indirect. In both methods ion-selective electrodes are utilized. In the indirect method, which is the gold standard method for determination of sodium and potassium, the samples usually get diluted and the procedure is done by the auto-analyzer (AA).(3-5) In the direct method, the electrodes are fully in contact with no diluted blood sample. Arterial blood gas (ABG) analyzer or points of care testing (POCT) are mostly used in this method (2).
AA method is carried out in a hospital central laboratory which may lead to long delay (several hours in some cases) between the time of test application and receiving results (2). However, ABG and POCT methods help doctors do the initial clinical treatments; and these methods are also clinically and economically cost-effective for the patients (6).

Earlier studies that evaluated the accuracy of ABG analyzers in measuring electrolytes came to this conclusion that the results of these two separate measurement technologies are meaningfully different for serum sodium and chlorine concentration. This difference was notably calculated as anion gap (AG) and influenced ion levels (7-9). Other studies have found significant differences between ABG analyzers and more advanced analyzers measuring pH, potassium and hematocrit (10-15). Also some studies have mentioned a high degree of accordance between the results of these two methods for determining blood gases and pH (16, 17).

Therefore, considering the importance of rapid analysis of electrolytes in emergency cases and the potential value of ABG analyses for sodium and potassium in critical conditions, and the necessity of time and expense saving, for the first time in north of Iran, this study was designed to compare the results from AA and ABG methods for sodium and potassium determination in the patients admitted to Sayyad Shirazi Hospital in Gorgan (Iran).

**Materials and Methods**

The study population included all the patients admitted to Sayyad Shirazi Hospital in Gorgan (Iran) during 2015. In the beginning, the files of patients, hospitalized in different departments of hospital, were assessed. The inclusion criteria were if the results of both AA and ABG methods were recorded in the file and the exclusion criteria were patients which had undergone interventions for treatment of fluid and electrolytes imbalance. The data including age, sex and other variables were separately recorded in data forms for every patient. After checking 826 files, 88 samples were extracted and registered randomly. The patients were divided into two groups based on the median age; middle-aged (< 50yrs) and old (≥50yrs). They were divided into three groups according to their blood pH indicated by ABG analysis; normal pH (7.35≤pH≤ 7.45), acidosis (pH< 7.35) and alkalosis (pH> 7.45). Mean serum sodium and potassium levels, by AA and ABG methods, were assessed both generally and individually in different groups based on pH, age, sodium and potassium levels.

In the laboratory of hospital, a device named **OPTI CCA-TS** was used for ABG analysis, which measured serum sodium and potassium level by photometry; and there was a **Biolyte 2000** auto-analyzer too, that was only utilized for determination of serum sodium and potassium.

**Statistical analysis**

The obtained data were analyzed by SPSS-18 software. Frequency, percentage, mean level and standard deviation were used to describe the data; and to determine the correlation between the results from the two methods, **Pearson correlation coefficient** was used. To measure the mean difference between the two methods in terms of sodium and potassium levels in different groups, the independent **t-test** and **ANOVA test** were used. Differences were considered significant at P<0.05.

**Results**

Among the 88 patients who participated in this study, demographic data was according to table 1.
The mean sodium levels determined by AA and ABG methods were significantly correlated. (P<0.001) Another significant correlation was seen in mean potassium levels indicated by these two methods (table 2).

<table>
<thead>
<tr>
<th>Electrolyte</th>
<th>Analysis method</th>
<th>Mean level</th>
<th>Pearson’s correlation coefficient</th>
<th>Mean difference in results of the two methods</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (mmol/L)</td>
<td>AA</td>
<td>136.35±5.2</td>
<td>0.55</td>
<td>5.4</td>
<td>2.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>ABG</td>
<td>140.89±6.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium (mmol/L)</td>
<td>AA</td>
<td>4.52±0.7</td>
<td>0.53</td>
<td>1.7</td>
<td>0.61</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>ABG</td>
<td>3.52±0.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean differences in sodium and potassium levels determined by AA and ABG analyses, also was evaluated.

In groups of normal pH, acidosis and alkalosis, mean sodium levels, measured by AA and ABG methods, were significantly correlated (P<0.001); however, in terms of potassium level, the correlation was significant for normal pH and alkalosis groups but not significant in acidosis group.(P>0.05)(table 3)

<table>
<thead>
<tr>
<th>Acidity</th>
<th>Analysis method</th>
<th>Mean</th>
<th>Correlation coefficient</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>Normal acidity</td>
<td>AA</td>
<td>136.32±5.4</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>141.61±7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acidosis</td>
<td>AA</td>
<td>135.25±6.2</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>139.19±4.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alkalosis</td>
<td>AA</td>
<td>137.5±2.7</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>140±3.7</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>Normal Acidity</td>
<td>AA</td>
<td>4.44±0.7</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>3.37±0.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acidosis</td>
<td>AA</td>
<td>4.88±0.6</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>4.18±0.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alkalosis</td>
<td>AA</td>
<td>4.44±0.5</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABG</td>
<td>3.37±0.6</td>
<td></td>
</tr>
</tbody>
</table>
Electrolyte abnormalities are one of the common reversible causes of morbidity and mortality in patients admitted in hospitals. The levels of electrolytes need to be monitored on regular basis in the patients which are ordered in ABG or serum sample as per the convenience of sampling and requirement. The results of both types of measurement are used in inter exchangeable manner with the assumption that they are equivalent. There are a lot many controversies in the reports of the estimation of electrolytes of serum and ABG from different hospitals. The Research Gate discussion on correlation between electrolytes in blood gases and serum electrolytes ensued that the serum electrolytes are more reliable, while some argue accuracy depends on the machines.

In present study we suggest that ABG method shows higher results in sodium level and lower results in potassium level. In the study of Quinn et al (2013), conducted on 100 patients, serum sodium and potassium levels did not show any significant difference in the physiological range; however, in terms of hyperkalemia range (potassium > 5 mmol/L), the results of ABG analyses were noticeably different from the standard venous tests (difference = 0.44 mmol/L and P<0.0013). In our study, sodium levels reported by the two methods, had the least correlation coefficient (P=0.105). Potassium levels reported by the two methods represent the most correlation coefficient (P=0.002) in hyperkalemia cases unlike the above-mentioned study. In hypokalemia cases there was not any significant correlation (P=0.505) while showing the least mean difference in measurement by the two methods.

The study of Chhapola et al. (2013), conducted on 59 patients, evaluated mean level of sodium in both methods and found meaningful data comparing the results of ABG analyzers to AA. However, of the potassium level, this difference was meaningful in hyperkalemia and normokalemia subgroups. This difference was not significant in hypokalemia cases. In our study, mean sodium levels of the entire sample were 136.35 mmol/L and 140.89 mmol/L calculated by auto-analyzer and ABG analyzer, respectively. The difference of the mean levels was 4.54; and these values were significantly correlated (P<0.001). This correlation was minor in normonatremia group comparing to hyponatremia. Mean levels of potassium determined for the entire sample were 4.52 and 3.52 by auto-analyzer and ABG analyzer, respectively. The difference of the numbers was 1, and a significant correlation was seen in these values (P<0.001). This correlation was less in hypokalemia cases comparing to normokalemia and hyperkalemia groups. However as well as the mentioned study, in hypokalemia cases the difference between the results of the two methods was 0.45 and non-significant.

About the study of Budak et al. (2012) on 84 patients, results indicated that sodium and potassium levels, measured by ABG an AA methods, are not equal. The results of our study are confirmed concerning the inequality of AA an ABG test results.

The study of Jain et al., which was done on 200 patients, indicated that there is a statistical difference between the two devices measuring sodium; however, there was no meaningful difference in potassium levels determined by the two devices. In our study, significant differences were observed between the two methods for measurement of both sodium and potassium.

Conclusion
According to our findings, there is a significant correlation between the results of auto-analyzers and arterial blood gas analyzers in determination of serum sodium and potassium levels. Acidosis, hypokalemia, hyperkalemia and alkalosis groups had the highest sodium levels measured by both methods; and in terms of potassium level, hyperkalemia and alkalosis groups were the highest.

Conflict of interest
The authors declare that they have no conflict of interests.

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References:

8. The United States Clinical Laboratory Improvement Amendments. 2006.
Depression and Internet Addiction in Students

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Abstract

Background: depression is fourth leading cause of disease burden in both sex and it is the first cause of disease burden in women in IRAN. Depression in college students is more common than the general population and they are considered as high risk group for internet addiction. This study examines the relationship between internet addiction and depression in the students.

Materials and methods: In a cross sectional study, questionnaires included (BDI-II & Internet Addiction Scale (IAS)) distributed among 150 students who intended to participate in the study. The relationships between variables examined by SPSS 20 using t-test and Pearson's correlation coefficient.

Results: There was a significant correlation between internet addiction and depression (p<0.001; r=0.222). 21% of subjects have mild, 18/3 have moderate and 17/6 have severe depression. 5.9 of samples have mild internet addiction. There was significant correlation between average number of hours of Internet usage and BDI-II and IAS scores of students. Independent sample t-test revealed that there were no significant differences in BDI-II and IAS scores in both sex and also marriage status of samples.

Conclusion: There was a significant correlation between internet addiction and depression scores, average number of hours of Internet usage related to depression and internet addiction than students that have some depression should be evaluated on internet addiction vice versa

Key words: depression, depressive disorders, university students, Internet Addiction

Introduction

Depression is the fourth top cause of burden of disease in Iran [1]. It is a prevalent health condition that afflicts 15% of adult population once in their lifetime [2]. Depression rate among students, according to different studies, is in 10-85% range (mean = 30.6%) [3]. A study by Pourkiani et al. (2016) in Larestan University of Medical Sciences, Iran showed that 49.7% of students were suspects for having health problems and 46.5% of them were suspect depression cases [4]. The society incurs higher costs due to depression in the youth comparing with depression in other age groups as the former group is supposed to be future of the society [5]. Depression leads to lower performance in college [6], attempting suicide [7, 8], unstable interpersonal relationships [9], and lower productivity at work [10]. Factors like life in dormitory, experiencing unpleasant life events, having fewer friends and less social activity, and the effects of other students all increase risk of depression [11, 12]; while religion is a protective variable against depression [13]. Depression might be a prognosis of Internet addiction and or a cause of overdependence on the Internet. For many, the Internet is a key element in their lives. They use the Internet to do shopping, seek information, and share their ideas with others. Studies on the Internet dependence were started by the Kimberly Young’s (1998) work in the USA and soon the topic became part of the mainstream of research works all around the world. This trend of studies was expanded in education field by the attempts to examine the effect of Internet dependence on educational performance of students [14]. From clinical point of view, Internet caused behavioral problems have different names such as Internet addiction, problematic use of the Internet, and ill-use of Internet.
the Internet and all of these refer to almost the same concept [15]. Internet addiction disorder is a multidisciplinary phenomenon and challenges different fields of science such as medicine, computer, sociology, laws, ethics, and psychology and each one of these disciplines approaches the problem from different aspect [16]. Internet addiction is a mental dependence on the Internet that is characterized with a- Spending time and money on Internet-related activities in an excessive manner; b- Unpleasant feeling when not connected to the Internet (e.g. anger); c- high tolerance to the effects of internet connection; and d- denying the problematic behavior [17]. To carry out class assignment, communicate with friends, and spend leisure time, the youth need to learn and use the Internet. The problem appears when Internet addiction causes negative effects on educational performance, social relationships, and emotions of the youth [18]. Juveniles who develop Internet dependence tend to show more aggressive behaviors [19]; and Internet dependence results in negative physical, psychological, and social outcomes [20]. Students are of the groups with high vulnerability to Internet dependence, which expresses itself in the form of withdrawal from social activity, loneliness, and depression. Excessive use of the Internet negatively affects educational performance in college and it has to do with drug abuse as well [21]. Some factors increase the risk of Internet addiction such as psychological and growth factors at the late adolescence, easy access to the Internet, and expectations about using computers and the Internet [18]. Improper use of the Internet and surfing the Net for the sake curiosity not only distract the students from the main usage of the Internet for academic purposes, but also may negatively affect students’ educational performance as such behaviors lead to development of a sort of Internet addiction so that the student will spend the main portion of their leisure times on the Internet [22]. Akin and Iskender (2011) argued that, although, the relationship between Internet addiction and social, educational, and physical variables has been thoroughly surveyed, the strong relationship between Internet addiction and emotional variables (e.g. anger, depression, and stress) has been barely examined [23]. There have been studies in Iran that, among the other things, have dealt with the relationship between depression and Internet addiction; however, there has been no study specifically on depression and Internet addiction. The present study, therefore, deals with the relationship between depression and the level of Internet dependence in students.

**Material and Methods:**

A descriptive-correlative study was carried out in two medical sciences faculties in Fars Province, Iran. The participants were selected through convenient sampling among the students interested in participation. Totally, 150 questionnaires were distributed and 125 were returned out of which 119 questionnaires were used in data analyses.

**Data gathering tools**

a. **Internet Addiction Scale (IAS) (Young 1998):** The scale was developed by Kimberly Young in 1998 [17] with 20 five-alternative items. Different aspects of Internet addiction are measured by the scale and maximum possible score is 100. Scores from 0 to 39 are interpreted as no dependence or normal user; scores from 40 to 69 are interpreted as probable or trivial dependence, and scores from 70 to 100 are interpreted as Internet addict.

b. **Beck Depression Inventory (BDI-II),** with 21 questions each with four alternatives (0-3), measures depression level and its maximum possible score is 63. Based on the score subjects are categorized in four groups of no depression (score range: <13), trivial depression (score range: 14-19), mediocre depression (score range: 20-28), and severe depression (score range: 29-63).

At first, face validity of the questionnaire was examined by five faculty board members of Shiraz University of Medical Sciences. To examine reliability of the questionnaire, a pilot study and Cronbach’s alpha were used; $\alpha$-values for IAS and BDI-II were 0.93 and 0.91 respectively.

**Results**
Table 1 lists demographics of the participants.

<table>
<thead>
<tr>
<th>Demographical variables</th>
<th>BDI-II</th>
<th>Total number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum depression (no depression)</td>
<td>Trivial depression</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>22 (45.8%)</td>
<td>11 (9.22%)</td>
</tr>
<tr>
<td>F</td>
<td>29 (40.8%)</td>
<td>14 (19.7%)</td>
</tr>
<tr>
<td>Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associates</td>
<td>5 (83.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Bachelors</td>
<td>46 (40.7%)</td>
<td>25 (22.1%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>5 (41.7%)</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>Unmarried</td>
<td>45 (43.3%)</td>
<td>24 (23.1%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td>31 (44.9%)</td>
<td>17 (24.6%)</td>
</tr>
<tr>
<td>Surgery room</td>
<td>5 (62.5%)</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Anesthetist</td>
<td>0 (0%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>Medical emergencies</td>
<td>5 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Lab sciences</td>
<td>8 (33.3%)</td>
<td>5 (20.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>51 (42.9%)</td>
<td>25 (21%)</td>
</tr>
</tbody>
</table>

Table 2 - Results obtained from IAS and BDI-II

<table>
<thead>
<tr>
<th>Variable</th>
<th>Depression</th>
<th>Internet dependence</th>
<th>Duration of using the Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>Mean score (SD)</td>
<td>17.23(1.2)</td>
<td>0-60</td>
</tr>
<tr>
<td></td>
<td>Actual range</td>
<td>0-60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pearson’s correlation (R)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Internet dependence</td>
<td>Mean score (SD)</td>
<td>16.48(1.16)</td>
<td>0-57</td>
</tr>
<tr>
<td></td>
<td>Actual range</td>
<td>0-57</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pearson’s correlation (R)</td>
<td>0.222*</td>
<td></td>
</tr>
<tr>
<td>Duration of using the Internet</td>
<td>Mean score (SD)</td>
<td>1.5(1.2)</td>
<td></td>
</tr>
</tbody>
</table>
As listed in Table 2, mean scores of the subjects in IAS and BDI-II are 16.48±1.16 and 17.23±1.2 respectively. In addition, Pearson’s correlation shows that there is a significant relationship between Internet addiction and depression (r=0.222, p<0.05). There are also significant relationship between using the Internet and score of depression (r=0.366, p<0.01) and between duration of using the Internet and level of dependence on the Internet (r=0.590, p<0.01).

Table 3- Frequency of Internet addiction and depression in the subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet addiction</td>
<td></td>
</tr>
<tr>
<td>Normal users (no dependence) (score: 0-39)</td>
<td>107 (89.6%)</td>
</tr>
<tr>
<td>Marginal users (trivial dependence) (score: 40-69)</td>
<td>11 (9.6%)</td>
</tr>
<tr>
<td>Dependent users (addicted) (score:70-100)</td>
<td>1 (0.8%)</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>No depression (score&lt;13)</td>
<td>51 (42.9%)</td>
</tr>
<tr>
<td>Trivial depression (score: 14-18)</td>
<td>25 (21.0%)</td>
</tr>
<tr>
<td>Mediocre depression (score: 20-28)</td>
<td>22 (18.5%)</td>
</tr>
<tr>
<td>Severe depression (score: 29-63)</td>
<td>21 (17.6%)</td>
</tr>
</tbody>
</table>

As listed in Table 3, 9.6% of the subjects are at the edge so that they had trivial dependence on the Internet. In addition, 89.6% of the subjects are normal Internet users and there is only one subject in the addicted group.

Table 4- Independent t-test on the variables gender and marital status in terms of total depression and internet dependence scores

<table>
<thead>
<tr>
<th>Mem</th>
<th>Women</th>
<th>t</th>
<th>p-value</th>
<th>Unmarried</th>
<th>Married</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean score</td>
<td>SD</td>
<td>Mean score</td>
<td>SD</td>
<td>Mean score</td>
<td>SD</td>
<td>Mean score</td>
<td>SD</td>
</tr>
<tr>
<td>Depression</td>
<td>16.39</td>
<td>11.8</td>
<td>17.87</td>
<td>12.58</td>
<td>1.76</td>
<td>0.08</td>
<td>16.6</td>
</tr>
<tr>
<td>Internet dependence</td>
<td>21.72</td>
<td>14.34</td>
<td>16.82</td>
<td>15</td>
<td>-0.619</td>
<td>0.537</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 4 lists independent t-test results about the level of depression based on gender and as listed, there is no significant difference in this regard (p-value=0.08, t=1.76). In addition, there is no significant difference between the two genders in terms of Internet dependence (p-value=0.537, t=-0.619). Results of independent t-test also shows that there is no significant difference between married and unmarried participants in terms of depression score (p-
value=0.127, t=1.53). Moreover, there is no significant difference between married and unmarried subjects in terms of Internet addiction. (P-value=0.107, t=1.62)

**Discussion**

The term addiction refers to psychological and physical dependence and emergence of withdrawal syndrome when the individual does not have access to the drug or item to which he/she is addicted. Clinically speaking, addiction might refer to one’s attempt to control depression and anxiety and an indicator of deep sense of inner insecurity or sense of emptiness [24]. In light of this, one of the objectives of the present study was to determine depression level in the students. The results showed that the prevalence of depression was 42.9%; in addition 21% of the subjects had minimum depression (no-depression), 18.3% had mediocre depression, and 17.6% had severe depression. Mean BDI-II score of the subjects was 17.23±1.2. Pourkiani et al. (2016) showed that 46.5% of health problems of the students was related to depression disorder [4]. The level of depression in the students was higher than that of the public (9%) [3]; this means that students are in depression vulnerable group and need special attention.

Moreover, 5.9% of the subjects were at the edge and had trivial Internet dependence and 94.1% were normal Internet users. No significant difference was found between men and women in terms of Internet addiction (t-test). Alavi et al. reported that 10% of their respondents were Internet addicts [16] and Kim et al. (2006) studied 1537 high school students in South Korea and found that 1.6% were Internet addicts and 38% were suspected for Internet dependence [24]. Nazi (2012) in Lebanon reported that Internet dependence rate was equal to 4.2% [14].

Moreover, t-test results revealed that there was no significant difference between men and women with regard to Internet addiction. Consistently, Fortson et al. studied students in Virginia University and showed that there was no significant difference between men and women as to mean time duration of Internet use [25]. Yen et al., on the other hand, argued that there was a significant difference between men and women in terms of Internet addiction so that it was more prevalent in the former group [26]. Alavi et al. in Iran showed that risk of Internet addiction in men was 1.8times higher than that of women [16]. This might be because of the difference between men and women with regard to Internet access; however, our subjects were identical in this regard.

Mean score of IAS of the subjects in this study was 16.48±1.16. Kim et al. studied high school juveniles and reported mean score of IAS of the subject equal to 37.58 [24]. Beigi et al. (2009) studied subjects with average age of 20.95±1.41 (students of Arak University of Medical Sciences) and reported mean score of IAS of the subjects equal to 32.74±14.52 [22]. Results of the present study showed that there was a significant relationship between Internet addiction and depression (p<0.01, r=0.999). Larose et al. (2003) found that there was a positive correlation between duration of using the Internet and depression [15]. Kimberly Young and Rodgers studied the relationship between depression and Internet dependence and found that the relationship was significant [17]. The relationship between depression and Internet dependence is a function of the purpose of using the Internet. For instance, Selfhout et al. (2009) studied 307 adolescents in terms of using the Internet for communicational and non-communicational purposes and its relationship with depression, social anxiety, and quality of friendship relationships. They reported that the subjects who used the Internet for communicational purposes experienced less depression comparing with those who used the Internet for non-communicational purposes. That is, depression and social anxiety were higher in the subjects who used the Internet for non-communicational purposes [27]. It is notable that the Internet, in some cases, is used for decreasing depression. In short, prevalence of depression in the subjects was higher than Internet dependence, which means depression could a reason for higher tendency to use the Internet in the student. Using the Internet leads to dependence when it is not purposeful. Although, the cross-sectional nature of the study makes it unsuitable to make a definite conclusion that using the Internet leads to depression, the relationship between the two variables indicates that the two issues can be correlative. Therefore, it would be more helpful to check Internet dependence in the students with depression and vice versa.

**Limitations**

The study was carried out as a descriptive correlative work and it is not possible to explain the relationship between the variables based on cause-effect relationships.

**Conclusion**
There was a high rate of depression in the students. There was also a significant relationship between depression and Internet dependence. Therefore, Internet dependence should be screened in the students with depression to determine if consultation or medical interventions are needed.

References:

Investigating the Relation between Anxiety, Stress, Depression and Hemodialysis Adequacy in Patients Hospitalized in Hemodialysis Center of Dezful Grand Hospital in 2014

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Abstract

Background: as the main treatment of chronic renal failure hemodialysis is associated with numerous different psychosocial problems for patients. Depression, anxiety and stress are among these mental disorders.

Objectives: This study aimed to determine the relationship between stress, anxiety and depression with dialysis adequacy in hospitalized patients.

Patients and Methods: This is a descriptive and analytical study that was conducted on 78 patients that were selected using convenience sampling method. To determine the hemodialysis adequacy (URR, KT / V) scale and to evaluate the level of anxiety, depression and stress DASS21 questionnaire was used. Finally, data were analyzed using SPSS version 16.

Results: 75 patients (30 females and 45 males) entered the study. 44% of the studied individuals (63.6% of men and 36.3% women) according to KT/V criteria, and 36% (66.6% of men and 33.3% of women) according to standard URR had adequacy of dialysis. No significant relationship was observed in terms of age and sex between the KT/V and URR (P<0.05). The prevalence of depression in patients was found 54.6% (53.6% in men and 46.3% in women), anxiety 66.7% (50.3% in men and 49.7% in women) and stress 58.7% (54.9% in men and 45.1% in women). There was a significant relationship between the rates of depression, anxiety and stress, with KT/V and URR (P <0.05).

Conclusion: Given the inverse relationship between depression, anxiety and stress in patients and dialysis adequacy it is suggested that counseling centers and mental health centers are created or strengthened to reduce these disorders.

Keywords: dialysis adequacy, depression, anxiety, stress

Background

Today, chronic kidney disease is a growing problem that affects about 10 percent of the world’s population (1). Chronic renal failure is at the forefront of kidney problems as a health problem, as Turkish Society of Nephrology reported in 2010, almost 62 903 patients with kidney failure exist that 49,505 of them are receiving hemodialysis (2). The End stage renal diseases ((ESRD) is the most advanced stage of renal failure, in which the irreversible loss of kidney is observed. The main treatments of ESRD include kidney transplant and temporary treatment, that due to limitations of kidney transplant, hemodialysis is the most common method of treatment around the world (3).
Although hemodialysis increases survival of patients with ESRD, however, it can lead to psychological problems such as depression (4). Patients who are treated with hemodialysis show a higher rate of anxiety and stress than patients who receive peritoneal dialysis, because undergoing hemodialysis is associated with limiting daily activities and loss of independence, and increases the desire for suicide in these patients (5). Depression is also proposed as the most common psychiatric illness among dialysis patients and its prevalence is reported 1.1±15 among men and 1.8-23 among women (6). Studies report the prevalence of depression in patients with chronic kidney disease using Beck questionnaire about 20-25 percent (7). Cukor in 2013 stated the rate of clinical anxiety has been up to 45% (8). Although proving the effects of depression and anxiety on hospitalization and mortality rates of dialysis patients is difficult but Kimmel et al. (2000), conducted a cohort comprehensive analysis on patients that filled out Beck Depression Inventory every six months, this analysis showed a significant relationship between the intensity of depression and mortality in dialysis patients (9).

At the same time improving the adequacy of hemodialysis reduces mortality from chronic renal failure (10). Adequacy of Dialysis can be effective on survival, quality of life, complications of dialysis, and also the length of staying in hospital (11). Currently, the most common measures of dialysis adequacy include URR: urea reduction ratio, and kt/V where K is the clearance dialyzer (ml/min), T dialysis time (min), and V is the volume of distribution urea (12).

According to the policies of kidney Disease Outcomes Quality Foundation (KDOQI), in KT/V method the minimum effective dose of dialysis for patients who are on dialysis twice or more a week is 1.2, and according to URR the minimum effective dose for dialysis patients who are on dialysis less than 5 hours per session is 65% (13). The evaluation of hemodialysis adequacy is one of the key factors in country’s healthcare system services, however, even in some European countries the dialysis centers does not calculate the KT/V (14).

There are several references that point to the relationship between some of the symptoms caused by inadequate dialysis such as mortality and morbidity with depression and anxiety (15). Given the prevalence of mental disorders among hemodialysis patients as well as the possible impact of the disorder on the adequacy of hemodialysis, this issue is probably correlated with patient survival. On the other hand, due to unawareness of health care system from the impact of mental health on improving the patients, this study aimed to determine the relationship between stress, anxiety and depression with dialysis adequacy in hemodialysis patients in Dezful Grand Hospital in 2014.

Patients and Methods

This study is a descriptive and cross-sectional study with a sample size of 75 patients who were selected by convenience sampling. The population consisted of all hemodialysis patients who were admitted to the hemodialysis center of Dr. Ganjavian Hospital in Dezful. Inclusion criteria included permanent membership in the list of dialysis center, at least 18 years of age, no history of mental illness, doing dialysis at least twice a week. The exclusion criteria consisted of consuming anti-anxiety and anti-depression drugs, pregnancy and lack of received previous training in the control and treatment of anxiety, stress and depression. In order to remove emergency and acute renal failure cases, dialysis patients over the past three months were chosen. Kidney dialysis patients to remove their holidays in the second session of the week were examined. After obtaining written informed consent, the demographic information including age, gender, onset of dialysis, the number of hours of dialysis per week, duration of dialysis session in hours and minutes, the weight before and after dialysis, BUN before and after dialysis was collected using questionnaire. In order to assess dialysis adequacy two criteria of KT/V and URR were used. It should be noted blood samples were taken 15 minutes after dialysis cutoff and turning off the pump. The KT/V and URR were calculated according to the formula in Table 1.

Adequacy of dialysis in this study was applied to the KT/V greater than or equal to 1.2 or URR greater than or equal to 65% (16).

Anxiety, stress and depression were assessed based on DASS_21 questionnaire taken from psychological, personality and mental health test book. The questionnaire contains 21 questions that each of the subscales of this questionnaire includes 7 questions, the final score of each subscale is obtained by summing the total scores of all
questions. Each questions is scored from zero (does not apply at all in my case) to 3 (completely true in my case). Because this scale is the short form of original questionnaire (42 questions), the total score of each of these subscales should be doubled then by referring to Table 2 the severity of symptoms can be determined (17).

Henry & Crawford validated DASS21 questionnaire in their study on 1794 people English in 2005. Cronbach's alphas of the scale, as well as three subscales of depression, anxiety and stress, were reported 0.93, 0.88, 0.82, 0.90, respectively (18). The validity and reliability of the questionnaire was also confirmed by Aqebati, Moradi-Panah et al. in Iran (19). Data were analyzed using SPSS version 16 and two methods of descriptive statistics and inferential statistics including Pearson correlation test and ANOVA.

Results

The findings of this study showed that among 75 patients in this study, 30 patients (40%) were female and 45 (60%) were male. The age range included 3 patients (4%) under 30 years, 10 patients (13.3%) 30 to 39 years, 14 patients (18.7%) 40 to 49 years and 48 patients (64%) 50 years and older. In addition, 31 patients also had chronic renal failure and diabetes, 28 patients had only chronic renal failure, and other diseases were diagnosed in 16 people in addition to chronic kidney failure.

44 % of subjects (63.6 men and 36.3 women) had dialysis adequacy according to the KT/V criteria and 36% (66.6 men and 33.3 women) according to URR criteria (Table 1). Mean of KT/V was generally 1.13±0.33, while this average in patients with diabetes was 1.12±0.36, the patients with only chronic renal failure 1.14±0.25, and patients with other diseases was 1.17±0.41. Also, the highest rating index KT/V was 2.37 and the lowest score was 0.43. Also, based on the URR index, the average was 59.9% in general and 60.7% in patients with diabetes, 59.9% in chronic renal failure and 58.9% in other diseases.

The findings showed the prevalence of depression 54.6% (53.6% in men and 46.4% in women), anxiety 66.7% (50.3% in men and 49.7% in women) and stress 58.7% (54.9% in men and 45.1% in women). Other information related to anxiety, stress and depression are mentioned in Table 3.

ANOVA test showed the statistical difference of anxiety, stress and depression in terms of type of diseases (diabetes mellitus, chronic failure, other diseases) is not significant (F = 2.602), i.e. there was no significant correlation between type of disease and anxiety, stress and depression.

Pearson correlation test showed no significant relationship between age and KT/V P = 0.64) (r = -0.054); as well as between age and URR (P = 0.25) (r = -0.134). Spearman test did not show a statistically significant relationship between gender with the KT/V (P = 0.31) (r = -0.118) and gender with URR (P = 0.09) (r = -0.192).

Generally, Pearson correlation test did not report a statistically significant relationship between anxiety (P = 0.23) (r = -0.138), depression (P = 0.28) (r = 0.124) stress (P = 0.46) (r=0.086) with age.

Also, the independent t-test did not show a significant difference in terms of KT/V and URR and depression, anxiety and stress among women and men.

The results of Pearson correlation test, the relation between depression (P = 0.003) (r = -0.339), anxiety (P = 0.001) (r = -0.436) and stress (P = 0.04) (r = -0.228) with KT/V; and between depression (P = 0.03) (r = -0.247), anxiety (P = 0.03) (r = -0.246) and stress (P = 0.04) (r = -0.237) with URR index was significant and inverse.

Discussion

This study showed dialysis adequacy, was effective only in 44% of subjects according to KT/V (KT/V> 1.2), and effective in 36% of subjects based on URR (URR> 65%). This figure was 34.8% according to KT/V and URR in the study by Hashemi et al. that was conducted in 2014 in Shirvan, which is lower than our study (20). In the study by Abbas et al. (11) that was conducted in 2014 on patients in a hemodialysis center in Palestine, 39.1% had adequate dialysis according to the KT/V and 34.4% according to URR criterion. This result indicates better adequacy of
dialysis in the studied center compared to other centers; however it is lower than the global level. It is thought that the causes of low efficiency of dialysis may be the inadequate time and number of sessions of dialysis per week, the use of non-standard filter and inadequate pump revolutions. Results showed that depression exists in 54.6% of subjects, anxiety in 66.7% and stress in 58.7%; and men are more depressed than women in our study and have more anxiety and stress, although this difference was not statistically significant. Hashemi et al. reported this value as 39.2% (20). Bautovich et al. (1) in a review study in 2014 concluded that the prevalence of depression in kidney patients is 20.3%. Also in the study by Stasiak et al. that was conducted in Brazil, the prevalence of depression and anxiety in hemodialysis patients is reported 22.6% and 25.7%, respectively which is lower than present study (5). In the study by Greenwood et al. on 131 patients, depression prevalence is reported as 29% (21). Hosseini et al. reported the prevalence of depression and anxiety at 67 and 69.3 percent, respectively (22). High levels of anxiety, stress and depression in the center examined in our study could indicate a lack of attention to mental issues of patients. The reasons for anxiety and high stress and depression in dialysis patients can be related to complications beside dialysis such as diabetes and high blood pressure. As in this study, diabetic patients were more depressed. Another reason for the high rate of depression and anxiety in these patients is the incurable and sexual problems; as in the study by DIKICI et al. in 2014, a positive correlation between anxiety and sexual dysfunction were reported in hemodialysis patients (23). Of course, the prevalence of these disorders can be described with cultural and social issues.

On the other hand, mental disorders are more prevalent among men compared to women because in the Iranian culture the financial responsibility of the family is on the man and hemodialysis limits the physical activities and doesn’t practically allow them to work physically; thus, in the resulting financial dependence men show more mental disorders.

This study showed that there is a statistically significant inverse relationship between depression, anxiety, stress, and dialysis adequacy (KT/V and URR), those who have more dialysis adequacy experience less depression, anxiety and stress. This is consistent with finding of Hashemi et al. that was conducted on 42 patients undergoing dialysis (20). In the study by Hosseini et al. in 2003, a significant relationship between depression and anxiety with some effective markers of dialysis adequacy such as blood pressure, weight and creatinine concentrations was shown (22). This result could be due to the direct effect of small molecules such as ammonia and urea and calcium in nerve transfer. However, this argument is only a theory but it is incredibly controversial and needs further research in this field.

The study also did not show a significant association between emotional protests with disease, while in a study of Hosseini et al., patients with diabetes and hepatitis C had significantly more anxiety and stress (22). This can happen because of certain mental circumstances of the patients.

This study showed no statistically significant relationship between age and sex with dialysis adequacy. In a study by Abbas et al. there was no statistically significant difference between dialysis adequacy of men and women (11). While in some other studies dialysis adequacy of men has been reported lower than women (24, 25). This could be due to physiological and psychological differences between men and women.

Our research findings did not show a significant relationship between anxiety, stress and depression with age and sex of the subjects. In the study of Sanavi et al. also no significant relationship between age and sex with depression was found; that is consistent with our study (4). While Ahmazadeh et al. conducted a study in 2011 in Isfahan and found that behavioral disorders increase with age (26). This could be due to the particular situation of the elderly when faced to this disease, and also the fact that these people are touchier compared to the others.

**Conclusion**

Based on the results obtained in this study, dialysis adequacy in this center less than the standard rate. Therefore, it is recommended that the adequacy of hemodialysis for the patients is continually evaluated and try to improve it.

It was also found that anxiety, stress and depression in these patients are very high as a result, implies the need for psychiatrists or psychologists in dialysis centers. Although in this study the relationship between stress, anxiety and
depression with dialysis adequacy was significant, but the need for further research in this area is felt. Therefore, it is suggested to other researchers to study about other factors affecting the adequacy of dialysis.

Acknowledgments

This article is extracted from approved project of Dezful University of Medical Sciences and ethical number DURS116. The researchers are bound to express the utmost thanks and appreciation for financial and moral support from Dezful University of Medical Sciences, the entire patients and personnel and management of the hemodialysis Centre of Dr. Ganjavian Hospital of Dezful and all those who helped us in conducting this research project, as well as Mr. Ehsan Bahrampourn for statistical advice.

References


**Table 1:** formula related to the adequacy of hemodialysis.

<table>
<thead>
<tr>
<th>URR</th>
<th>BUN1-BUN2/BUN1</th>
<th>BUN1=before dialysis session</th>
<th>BUN2=after dialysis session</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>KT/V</strong></td>
<td>-ln(R -0.008*t) + (4 – 3.5R) +UF /V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ln= Negative natural logarithm
- R= After dialysis BUN / pre-dialysis BUN
- T= Dialysis duration in hours
- UF= Weight reduction (kg) during dialysis
- W= weight (kg) after dialysis

**Table 2:** the intensity of each subscale

<table>
<thead>
<tr>
<th></th>
<th>Natural</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Very severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>0-4</td>
<td>5-6</td>
<td>7-10</td>
<td>11-13</td>
<td>+14</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0-3</td>
<td>4-5</td>
<td>6-7</td>
<td>8-9</td>
<td>+10</td>
</tr>
<tr>
<td>Stress</td>
<td>0-7</td>
<td>8-9</td>
<td>10-12</td>
<td>13-16</td>
<td>+17</td>
</tr>
</tbody>
</table>
COST-EFFECTIVENESS OF SPINAL ANESTHESIA VERSUS GENERAL ANESTHESIA IN CESAREAN SECTION

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Abstract

Introduction: Spinal anesthesia (SA) and general anesthesia (GA) are two anesthetic procedures that used in Cesarean section surgery. Postoperative direct cost and effectiveness of each are different. The aim of this study was to compare the cost-effectiveness between Spinal anesthesia and general anesthesia in cesarean section.

Methods: The study included 120 patients with caesarian section. These patients divided into patients with spinal anesthesia (n=60) and general anesthesia (n=60). Data of direct hospital costs were gathered using medical record and hospital information system (HIS). Effectiveness of anesthesia methods was assessed by Heidelberg questionnaire (a valid tool to assess satisfaction after Cesarean section).

Results: The average cost of spinal anesthesia was lower than that of general anesthesia (21080583 vs. 23197530 Rails; P=0.002). The costs of the surgical services and the anesthesia services were the main costs for two methods of cesarean section. There was a significant difference between the two groups in the costs of operating room drugs, operating room consumable goods, and the hospital beds, nursing services, sonography (P<0.05). The effectiveness (satisfaction after the surgery) under spinal anesthesia was more than that of general anesthesia (77.65 vs. 66.71; P=0.001). The cost effectiveness rate was about 193505 Rails and the results of the one-way sensitivity analysis showed that a 15% increase or decrease in the total costs of general and spinal anesthesia would not lead to a significant change in the cost effectiveness results of two methods.

Conclusion: The present study showed that cesarean section under spinal anesthesia was more cost effective than cesarean section under general anesthesia.

Keywords: Cesarean section, General anesthesia, Spinal anesthesia, Direct cost, Cost-Effectiveness.

INTRODUCTION

Over the past several years an increase in cesarean sections has occurred all over the world (1). In worldwide, the rate of cesarean section which was 6.7% in 1990 rose up to 19.1% in 2014, which represents a 12.4 percent growth. In Iran the rate of cesarean section has increased from 16% to 60% in 2014 (2). According to a study in Iran, cesarean section was 2 to 3 times higher than the global standard (10%-15% of total normal deliveries) (3). One of the major risks in cesarean section is anesthesia methods. Anesthesia after cesarean section is responsible for 10% of mother's mortality and it is the sixth cause of death in the United States of America (4). Based on various studies cesarean section can be done by two methods: general anesthesia and spinal anesthesia. General anesthesia is conducted using a variety of drugs, analgesics, anxiolytics and anesthetics. Spinal anesthesia and general anesthesia are common methods for cesarean section, both of which are effective and reliable for cesarean section. Spinal anesthesia is simple and low side effect method in the elective cesarean sections spinal anesthesia was used, but in emergency cases general anesthesia is a better method (5). Spinal anesthesia method
recently has gained popularity for elective cesarean section (6). In cesarean sections for patients with severe airway disorder, a history of malignant hyperthermia and severe asthma, spinal anesthesia is required (7). Cesarean section procedure with different methods of anesthesia includes deferent costs and resources. Various studies have showed that spinal anesthesia is a more cost effective method in cesarean section, hernia and cholecystectomy (8, 9).

The cost effectiveness is a useful and the most common economic technique. This type of study is very important for health managers in decision making and prioritizing the health-related programs and interventions. Cost effective analysis can be used for different kinds of health programs that have the same implications. In this kind of economic analysis, we measure the costs with monetary units and the health implications with natural health units which show the health improvements such as treated cases or decreased blood pressure.(10). There are a lot of methods to measure the effectiveness of health and medical interventions. For example, the quality of life index (QL index) is used to measure the effectiveness. In this study, we used the patient satisfaction scale to assess effectiveness of anesthesia method (11, 12, 13, 14). The aim of this study was to compare the cost-effectiveness between spinal and general anesthesia in cesarean section.

METHODS

In this is cross-sectional and cost-effectiveness study, 120 women underwent caesarian section surgery were assigned to have spinal anesthesia (SA) (n=60) or general anesthesia (GA) (n=60). These patients were hospitalized in two general hospitals (Nezam Mafi hospital and Ganjavian hospital) in Kuzestan, Iran. In this study, patients with the lack of psychological, medical and midwifery problems, age of 20 to 45 years, having prenatal care record and having second or more elective cesarean indications were included into study. Data including inpatients’ costs, out patients’ costs, and demographic characteristic of patients was collected in a 6 month period retrospectively using medical records and hospital information system (HIS). We considered only direct costs to calculate patients’ costs. We used a bottom-up approach to calculate inpatient and outpatient costs. Direct hospital costs were included drugs, anesthesia services, surgeon payment, operating room consumables materials, nursing services, sonography, radiology, pathology, diagnostic tests. The direct outpatient costs including the costs of pediatrician visit, gynecologist visit, medicine, laboratory tests, travels and so on were added to the direct costs of the patient. To measure the effectiveness of anesthesia methods, 24 hours after applying spinal anesthesia or general anesthesia, the patients were given a questionnaire designed to evaluate their satisfaction with the anesthetic services (based on Heidelberg questionnaire). Validity and reliability of tools was confirmed according to the previous studies (15,16). The two groups were asked for their opinions about the type of anesthesia they had received. This questionnaire includes 24 questions and various dimensions to assess the patient's satisfaction specifically. These dimensions include: waiting time to obtain informed consent, waiting time to visit anesthesiologist, fear of anesthesia and surgery, complications of the two kinds of anesthesia, sore throat and husky voice, having nausea and vomiting, having a sense of urgent urination and feeling cold and chill. The responses were ranked based on four- point Likert scale from 1 to 4 (High, medium, low, never). The average scores for the two patients’ groups, was considered as the effectiveness of the two methods of anesthesia. Finally, the incremental cost-effectiveness ratio (ICER) was calculated using following formula:

\[
\text{ICER} = \frac{\text{Cost } A - \text{Cost } B}{\text{Effectiveness } A - \text{Effectiveness } B}
\]

To reduce the computational errors and increase the accuracy of calculation, one-way sensitivity analysis was applied to determine the effect of cost changes on the results of the equation. All of the costs were counted in Rails monetary unit. Also, the costs were converted to US dollar ($) on the basis of the inflation rate of the study year.

RESULTS

The median of length of stay in general anesthesia group and spinal anesthesia group was 2 days and 3 days respectively. According to table 1, there was a significant difference between the average of the total hospitalization costs in the two patients’ groups of general anesthesia and spinal anesthesia (21344073 ± 4171828 Rail VS. 19716589 ± 2982099 Rail; P=0.002). The highest unit cost was related to surgery services and anesthetist and surgeon fee. There was a significant difference between the two patients’ groups in the costs of operation room drugs and consumables goods, hoteling (bed day), nursing services, laboratory tests, and sonography (P<0.05).
Table 1 - The average of the inpatient direct costs in the patients underwent spinal (n=60) and general anesthesia (n=60)

<table>
<thead>
<tr>
<th>Service</th>
<th>General anesthesia (Mean ± SD)</th>
<th>Spinal anesthesia (Mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation room drugs</td>
<td>448155 ± 80067</td>
<td>296854 ± 55730</td>
<td>0.001</td>
</tr>
<tr>
<td>Operation room consumable goods</td>
<td>1534534 ± 299603</td>
<td>1363394 ± 140578</td>
<td>0.001</td>
</tr>
<tr>
<td>Drug and consumables goods of inpatient department</td>
<td>1610482 ± 743038</td>
<td>1368689 ± 655849</td>
<td>0.06</td>
</tr>
<tr>
<td>Hoteling</td>
<td>3130050 ± 2078541</td>
<td>2396003 ± 989426</td>
<td>0.015</td>
</tr>
<tr>
<td>Baby bed</td>
<td>2107946 ± 497110</td>
<td>2107913 ± 715471</td>
<td>0.99</td>
</tr>
<tr>
<td>Baby visit</td>
<td>701556 ± 180130</td>
<td>700700 ± 216056</td>
<td>0.98</td>
</tr>
<tr>
<td>Nursing services</td>
<td>289758 ± 128522</td>
<td>346496 ± 94038</td>
<td>0.007</td>
</tr>
<tr>
<td>Laboratory test</td>
<td>223229 ± 314893</td>
<td>111605 ± 83620</td>
<td>0.009</td>
</tr>
<tr>
<td>Surgeon's share</td>
<td>5191340 ± 131216</td>
<td>5174400 ± 0.001</td>
<td>0.329</td>
</tr>
<tr>
<td>Radiology</td>
<td>16216 ± 82050</td>
<td>7312 ± 34739</td>
<td>0.44</td>
</tr>
<tr>
<td>Sonography</td>
<td>175926 ± 628207</td>
<td>12889 ± 76819</td>
<td>0.04</td>
</tr>
<tr>
<td>Recovery services</td>
<td>93970 ± 11927</td>
<td>92400 ± 0.001</td>
<td>0.31</td>
</tr>
<tr>
<td>Other costs</td>
<td>458035 ± 366975</td>
<td>429624 ± 306583</td>
<td>0.64</td>
</tr>
<tr>
<td>Total mean cost</td>
<td>21344073 ± 4171828</td>
<td>19716589 ± 2982099</td>
<td>0.002</td>
</tr>
</tbody>
</table>

According to table 2, the average of surgery fee was no significant difference between the two groups (P=0.319). But the average of anesthesia fee was significant deference between the two groups (P=0.001). The mean cost of anesthesia fee in general anesthesia group was higher than spinal anesthesia group (1683200 ± 142955 vs. 1607760 ± 0.001).

Table 2 - The average of the surgery and anesthesia fee costs in the two patients groups

<table>
<thead>
<tr>
<th>Service</th>
<th>General anesthesia (n=60) (Mean ± SD)</th>
<th>Spinal anesthesia (n=60) (Mean ± SD)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical procedure fee</td>
<td>3679676 ± 161000</td>
<td>3700550 ± 35244</td>
<td>0.319</td>
</tr>
<tr>
<td>Anesthesia procedure fee</td>
<td>1683200 ± 142955</td>
<td>1607760 ± 0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

According to table 3, there wasnt a significant difference in the average of the total outpatient direct costs between the general anesthesia group and the spinal anesthesia group (P=0.05). The average of the total outpatient direct costs in general anesthesia was 1,853, 457 Rail and in spinal anesthesia it was 1,364, 264 Rails. The highest cost of outpatient treatment in the two groups was related to medicines (519783 ± 619758 Rails vs. 343350 ± 351564 Rails; P=0.05). A significant difference there was between the two patients’ groups in the costs of the gynecologist visit cost and the pediatrician visit cost, but no significant difference was found between the two patients’ groups in the cost related to the outpatient laboratory tests, outpatient’ medicines, and travel services.
Table 3- The average of the outpatient direct costs in the two patients’ groups

<table>
<thead>
<tr>
<th>Outpatient direct unit costs</th>
<th>General anesthesia (Mean± SD)</th>
<th>Spinal anesthesia (Mean± SD)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gynecologist visit</td>
<td>287233 ± 217405</td>
<td>192166 ± 130965</td>
<td>0.004</td>
</tr>
<tr>
<td>Pediatric visit</td>
<td>332500 ± 287264</td>
<td>106416 ± 149714</td>
<td>0.001</td>
</tr>
<tr>
<td>Drugs</td>
<td>519783 ± 619758</td>
<td>343350 ± 551564</td>
<td>0.05</td>
</tr>
<tr>
<td>Laboratory tests</td>
<td>381700 ± 236413</td>
<td>343000 ± 182146</td>
<td>0.31</td>
</tr>
<tr>
<td>Travel</td>
<td>168166 ± 228276</td>
<td>105666 ± 161270</td>
<td>0.08</td>
</tr>
<tr>
<td>Other Costs</td>
<td>174075 ± 478531</td>
<td>273666 ± 1551985</td>
<td>0.63</td>
</tr>
<tr>
<td>Total mean cost</td>
<td>1853457 ± 1242896</td>
<td>1364264 ± 1557604</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Diagram 1 show that total mean cost (sum of total inpatient mean cost and total outpatient mean cost) per patient in patient under general anesthesia procedure was higher than spinal anesthesia procedure significantly (23197530±4171828 vs. 21080583±2982099 Rial; P= 0.002)

Diagram 1- Comparison of total mean cost per patients in patients under general anesthesia (GA) and spinal anesthesia (SA)

TC= TOC (total outpatients mean cost) + TIC (total inpatients mean cost)

According to the results of this study, the two groups showed a significant difference in many items of satisfaction questionnaire. Total average score of patients’ satisfaction in patients underwent spinal anesthesia was higher than general anesthesia (77.65± 9.91 vs. 66.71± 8.4; P=0.001) (Diagram 2).
Diagram 2- Comparison of the average scores of patient’s satisfaction after general anesthesia (GA) and spinal anesthesia (SA)

Cost-effectiveness ratio is the proportion of the total average cost to the average effectiveness. This proportion was 347.736 for general anesthesia and 271.482 for spinal anesthesia; therefore, spinal anesthesia procedure was more cost-effective than general anesthesia after cesarean section. The incremental cost-effectiveness ratio (ICER) was about 193505. This is meaning that increase each unit of patient’s satisfaction (effectiveness) equal to 193505 Rails (Table 4).

$$ICER = \frac{Cost A - Cost B}{Effectiveness A - Effectiveness B} = \frac{23197530 - 21080583}{66.71 - 77.65} \approx 193505$$

Table 4- Cost effectiveness rate and incremental cost-effectiveness ratio (ICER) of two anesthesia methods

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Total cost</th>
<th>Effectiveness</th>
<th>C/E</th>
<th>ICER</th>
</tr>
</thead>
<tbody>
<tr>
<td>General anesthesia</td>
<td>23197530</td>
<td>66.71</td>
<td>347736</td>
<td>193505</td>
</tr>
<tr>
<td>Spinal anesthesia</td>
<td>21080583</td>
<td>77.65</td>
<td>271482</td>
<td></td>
</tr>
</tbody>
</table>

According to table 5, the results of the one-way sensitivity analysis showed that with a 15% decrease or increase in the total cost no considerable change would occur in incremental cost-effectiveness results, therefore, our calculations were not sensitive to cost variations (± 15%).

Table 5- One-away sensitivity analysis according to ±15% of total cost

<table>
<thead>
<tr>
<th>anesthesia Group</th>
<th>Original results</th>
<th>15% increase in total cost</th>
<th>15% decrease in total cost</th>
<th>Sensitivity rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>23197530</td>
<td>26677159</td>
<td>19717901</td>
<td>0.2</td>
</tr>
<tr>
<td>Spinal</td>
<td>21080583</td>
<td>24242670</td>
<td>17918496</td>
<td>0.2</td>
</tr>
<tr>
<td>ICER</td>
<td>193505</td>
<td>222530</td>
<td>208029</td>
<td>-</td>
</tr>
</tbody>
</table>

DISCUSSION

Economic evaluation through comparing the costs and the consequences of different health interventions provides the requisite information for prioritizing the health interventions and optimizing the allocation of
resources (17). In these studies, all costs of interventions including total outpatient and inpatient direct and indirect costs should be carefully calculated and also the effectiveness of them should be measured in a proper way (18). In current study, the cost analysis of the two anesthetic interventions showed that the average of the total inpatient direct costs (hospitalization cost) with general anesthetic was higher than spinal anesthesia, and this difference was statistically significant. Also according to the results, the average total cost of the outpatient services was higher in general anesthesia than in spinal anesthesia. Out of the direct costs of inpatient services, the costs of operating room drugs, operating room consumables goods, hospitalization, nursing services, laboratory tests, sonography and the anesthetist’s share were meaningfully different between the two patients groups under anesthesia. All the unit costs in general anesthetic method (except the cost of nursing services) were more than spinal anesthetic method. Imbelloni et al. reported that the cost of the spinal anesthesia was significantly lower than that of the general anesthesia (19). Also, according to the results, most of the outpatient costs in the two anesthetic methods dedicated to the drugs. Various studies showed that the direct and indirect costs and the total cost incurred by general anesthesia were more than spinal anesthesia. Using spinal anesthetic method resulted in reducing the medical costs. Also, the patients in spinal anesthesia group needed fewer drugs to control pain after surgery and also showed that the satisfaction score in spinal anesthesia group was meaningfully higher than in general anesthesia group (20).

According to this study, the costs of the operating room drugs and consumables goods in spinal anesthesia group were less than general anesthesia group. A study showed that the total cost of spinal anesthesia was lower than general anesthesia and the medicine costs and the providers fee in spinal method were lower as well (21). In comparison with spinal anesthesia method which it was used only one type of anesthetic drug, in general anesthetic method was used more drugs. Also, spinal anesthesia include shorter anesthesia duration, decreased nausea, antiemetic and analgesic requirements, and fewer complications also in study showed that spinal anesthesia was as safe and effective as general anesthesia for patients undergoing lumbar laminectomy (22)

The median of length of stay in patients with general anesthesia and spinal anesthesia was 2 days and 3 days respectively. Neuman et al. showed that regional anesthesia was associated with a 0.6-day shorter length of stay than general anesthesia (23). A study showed that the general anesthesia was associated with slightly increased operating time and a shorter LOS in patients with a fracture of the hip (24). The result of this research showed that the amount of pain in the surgery area after operation and also the pain in the areas of the head and the back in spinal anesthesia was lower than in general anesthesia (just 18.3% of the patient with spinal anesthesia method reported pain). A study showed that the post-operative pain after spinal anesthesia was less than the pain after general anesthesia, and the patients with spinal anesthesia had shorter length of stay (25). According to the results of the present research, the rate of sore throat and coughing in general anesthesia group was more because of the endotracheal tubes used to deliver oxygen to the patients (26). Based on the present study, the incidence of nausea and vomiting was not meaningfully different in the two groups. The present study showed that the average patient’s satisfaction score of the spinal anesthesia group was significantly more than the general anesthesia group (P=0.001). Finally, Spinal anesthesia method was more cost-effective than general anesthesia after cesarean section. Mehrabi et al. reported that spinal anesthesia with combined bupivacaine and fentanyl is a safe, effective, and cost-effective method for performing PCNL in adult patients (27). Effective, low cost, and successful surgery can be performed using an effective and safe anesthesia type.

CONCLUSION

According to the results of this study, the cost of cesarean section under spinal anesthesia was less than the cost of cesarean section under general anesthesia.

Also the amount of pain in the surgery area, headache, backache and sore throat was lower in spinal anesthetic method than in general anesthetic method. Both groups had no meaningful difference in terms of nausea and vomiting after surgery. The general anesthesia group reported more respiratory problems after the operation than the spinal anesthesia group. Consequently, spinal anesthesia was a more cost-effective strategy for cesarean section surgery.

ACKNOWLEDGMENTS

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Conflict of Interest: none declared
REFERENCES

3. Moayed MS, Sohrabi Z. Do anticipate an increase in the cesarean rate has been realized? Payesh 2008; 11: 271-6. [In Persian]

The effect of home self-care on quality of life in hemodialysis patients who are referred to Bu Ali educational and treatment center, Ardabil, Iran

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Abstract

Background and Goal: Due to development and complications of chronic diseases such as chronic renal failure, the quality of life is often lower than normal for the patients and the complications of disease will be more controllable by patient and his/her family comprehension about the treatment process and new patient education methods by nurses. This study is designed and conducted to determine the effect of self-care at home on the quality of life in hemodialysis patients referred to Buali educational and treatment center, Ardebil in 2016.

Materials and Method: The present study was a quasi-experimental in which 60 male and female patients were divided in two experimental and control. The statistical society of this study age range were 18 to 65 who referred to hemodialysis ward of Buali educational and treatment center, and at least 6 months have elapsed from their first dialysis. The samples were categorized into groups with the size of 30 people. The data collection tools included a questionnaire about their demographic characteristics and another questionnaire about quality of life of KDQOL-SF of renal disease. Quality of life scores was recorded as a pre-test, and after the intervention, quality of life questionnai re was completed again as the post-test by two groups and the data were analyzed by SPSS22 software and using descriptive statistics and ANOVA methods.

Findings: After self-training at home, all dimensions of quality of life except employment, social protection and patient satisfaction were significantly increased in the experimental group (P<0.005). Also the total mean of quality of life was promoted from 43.9 percent to 53.77 percent after application of self-care at home training and showed significant difference (P<0.001). However this difference was not significant in the control group (P<0.005).

Discussion and conclusion: The results show the positive effect of self-care training at home in improving the quality of life for hemodialysis patients. Thus, it is possible to enhance the quality of life for these patients with application of method as a new training pattern.

Introduction

Chronic Kidney Disease (CKD), also known as chronic renal failure, is a progressive and irreversible disorder in kidney in which the body's ability to keep balances of fluids and electrolytes are disturbed and eventually leads to uremia. [1] Its degree of prevalence around the world includes 242 cases per million people and annually approximately 8 percent is added to this amount. [2] In Iran, the incidence of chronic renal failure included the 234.49 people per million people in 2000 which increased to 357.63 people per one million inhabitants in 2006. [3]
According to statistics from the Iranian Ministry of Health and Medical Education, in 2012 there were about 39 thousand patients with kidney failure in Iran. [4] In Iran, the development of new cases of end stage kidney failure is very high and is equivalent to 6.22% per annum so that approximately four thousand new patients are added to the number of previous patients that 98 percent of these patients undergo hemodialysis and 2% peritoneal dialysis. [5, 6] Hemodialysis is the most common treatment for end-stage chronic renal failure in Iran and around the world and has an important role in improving the lives of patients. Hemodialysis causes decrease of the symptoms and signs of chronic kidney failure, although it does not result in complete recovery of renal disease and cannot be replaced by renal function. [7] Hemodialysis patients experience several problems; most important of these problems include sleep disorders, peripheral neuropathy, infection, anemia, itching, discoloration, loss of libido, inability to concentrate and seizures; that these difficulties effect on some aspects of life in patients undergoing hemodialysis and these patients not only are faced with numerous physiological changes by it but also they are faced with many psychological tensions face, which any one of them in turn can make disturbances in their psyche and personality, so that mostly they do not adjust with problems and tensions and undergo behavior changes such as stress, anxiety, depression, isolation and the denial of the disease. [8]

Moreover, despite many progresses including hemodialysis and kidney transplantation in the treatment of chronic renal disease, reduction of quality of life is endangered as a major problem in this group of patients and often it is below the normal range. [9] Therefore, these patients need to change their lifestyle for better coping with and managing heir disease. Treatment of these patients cannot be sufficiently effective and desired results of treatment are not achieved without participation of patient and doing some self-care activities.

Therefore, training of self-care and self-efficiency is of the main priorities in this group of patients [10] because patient education is the most important success factor in kidney disease care program. Due to the nature of their chronic kidney disease which sometimes lasts to the end of patient’s life, kidney diseases will be controllable only through understanding of the patient and his family about the disease and their participation in all stages of the treatment project. Lack of understanding of the cause and nature of the disease by the patient and his family, the role of diet and sufficient consumption of medication the patient and family will undoubtedly lead to treatment failure. By providing education and awareness to the patients, they can be helped to follow an appropriate diet and treatment and the incidence of mortality and morbidity due to increased toxins in the body is reduced. Due to this training, anxiety of the patient and family is decreased and satisfaction of patient and family from the healing process is increased. [11]

Patient education can cause increase of satisfaction among clients, improvement of the self-efficacy due to improved quality of life, sureness about continuity of care, relief of patient’s anxiety, reduction of complications, increase of participation in the programs of health care and independence of clients in everyday activities. [12] On the other hand, one of the methods that can be used to train patients is to care at home. According to Lancaster, home care is the best way to provide educational programs for individual families. [13] The purpose of education to patients at home includes increase of the ability to cope with their disease, self-care and speed-up of recovery after illness and minimization of any affects. [14] Home care includes providing services related to health of patients at home and this care is an alternative service for some hospital services.

This safe procedure is acceptable for patients and their families and it costs are less than hospital services and its use causes faster return of patients to their normal lives. [15] The most complete theory of self-care is "Orem theory" that considers self-care as a regulatory function of the human kind, and defines it for providing security and maintenance of equipment and facilities necessary for the survival and maintenance of physical and mental performance and growth of a person in the normal and suitable range for life and integrity performance. [16] Some studies show that there is a relationship between depression and self-care in patients with chronic renal failure and other chronic diseases so that performance of self-care can largely reduce physical symptoms and signs and symptoms of depression in patients. [17]

Also, there is a relationship between quality of life and self-care in hemodialysis patients; in other words, the patients who follow self-care activities more than others also enjoy better quality of life. [18] Therefore, it seems that increase of the performance of self-care can increase adherence to treatment methods, reduce patient’s physical and even mental signs and symptoms such as depression and increase their quality of life. Also, due to the fact that researchers and structure professionals consider quality of life as structural and political structure and a key element in policy-making and investigation of public policies and it is known as an indicator of social development, features
of this structure such as being dynamic, multidimensional and various assumptions have caused this structure which
originally was used in the area of health, gradually be applied to other areas of studies. [19]

So, reform of quality of life not only is useful and valuable for dialysis patients but also decreases costs of health
and medical care associated with them. In other words, for the dialysis patients can care themselves well, they
should be trained sufficiently about their disease and enhance their knowledge and skills about the disease, hence
the rehabilitation and support of self-care through education is the key to control dialysis patients. [20]

In general, given that today in medical care, management of chronic diseases is of particular importance, in this
case the objective of health care, is to improve quality of life so that improvement of quality of life should be
considered as a result of medical research. Today, patients expect greater participation in decision-making about
treatment, so knowing the quality of life in these patients is of particular importance, so thereby according to the
obtained results, appropriate planning will be conducted in order to improve the quality of life of the patient. Given
that different countries and WHO have suggested some programs to reduce risk factors of non-communicable
diseases, also in Iran it is necessary to conduct appropriate experimentals to improve lifestyles and control of risk
factors of non-communicable diseases. [21]

So the nurse as one of the most important members of the health team can lead patients to life balance through
probable experimentals such as training self-care programs and directly affect their quality of life. Without training
patients and their participation in self-care, health care can be more costly and quality of life can be largely
diminished. Thus, with respect to the stated subjects, the purpose of this study is preparation of and assistance to
patients to care themselves in order to improve the quality of life and it is not possible as long as nurses can provide
a trusted relationship between nurse and patient to support and train the patient and this is achieved when the patient
is allowed to actively participate in decision-making and planning for himself. And since most people prefer their
homes to hospitals, so hemodialysis patients should be followed by nurses at home to continue care and treatment
process and rehabilitation programs, including receiving the necessary training. According to the above, this study
aimed to determine the effect of training self-care at home on the quality of life in hemodialysis patients referred to
Ardabil bu Ali’s Therapeutic and Educational Center in 2016.

Research Methodology

This is a quasi-experimental study in which the post-test and control and experimental groups were used. Population
of the study included the patients with first 6 months dialysis in Ardabil bu Ali’s Therapeutic and Educational
Center. Volume of samples of the research included 60 patients who met the inclusion criteria and were selected
through convenience sampling from the target population. Of these people, 30 patients were randomly assigned to
the experimental group and 30 patients in the control group by the same method. In the pilot researches, minimum
sample size has been reported 15 persons for each group [22] that due to increase of ability to generalize the results,
30 people were considered for each group of.

Inclusion criteria included the patients who 1) with at least two or three times a week hemodialysis were at least 6
months under hemodialysis, 2) were able to understand and learn the presented lessons, 3) had good physical
condition, 4) were willing to cooperate in the study, 5) allowed presence of the researcher at their home during the
experimental and tutorial programs, 6) did not want to transplant kidney, 7) had never seen before formal education
about self-care, and 8) aged 18 to 65 years old. Also, the exclusion criteria for this study included the patient’s
unwillingness to continue cooperation, transfer to other centers, care discontinuation due to medical reasons and
death of patient. Data collection tools included demographic questionnaire and short form questionnaire to consider
quality of life of kidney disease KDQOL–SF. This questionnaire is the most common proprietary tool to measure
quality of life for renal patients and for the first time it was standardized in 2012 in the United States and by Kruvar
and then it was standardized in other countries such as China, France, Germany, Italy, the Netherlands, Denmark,
Korea and Portugal and was widely tested for its validity and reliability. [23]

The questionnaire has 80 items in 19 dimensions and is composed of two parts. One part of the questionnaire
includes SF-36 which is about health in general, which includes 8 dimensions (physical functioning, limitations
caused by physical problems, limitations caused by emotional problems, bodily pain, general health perception,
social functioning, mental health, vitality, and health status compared with the previous year). The second part of the
questionnaire is related to the quality of life in relation to kidney disease which contains 11 dimensions (symptoms
and a list of problems, effect of kidney disease, burden of disease, cognitive function, quality of social relationships,
sexual function, sleep, social support, job performance, general state of health, patient satisfaction, and support staff). Score of each dimension is from 0 to 100, that a higher score indicates better quality of life. [24] To assess the reliability of the short form questionnaire of quality of life for renal patients, test-retest and intra-class correlation coefficient were used. Intra-class correlation coefficient of specific aspects of the questionnaire indicated reliable stability between two assessments with a ten days interval and correlation coefficients were from 0.77 for the physical pain dimension to 0.92 for symptoms and problems dimension. However, the intra-class correlation dimension of the general dimensions in the questionnaire ranged from 0.79 to 0.92.

Also, to internally measure the dimensions of the questionnaire, Cronbach's alpha was used. Cronbach's alpha coefficient for the specific dimensions of the questionnaire ranged from 0.71 for the working conditions dimension to 0.96 for sexual function dimension. Cronbach's alpha for the general aspects of the questionnaire, ranged from 0.73 for freshness and vitality to 0.93 for the physical function. [25] In the present study, data were collected in two phases. In the first stage, the relevant tests conducted in both groups as pre-test, and after collecting the questionnaires, the experimental group received home education for their rehabilitation. That is, one day after dialysis of patients in the hospital because of having appropriate mental preparation and physical strength to receive content, by prior arrangement it was referred to patients' homes to educate them.

The training was conducted for 4 sessions based on educational needs. Training sessions lasted almost one-hour twice a week. Educational contents were based on the needs assessment, including diet, daily body weight control, proper use of medications, adapting to new conditions of life and care of fistula etc. At the same time, the manual was given to them. But the control group was not given any training and the control group received only routine training of the unit. The second phase of research was for experimental group one month after the last training session at home, during which for the second time patients were tested with the questionnaire of quality of life of kidney patients. The control group was re-evaluated with the same forms in the hemodialysis units. Also for the benefit of the control group, after the completion of the study, they also were provided training manual. After data collection, statistical analysis was performed using SPSS version 22. T-tests were used to compare the properties of participants in two groups. Statistical analysis was performed based on the objectives of the study so that to compare of average score of investigation of quality of life for hemodialysis patients and investigation of its dimensions, ANCOVA analysis of covariance was used.

Findings

In this study, of the 60 considered patients, 30 patients were placed in the experimental group and 30 patients in the control group randomly, that the results descriptive statistics of demographic variables are as follows.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean of control group</th>
<th>Mean of experimental group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease duration</td>
<td>3.6</td>
<td>3.9697</td>
<td>0.153</td>
</tr>
<tr>
<td>Dialysis duration</td>
<td>3.733</td>
<td>3.6</td>
<td>0.887</td>
</tr>
<tr>
<td>Previous weight</td>
<td>77.3</td>
<td>73.8</td>
<td>0.363</td>
</tr>
<tr>
<td>Next weight</td>
<td>73.8</td>
<td>73.8</td>
<td>0.0001</td>
</tr>
<tr>
<td>Result of creatine</td>
<td>12.35</td>
<td>12.35</td>
<td>0.019</td>
</tr>
<tr>
<td>Result of hemoglobin</td>
<td>3.6</td>
<td>3.6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Disease history</td>
<td>3.6</td>
<td>3.6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Number of children</td>
<td>3.6</td>
<td>3.6</td>
<td>0.138</td>
</tr>
</tbody>
</table>

According to the results of the t-tests and Mann-Whitney tests, among the evaluated variables, next weight, result of creatine, result of hemoglobin, dialysis and dialysis history were not the same in the two groups. Therefore, in this study, the response variable analyses should be analyzed by considering the effect of confounding these variables.
Table 2 Frequency distribution of demographic variables between the two groups of experimental and control

<table>
<thead>
<tr>
<th>Significance level</th>
<th>Statistic rate</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>Less than 20</td>
</tr>
<tr>
<td>0.613</td>
<td>1.809</td>
<td>3</td>
<td>2</td>
<td>21-30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td>31-40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>25</td>
<td>41-50</td>
</tr>
<tr>
<td>&gt;0.9999</td>
<td>&lt;0.0001</td>
<td>15</td>
<td>15</td>
<td>male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>15</td>
<td>Female</td>
</tr>
<tr>
<td>0.052</td>
<td>5.09</td>
<td>25</td>
<td>30</td>
<td>single</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>0</td>
<td>married</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>Widow/widower</td>
</tr>
<tr>
<td>0.492</td>
<td>2.069</td>
<td>2</td>
<td>0</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>30</td>
<td>no</td>
</tr>
<tr>
<td>0.032</td>
<td>4.593</td>
<td>15</td>
<td>7</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>23</td>
<td>no</td>
</tr>
<tr>
<td>0.545</td>
<td>1.215</td>
<td>12</td>
<td>10</td>
<td>Illiterate and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>17</td>
<td>elementary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>3</td>
<td>High-school</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>university</td>
</tr>
<tr>
<td>0.371</td>
<td>0.8</td>
<td>21</td>
<td>24</td>
<td>Privately-owned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>6</td>
<td>Non-real estate</td>
</tr>
<tr>
<td>0.562</td>
<td>2.974</td>
<td>1</td>
<td>0</td>
<td>unemployed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>15</td>
<td>House-wife</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
<td>employed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>5</td>
<td>disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>5</td>
<td>retired</td>
</tr>
<tr>
<td>0.389</td>
<td>1.88</td>
<td>18</td>
<td>18</td>
<td>insufficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td>11</td>
<td>acceptable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>1</td>
<td>great</td>
</tr>
</tbody>
</table>

According to the results of Table 2, all confounding factors in both experimental and control groups were not significant, except for disease history which in both groups was significant at 0.05, which should be considered as a confounding variable in analysis of results.

According to the results of Tables (1) and (2) above, significance level of comparing two groups of control and experimental was calculated after experimental, by taking into account confounding factors and by ANCOVA test.
According to the results obtained from table 3, difference of mean of the disease symptoms score is not significant between the two groups of experimental and control before the experimental while this difference is significant between the two groups after experimental. Also, the difference between before and after experimental in two experimental and control groups is reported significant. The percentage of changes in the experimental group is 3.93 percent, while the percentage of changes for the control group is 11.29 percent. Also, mean difference of the score of kidney disease on the lives of patients between the two groups of experimental and control before the experimental is not significant. And also this difference between the two groups after the experimental is not significant. Also the difference before and after experimental in experimental group is significant whereas in the control group it is not reported significant.

Results about burden of kidney disease is in this way that the mean difference of burden of kidney disease score between the two groups of experimental and control before the experimental is significant and this difference is not
significant between the two groups after the experimental. Also, the difference is not significant before and after experimental in experimental group while in the control group it is reported significant. About job status results showed that the mean difference of employment status score between the two groups of experimental and control before the experimental is not significant and this difference after the experimental between the two groups is not significant, as well. Also, before and after experimental in control group the difference is not significant and in the experimental group it is reported insignificant. About cognitive function and social relationships quality, results suggest that the mean difference in cognitive function and quality of social relations between the two groups of experimental and control before the experimental is significant while this difference is not significant between the two groups after the experimental. Also the difference is reported significant before and after the experimental between two groups of control and experimental. Percentage of changes in the experimental group increases to 20.47% while the percentage of changes decreases to 2.83% for the control group that shows more changes due to experimental in the experimental group.

Also the mean difference in sexual function between the two groups of experimental and control before the experimental is significant while this difference is not significant between the two groups after the experimental. The difference before and after the experimental in two control and experimental groups is reported significant and percentage of changes in the experimental group increases to 34.03% while the percentage of changes decreases to 24.42% in control group. This shows more changes due to experimental in the experimental group. Results about sleep function reflects that according to the results obtained from the tables above, mean difference of sleep function score between the two groups of experimental and control before the experimental is not significant and this difference between the two groups after the experimental is not significant, as well. Also, the difference before and after the experimental in control group is not significant while in the experimental group is reported significant. Also mean difference of the score of social support between two experimental and control group before experimental is not significant and also this difference after experimental between the two groups is not significant again. Also, after and before experimental in the control group the difference is not significant and in the experimental group is reported insignificant, too.

On the other hand, mean and standard deviation of satisfaction of patient with life indicates that mean difference of the score of patient’s satisfaction with life is not significant between two groups of experimental and control before experimental and it is not significant again after experimental between the two groups. Also, the difference is insignificant before and after experimental in control group and is not reported significant in experimental group. Also, results concerning the component of general health reflect that mean difference of general health score between two experimental and control groups is not significant before the experimental whereas this difference has become significant after experimental between the two groups. Also the difference is reported significant before and after experimental in two control and experimental groups. In experimental group, percentage of changes increases 29.56% while in the control group it decreases to 4.53%.

Results indicate that more changes were because of experimental in the experimental group. Also, based on the results obtained from Table 3, difference of mean for special health score is significant between the two groups of experimental and control before experimental and this difference is significance again after experimental. Also, the difference is reported significant before and after experimental in two experimental and control groups. In experimental group, percentage of changes increases to 17.14% while in control group it decreases to 5.29% that shows more changes due to experimental in experimental group. Finally, the results regarding mean and standard deviation of the total score in both experimental and control groups indicates that the mean difference of the total health score is not significant between two groups of experimental and control before experimental while it becomes significant after experimental between the two groups. Also, the difference is reported significant after and before the experimental in two experimental and control groups. In experimental group, percentage of changes increases to 22.48% while in control group it decreases to 4.96% which indicates more changes due to experimental in the experimental group.

Discussion

Given that hemodialysis patients experience multiple problems, the most important problems include sleep disorders, peripheral neuropathy, infection, anemia, itching, discoloration, loss of libido, inability to concentrate and seizures. These problems affect the different dimensions of life quality of hemodialysis patients, and it causes not only these patients face with multiple physiological changes but also they face with many psychological stresses.
which each of them, in turn, can cause mental or personality disorders in them so that often they are not compatible with the problems and tensions and suffer from behavioral changes such as stress, anxiety, depression, isolation, and denial of diseases. Hence, teaching self-care strategies can have a significant impact on empowering them because empowerment is considered a functional strategy in health.

The results showed that there is not a significant difference between the two experimental and control groups in terms of demographic variables such as age, marital status, family history, medical history, education level, housing, employment status and income rate; in other words, the two groups were homogenous in terms of the mentioned variables. In the study of Taheri and his colleagues (1392), which examines the quality of life for hemodialysis patients, it was reported that there is a positive and significant relationship between level of education and quality of life (P = 0.003) and between the income and quality of life (P = 0.0001). [26]

Also Payab and his colleagues’ (1394) study to investigate the relationship between quality of life for dialysis patients and individual characteristics of patients referred to dialysis unit of Golpaygani Hospital in city of Qom in 1394, it was reported that there is not a significant correlation between education level and income with their quality of life, so this result is consistent with the results of this study. [27]

The results showed that overall mean of quality of life in this study increased which this indicates use of self-care education at home has a positive effect. But in other countries, scores of quality of life in hemodialysis patients are higher than in our study. For example, in the study conducted by Levendoglu in Turkey, total average of scores of life quality in hemodialysis patients was 65.75% after utilizing self-care pattern by using SF-46 scale that compared to the patients of the present study it is high. [28] These findings compared with Fujisawa (2000), in which the total average of quality of life of the patients undergoing hemodialysis was 68.38 percent, shows that the overall average of quality of life in Iran is low. [29]

In this study, except for the dimensions of "job status, social support, patient’s satisfaction with life", there was not a significant difference in other dimensions, and the results generally indicate improvement of quality of life in patients after training. In other words, it can be stated that training self-care programs in the home increases the quality of life in hemodialysis patients. This result is consistent with previous studies. For example, Narimani (1387) investigated the effect of training self-care on quality of life in hemodialysis patients and reported that due to the significant level it can be said that there is a meaningful relationship between mean of quality of life before and after training. [30]

Narvayi and his colleagues (1389) in their study considered the effect of applying the self-care model on quality of life in hemodialysis patients and reported that after the implementation of self-care pattern, all aspects of quality of life re significantly enhanced. Also, the total mean of quality enhanced from 46.90% to 56.65% after application of the self-care model and showed a significant difference. [31]

One of the motivations for conducting this research is using its results to improve the quality of patients and clients. And given that nurses are the most important and influential people in health staff, they are able to use the results of the present study to improve care services. Thus, the findings of this study could be used in the field of nursing, especially nursing hemodialysis patients because nurses with respect to their education can have the most influence on the level of self-care capability in the patients with chronic renal failure.

Finally, according to the findings of this study, it is suggested that the experimental done in a longer time and investigation of quality of life of the hemodialysis patients is implemented in two time periods: meaning firstly immediately after experimental and then in a time period with much distance. Also, it is recommended that this research will be performed in other cities and hospitals to increase the power of generalizing its results.
Reference

15- Isenberg KB, Trisolini M. Information needs and roles for family members of dialysis patients. Dialysis transplantation 2008; 37(2):50-57.
22- Delavar A. advanced research methods. 2007; publications of Science and Research. (Persian)


The Prevalence of Depression and Some Related Factors in Caregivers of Patients with Bipolar Disorder

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Abstract

Introduction: The presence of a sick person in the family usually results in depression in family members. The present study was conducted to determine the prevalence of depression and some of its determinants in the caregivers of patients with bipolar disorder.

Materials and Methods: In this cross-sectional descriptive analytical study, 45 caregivers of bipolar patients were recruited via random sampling. The participants completed the Beck Depression Inventory and a demographic questionnaire. Descriptive statistics were obtained and data were analyzed using Pearson's correlation, coefficient, ANOVA, and Duncan using SPSS version 15.

Results: The mean depression score was 33.9% in the participants and most of them had moderate depression. There was a significant inverse relationship between depression and educational level (p=0.03, r=-0.321). No significant relationship was observed between depression and the caregiver's income (p=0.4), sex (p=0.52), and marital status (p=0.56).

Discussion and Conclusion: Taking care of bipolar patients due to depression in family caregivers. Therefore, it can be said that depression imposed by such patients threatens caregivers' mental health, hence reduction in quality of care and support. Consequently, family centered programs are recommended for decreasing depression incurred by bipolar patients.

Key words: Depression, Caregiver, bipolar disorder, Demographic factors

Introduction

All experts in the fields of psychology and psychiatry believe that family is the first and most important institution in every society because it is the place where births occur. Family is in the center of attention in psychopathology and also in prevention and treatment of mental disorders because it is the principal institution for the socialization of children (1). The function of family is associated with the mental health of its members, and family aspirations and self-assertiveness are good predictors of mental health (2).

Evidence suggests that family caregivers have limited information, resources, and supports to prepare themselves for such a role. In response to mental disorder signs and symptoms and as a result of continuous and long-term care for the patient with mental health difficulties, family caregivers experience and express a great deal of sorrow, grief, loss, anger, depression, shame, tension, and combinative pressure (3).

The variety and severity of caregiving roles may result in psychological problems in family caregivers of the patients (4).
The illness of a family member affects the family system because it requires the adaptation of the patient and family members. Finally, the presence of an illness in the family results in depression in family members and their detachment from one another (5).

Previous research has found that caring for a patient exhausts the family’s energy and causes frustration, despair, depression, and development or exacerbation of psychosomatic disorders in other family members, especially the patient’s parents and spouse. Many studies have shown that the family members of mental patients usually feel weak and experience distress, anxiety, depression, and financial problems (6).

In 2010, Haresabadi et al. conducted a study to evaluate burden of family caregivers of patients with schizophrenia admitted in IMAM REZA hospital- Bojnourd 2010 and concluded that the family burden imposed by such patients threatened the mental health of the caregivers (7). The family burden, including physical, mental, psychological, social and economic experienced by caregivers (8). Treatment costs, stigmatization, family sadness for symptoms and behaviors of patients, upset of job and social roles of caregivers are the most important factors influencing patient and especially caregivers and cause of higher rate of depression in them(9,10).

In the United States, Steele et al. reported a rate of 40-50% for signs of depression and anxiety in the family caregivers of chronic psychiatric patients (11).

Omranifard et al. (2006) conducted a study exploring “Prevalence of depression and anxiety in caregivers of patients in psychiatric wards” in Noor Hospital, Isfahan. Findings have shown 71% of caregiver had depression and 7.9% affected by anxiety (12).

Today most patients with mood disorder live at home with their family and care and treatment programs will continue in the family (2). Patient caregivers are at risk for illness such as depression (13).

Psychiatric distress in samples of caregivers of persons/patients with BD was measured in few studies (14-17). Few studies measured mood symptoms in caregivers of persons/patients with BD, especially depressive symptoms (18,19,17,20).

Considering the low number of studies conducted on mental disorders, especially depression, in the affected families and the importance of statistics and information in this regard, we decided to perform this study to determine the prevalence of depression in the family members of psychiatric patients attending the Psychiatric Ward of Dr. Ganjavian Hospital, Dezful, and Shams Abad Psychiatric Hospital in 2015-2016. The results of this study could be used to enhance the care quality of the patients through acquiring more information in this regard and improving the mental health of their family members.

**Materials and Methods**

In this cross-sectional descriptive analytical study, 50 participants were approached from Psychiatric Ward of Dr. Ganjavian Hospital, Dezful, and Shams Abad Psychiatric Hospital and 45 agreed to participate. The inclusion criteria were being the main caregiver of type I bipolar inpatient according to medical records and psychiatrist diagnosis, negative history of any psychiatric diseases, and negative history of taking psychiatric medications through question about drug history, having consent to participate in the study. Exclusion criteria are so elderly caregivers who can't participate in this study, Caregivers that their patients have other mental diagnosis in addition of mood disorder or physical disorders.

A demographic questionnaire and the Beck Depression Inventory (BDI) were completed for each participant by the researcher through interview.

We used simple random sampling in this study. The participant selected among bipolar caregivers according to inclusion and exclusion criteria by use of file number of their patient. All of participants filled Informed consent form.

Demographic questionnaire consist of sex, marital status, income, educational level.
The BDI has 21 questions, each one about one aspect of the mental state. Each question has four responses, rising in intensity from the mildest to the most severe depressive symptom. Each answer is scored on a value scale of 0-3: each answer is scored on a value scale of 0-3, with scores of 0 indicating no endorsement of the depressive symptom and scores of 1, 2 and 3 implying the presence of depressive symptoms of increasing severity. If the patient marks more than one answer for a given question, only the question with the highest score is considered for the final calculation. The standard cut-off scores for determining the overall depression severity are as follows: 0-15: normal, 16-31: mild depression, 32-47: moderate depression, 48-63: severe depression (21, 22).

Most studies have shown that the BDI has a high internal consistency with a Cronbach’s alpha of 0.55-0.96, indicating its high construct validity. The Cronbach’s alpha of the BDI is 0.91 in Iran (23).

The data were analyzed with descriptive statistics, Pearson’s correlation coefficient, ANOVA, and Duncan by using the SPSS software version 12.

Results

Forty-five caregivers of bipolar patients were included in this study of whom 31.1% (n=14) were men and 68.9% (n=31) were women. Regarding the educational level, 35.6% (n=16), 22.2% (n=10), 37.8% (n=17), and 4.4% (n=2) of the participants had incomplete high school education, high school diploma, bachelor’s degree, and master’s degree, respectively. The income was less than 5,000,000; 5,000,000-10,000,000; 10,000,000-15,000,000; and more than 15,000,000 Rial (Iran’s currency) in 17.8% (n=8), 51.1% (n=23), 24.4% (n=11), and 6.7% (n=3) of the participants, respectively. Moreover, 33.3% (n=15) of the participants were single and 67.7% (n=30) were married (Table 1).

The mean BDI score was 33.9% in the participants; for 2.2% of participants, BDI scores pertained to no depressive symptoms, 35.6% had mild, 60% had moderate, and 2.2% had severe depressive symptoms.

There was a significant inverse relationship between depression and educational level (p=0.03, r=-0.321). No significant relationship was observed between depression and the caregiver’s income (p=0.4), sex (p=0.52), or marital status (p=0.56)

Table 1: Demographic characteristics

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Frequency</th>
<th>Demographic Characteristic</th>
<th>Sex</th>
<th>Marital Status</th>
<th>Educational Level</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.1</td>
<td>14</td>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68.9</td>
<td>31</td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67.7</td>
<td>30</td>
<td>Married</td>
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<td>6.7</td>
<td>3</td>
<td>and more than 15,000,000</td>
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</table>

Discussion

Living with a family member with mental health difficulties has negative impacts on the physical and mental health of the family members, and caregivers of these patients suffer psychological and mental problems like anxiety and depression (24).

The mean BDI score was 33.9% in the participants; for 2.2% of participants, BDI scores pertained to no depressive symptoms, 35.6% had mild, 60% had moderate, and 2.2% had severe depressive symptoms. Caregivers of persons/patients with BD, similar to caregivers of persons/patients with other major affective or chronic psychiatric disorders, report high levels of stress and poorer general health, increased visits to their primary care physicians, and
higher numbers of symptoms of physiological and psychological conditions, including depressed mood, when compared to caregivers who report less stress (25).

The mean BDI score was 33.9% in the participants. Steele and et al in their study shown 46% of bipolar caregivers reporting depression (11). According to Dick states Perlick said up to 40% of mental illness caregivers have depressive symptoms. He said stigma experienced by bipolar caregivers were associated with significantly higher levels of depressive symptoms (26).

The results of the present study are not in line with the results of the studies by Jordan, Solomon, Waysman, Manteghi et al, and Bahreynian et al (27-31). In the above-mentioned studies, the prevalence of mild and severe depression was higher and the prevalence of moderate depression was lower than our study. The reason for the difference could be that the studies mentioned earlier were conducted with veterans’ spouses and people with PTSD following war and as a result, injury of the husbands in the war made their wives prone to more severe forms of depression. Also the difference in the number of participants and cultural issues can be due to these differences.

The results of our study showed that the majority of caregivers were women. This finding is in line with the results of the studies conducted by Pahlavanzadeh et al (4), Zargar et al (2), Nasr et al (32), Gulseren et al (33), and Awad et al (34). In the Iranian culture, girls and women who do not work or study usually take care of children, patients, and the elderly or physically injured as part of housekeeping and housework. Studies in other societies also show that girls and women are the primary caregivers in the house. According to these studies, middle-aged women aged below 60 years comprise the majority of the caregivers, and most of the elderly patients’ caregivers are their daughters or spouses (4, 35, 36).

The results of our study showed that the prevalence of depression was lower in female caregivers than their male counterparts although the difference was not significant (p=0.52). This finding is similar to the results reported by Omranifard et al and Heru et al who found no significant relationship between depression and the caregiver’s sex (p>0.05) (12, 37).

A significant inverse relationship was found between depression and educational level (p=0.03, r=-0.321); in other words, the prevalence of depression was higher in caregivers with a lower educational level. On the other hand, studies conducted by Hingz, Janatan, and Raymond indicate that educated people have better capabilities to face stressful events, and can employ effective coping strategies to plan for, control, and manage difficult situations and seek for support with more certainty. Therefore, they have a more positive attitude and experience less mood changes (23, 38). The results of a research by Sharif et al shows that the highest and lowest prevalence of psychiatric disorders is seen in illiterate people and those with academic education, respectively (39).

We found no significant relationship between depression and marital status of the caregivers (p=0.56), which is in line with the results of the study by Rahmani et al but does not agree with a report by Amjadi et al who investigated depression in women; according to Amjadi et al, the prevalence of depression is far higher in single versus married women (p<0.001) (23). The reason for the difference could be that all participants in Amjadi's study were women who were not necessarily caregivers; however, our sample exclusively comprised caregivers, of both sexes.

No significant relationship was observed between depression and income (p=0.4). This finding is not in line with the results of other studies, and the reason for the difference could be different sampling methods and characteristics of the participants. The results of many studies indicate that income adequacy is associated with better mental health and socioeconomic indexes. Moreover, research shows that the prevalence of mental disorders is associated with low Social validity and income. A study by Nazari revealed that tension was higher in low-income families (40). Naturally, the expenses and limitations increase when there is a great demand for care, which not only restricts the social freedom of the family members but also disturbs their peace and serenity. This association was significant in our study, confirming this relationship.

Limitations of this study include sample size because in our area there are 2 hospitals with psychiatric wards. Additionally the use of one self-report measure (the BDI) to measure depression only is another limitation in this study thus we recommend using interview addition of BDI in future study.

Conclusion
Taking care of bipolar patients due to depression in family caregivers. Therefore, it can be said that depression imposed by such patients threatens caregivers’ mental health, hence reduction in quality of care and support. Consequently, family centered programs are recommended for decreasing depression incurred by bipolar patients.

Governments can decrease the depression and increase the quality of care in caregivers through providing financial supports such as subsidy and so on, educational opportunities, and consultation services for family caregivers in state and free special health center for caregivers. This study highlighted the need to better understand caregivers’ views and personal perceptions of the depression and demands arising from caring for someone with BD in order to develop practical appropriate interventions and to improve the training of caregivers. Considering the relatively high prevalence of depression in caregivers and its effects on the performance of the family and quality of care, more studies are warranted in this regard.

Acknowledgement

This study was part of a research project approved by Dezful University of Medical Sciences (Ethics Committee Code: DURS114). The authors wish to thank the Vice-Chancellor for Research of Dezful University of Medical Sciences for their financial support, Mr. Ehsan Bahrampour for statistical analysis, all the personnel and patients of the Psychiatric Ward of Dr. Ganjavian Hospital and Shams Abad Psychiatric Hospital, and the caregivers who participated in the study.

References

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Doi: 1 0 .1 1 9 2 / bjp. bp .1 0 0 5 .0 2 0 8 2 6
40. Nazari SH. The evaluation of epileptic children's parents' idea about tension factors and their adaptation with this factor among persons referred to Tehran chosen remedial center [dissertation]. Tehran: Nursing and Midwifery Faculty, Tehran Medical University; 2003. [Persian]
Influence of sufentanil intrathecal administration on Second-stage labor duration

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Abstract

Background: Labor is a painful physiological process. Many techniques have been proposed for reducing this pain. Intrathecal administration is a strategy to labor pain reducing.

Methods: In this study 200 pregnant women with enough information were selected and divided into two groups (n=100) randomly. In first group labor, pain reduction by use of sufentanil and in second group not used any techniques. Total volume of 3 ml of Sufentanil was injected into intrathecal space. During the second stage of labor, delivery tools using, birth weight and Apgar score were investigated.

Result: The result showed that age, weight, height, parity, Gravitory, gestational age, Vacuum and BMI were similar in the groups. However, duration of second stage of delivery was different in the groups (p<0.05).

Conclusion: According to the findings of this study using of sufentanil in labor pain reducing in vaginal labor pain reducing is recommended.

Keywords: spinal anesthesia, sufentanil, second stage of labor

Introduction

Labor is a painful physiological process (1). Various techniques have been proposed to reduce this type of pain (2). Stress and anxiety in the pain, can be causes the release of stress hormones; such as cortisol, beta-endorphins and dramatic increase of catechol amines that this may have a disadvantage effect on uterine activity and uterine-chorionic blood flow (3, 4). Labor pain reducing techniques divided to two major categories, including Non-pharmacological and pharmacological methods (5). Non-pharmacological approaches are included training breathing techniques, psychological support and exercise (6). While pharmaceutical techniques are including of inhalation anesthesia (nitrous oxide), analgesics and various inhibitors in neuronal area (7). Different ways for regional analgesia in labor pain relief can be done (8). The elimination of pain sensation by keeping consciousness mother regional analgesia is basis of contribute to fetus exit.

The most commonly method of Regional analgesia Are included spinal, epidural and spinal-epidural techniques (9, 10). Although, epidural analgesia in many countries is the best strategies to labor pain reducing (11, 12). General and spinal anesthesia procedure has technically more fans in Iran. Only one stage intrathecal injection into the cerebrospinal fluid are done, in this technique. Medication and staffing reducing are the advantages of this technique (13). Other advantages of this technique are including of work in the short term, sedation, rapid and high rate of success, which will be beneficial, especially in the second stage of labor (14, 15).

Due to the opioid receptors presence in the spinal cord gelatinous material, intrathecal injection into the spinal neural pathways in different places will be blocked (16).

In general, pregnant women divided into three stages: first stage is starting with regularly contractions and painful uterine and leads to full dilatation of the cervix. Second stage begins with full dilation of the uterus and Finally ended by birth. Third phase begins with birth and with expulsion of the placenta will be completed (17).

As regards, duration of labor is the most important issue of spinal analgesia. In the absence of regional analgesia, first and second stages takes nine hours in nulliparous women and 6 hours in multiparous women (18, 19). Duration
of the second stage of labor was stratified into hourly intervals: 0-1 hour, 1-2 hours, 2-3 hours, and 3 hours or longer (20). Effect of intrathecal sufentanil administration on during the second stage of labor and amount of vacuum application were the main purposes of this study.

Material and method

After a written permission approval, from the ethics committee, researchers referred to Kamali Hospital of Karaj-Iran. A cephalic presentation or head presentation by obstetricians and lack of contraindications for vaginal delivery were mother's entry requirements into the present study. These patients had not contraindications for spinal analgesia. Blood tests including platelet count, hemoglobin and hematocrit were performed. Lack active bleeding, organ failure and paralysis of the extremities, coagulation disease and no prior history of anesthesia and numbness were other conditions of pregnant women entry requirements in this study.

200 pregnant women with enough information, were selected and then divided into two groups (n=100), randomly. The intervention of intrathecal administration was used as an only way to labor pain reducing, in first group. Any pain reduction method is not used in as second group (control group). After hydration with lactate ringer (500-1000 ml), mothers were placed in sitting position and spinal analgesia was performed in 6 cm of cervical dilatation, by an anesthesiologist.

At first, analgesia location (between the vertebrae L2 and L3) was disinfected with a percent completely betadine. Median local analgesic method by using of spinal needle number (25 or 27), attempted to intrathecal space achieving, in sitting position.

After the needle entry proving in intrathecal space or cerebrospinal fluid flowing from the needle hub, total volume of 3 ml (50 to 75 micrograms sufentanil in 1 ml normal saline) was inserted under sterile conditions and then the needle was removed.

Vital signs were controlled 10 to 20 minutes after the pain. Fetal heart rates every 10 to 15 minutes and second labor stage every five minutes were monitored. During the labor's second stage, using of delivery tools, birth weight and Apgar in groups were recorded.

Statistical analysis

The data via the chi-square tests, t-test and covariance to compare the significant differences among the treatments (P<0.05) was applied by use of SPSS version 18 (SPSS Inc., 176 Chicago, IL, USA). All data are presented as mean ± standard deviation (SD) unless indicated otherwise.

Results

This study shows that none of the mothers in trial groups had not any underlying disease. More than 99 percent of the mothers in pregnancy preparation courses and gestational age between difference groups was not statistically significant (table 1).

The result showed that age, weight, height, parity, Garavity, Vacuum and BMI were similar in the groups (table 1). However, duration of second stage of delivery was different in trial groups (p<0.05) (table 1).

There was no significant difference between Apgar at first and fifth minutes the groups. In addition, no significant difference was showed in Birth weight between the groups (table, 2).

Discussion

intrathecal administration is an efficient and uncomplicated anesthesia technique that if the proper training to mothers and reducing their fear, it can be so effective in pain reducing (21). Sufentanil and fentanyl, to be widely used as an analgesic in the spinal cord at labor. Small doses of a short-acting narcotics adding such as fentanyl or sufentanil, analgesics improve performance and the other hand prevents the motor blockage (22).

By using of sufentanil intrathecal administration, in present study, major features of the labor pain during delivery were not affected. The effect of labor pain management method with the use of Epidural anesthesia very well
studied and recorded but about the relationship between spinal anesthesia and duration of the second stage of labor there are differences of opinion.

However, several studies reported that epidural analgesia leads to longer delivery time (22, 23). With the use of sufentanil intrathecal administration significant increasing at duration of second phase of labor was observed, in the present study

In a similar study 45µg of Sufentanil to aim of pain decreasing in a laboring women was done. in the study was given sufentanil intrathecal in the course of combined spinal-epidural analgesia. This research effective analgesia during the second stage of labor showed that (24). In another study, 44 pregnant women with intrathecal fentanyl administration for labor analgesia, between the ages of 20-31 years was used. The results showed that labor duration was longer in the target group (25) that the result was similar to the present study (26).

In another study 60 Pregnant women selected and randomly divided to sufentanil and control groups. 10 micrograms sufentanil in the sufentanil group was injected in intrathecal space. The result showed that duration of the labor second stage in sufentanil and control groups was 37 and 33 minutes. The results showed that the duration of labor in the groups was not statistically significant that was different with the present study, but Mother vital signs, FHR and Apgar score were not significantly different between the two groups that was similar to our study (27).

In another study with the aim of analgesic effect of fentanyl labor process and infants born after injection into the spinal space in pregnant women as a candidate for natural delivery evaluated, In the control group did not use any method of analgesia. Finally, in two groups amount intervals of analgesia, first and fifth minute of newborns Apgar score were compared. Average delivery time showed statistically significant differences between trials groups (in experimental and control groups was 211 and 181 minutes, respectively) (25)the result was similar to present study.

Nelson et al (2002) reported that, by using of sufentanil and fentanyl in pregnant women with the aim of pain reducing. Pain relief, side effects, block-level maternal hemodynamic status, length of labor and FHR variables were studied in two groups.

Duration of analgesia in sufentanil group was significantly higher than fentanyl group (104 vs. 79 minutes).

But demographic characteristics, hemodynamic status, duration of labor, type of delivery, motor block, mentally weakness of the legs, itching, nausea, pinprick numbness level, VAS, fetal bradycardia and Apgar scores were similar in both groups. Based on these results the relative strength of sufentanil compared to fentanyl was 4.4 to one. Sufentanil analgesia also lead to a longer period and has no more side effects (28).

Opioids are Most common drugs that are used to relieve pain and often by injection methods. All opioids cross the placenta and the fetal heart rate happen (29). Onset of lipophilic opioids action (fentanyl and sufentanil) in the intrathecal administration is quickly and respiratory depression from the cerebrospinal fluid (25).

In a study effect of fentanyl to labor pain reducing in the second stage of labor increased and postpartum was better patient satisfaction (30). In the study, no significant difference between age, parity, body mass index was observed in this study, that this is similar with the present study.

Nevertheless, shortage information regarding mother and newborn child during second stage of labor prolonged (20, 31).

Investigators have mentioned that at the time of application of epidural anesthesia during the second stage of labor increases (32). Previous experiments have shown that by use of epidural anesthesia the duration of the second stage of labor significantly, was increased (32-34).

In our study, vacuum extraction was not statistically significant in two groups. Junichi et al 2012, demonstrated that vacuum extraction in pregnant women under spinal anesthesia in compared to the control group 6.5% vs. 2.9%, respectively, reported (35), that this results is different with the present study (1.9 vacuum extraction in both groups).

The purpose of using intrathecal is pain relief with fewest side effects in the mother and newborns child. As described in the results, maternal and new birth child variables included weight, height, age, gravity, parity,
gestational age, BMI, birth weight and Apgar in first and fifth minutes) In two groups in present study was not statistically significant. That present research was similar with Rimaitis et al, investigation (36). That this represents maximum similarity and minimum and errors in trial groups.

In another study, 60 healthy pregnant women receive epidural Analgesia with the use of Epidural sufentanil was prescribed. Mothers and newborn child parameters containing of age, height, weight, birth weight, gestational age, Apgar at 1 and 5 minutes showed no significant difference between the trial groups (37), that this is similar to our study.

Analgesia and epidural analgesia complications in different studies same composition have been reported. Recently, with the improvement of spinal analgesia techniques, the use of these methods for analgesia continuous in labor is taken into consideration (22).

Conclusions

A common complication of neuraxial analgesia can be noted lasted hypotension, upper spinal blocks, headache, seizure attacks, bladder dysfunction and arachnoiditis and meningitis. In intrathecal administrations these symptoms are limiting factors. In the present study no effect was observed with the use of sufentanil. So this technique as a conclusion by using of sufentanil in vaginal delivery pain reducing in pregnant women is recommended.

References


Table 1 – Maternal, pregnancy and second stages of labor characteristics in study groups

<table>
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<th>variable</th>
<th>Spinal analgesia (n=100)</th>
<th>Control (n=100)</th>
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<tbody>
<tr>
<td>Age</td>
<td>24.5±4.3</td>
<td>26.5±5.6</td>
</tr>
<tr>
<td>Weight</td>
<td>73.7±11.06</td>
<td>74.7±13.4</td>
</tr>
<tr>
<td>height</td>
<td>154.4±32.2</td>
<td>160.2±16.8</td>
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<td>Gravity</td>
<td>1.4±0.6</td>
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<td>Parity</td>
<td>0.3±0.4</td>
<td>0.3±0.4</td>
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<tr>
<td>Gestational age</td>
<td>274.5±8.7</td>
<td>270.5±24.9</td>
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<td>second stages of labor</td>
<td>48.3±44.8</td>
<td>38.3±23.1</td>
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<td>vacuum</td>
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<tr>
<td>BMI</td>
<td>27.2±6.7</td>
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Data are expressed as mean standard deviation (means ± SD)
Table 2 – Neonatal characteristics in study groups.

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<th>Control (n=100)</th>
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<tr>
<td>Apgar at 1 min</td>
<td>8.8±0.4</td>
<td>8.7±0.4</td>
</tr>
<tr>
<td>Apgar at 5 min</td>
<td>9.8±0.4</td>
<td>9.7±0.4</td>
</tr>
<tr>
<td>Birth weight</td>
<td>3175.9±384.67</td>
<td>3184.5±363.89</td>
</tr>
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</table>

Data are expressed as mean standard deviation (means ± SD).
Results of Ponseti Casting On Residual Clubfoot In Patients Referred To Shahid Motahari Clinic Between 2011 And 2014

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ABSTRACT

Background: The Ponseti method has revolutionized the treatment of patients with idiopathic clubfeet and more recently used for treatment of residual or recurrent clubfoot. The purpose of this study was to describe the use of the Ponseti method in the treatment of patients with residual clubfoot.

Methods: Records of 32 children with residual deformity treated by the Ponseti technique were reviewed retrospectively. The mean follow-up was 18.4 months (range, 14 to 45 months). Initial and final Pirani scores and DSI score of the patients were determined as outcomes.

Results: The initial success rate was 84.4% and Pirani score was more than 1 in 5 patients after treatment. Pirani score improved significantly after treatment from 5.5±0.8 to a post treatment value of 0.7±1.5 (P<0.0001). The total DSI score was 91.6±11.9 of 100 points with a satisfaction subscale of 87.3±15.6 and a function subscale of 96.1±9.1 points.

Conclusion: In conclusion, the Ponseti method can be successfully used to correct recurrent clubfoot deformity in children.

Keywords: Clubfoot, Ponseti method, Pirani score

Introduction

Congenital talipes equinovarus (CTEV), or clubfoot, is one of the most common musculoskeletal abnormalities in childhood which affect the lower limb. Its incidence is approximately 1-2 per 1000. The deformity has four components: equinus, forefoot adductus, hindfoot varus, and cavus (1).

The traditional treatment of congenital clubfoot has been mainly performed through complex surgical release procedures (2). Common complications related to this extensive surgery included recurrence of the deformity, overcorrection, long-term joint stiffness, and pain (3, 4). The disappointing long term results inspired some to seek out less invasive, more conservative treatments typified by the Ponseti method (5). The Ponseti method has become the gold standard for the treatment of idiopathic clubfoot. Its safety and efficacy has been demonstrated extensively in the literature, leading to increased use around the world over the last two decades (6, 7). The technique consists of an initial phase of serial casts with progressive abduction of the foot while maintaining counterpressure over the head of the talus. In the first cast the first metatarsal must be raised which means supinating the forefoot to align the forefoot with the hindfoot and to decrease cavus. The equinus is the last deformity to correct and in many cases this is done by a calcaneus tendon percutaneous tenotomy and a new cast for 3 weeks. The second phase consists of the use of a foot abduction brace, initially for 3 months, 23 hours a day, followed by use for 14 hours a day until the child is 4 years old (8).

Numerous researchers have reported a high initial correction rate and excellent long-term results using the Ponseti method (9-13). However, good results were not replicated by some authors who reported higher relapse or surgical rates (14-17). Although the Ponseti method is simple, careful attention must be paid to the details in this method. Failure to adhere to details, such as manipulation, type of brace, bracing protocol, and relapse management, might affect whether one obtains a good outcome.
Treating recurrent clubfoot after surgery puts the physician in a quandary. It is known that initial surgery leads to poor outcomes with significant pain, stiffness and fatigue. Repeated surgery has the potential to worsen these symptoms by further postoperative scar formation.

However, because the Ponseti technique has been successful in treating all kinds of difficult-to-treat clubfeet, some study reported using the Ponseti method in patients with recurrences. For example, in a retrospective review of all children treated since 2002, using the Ponseti method for recurrent clubfoot following posteromedial release, showed that the Ponseti method can be successfully used to correct recurrent clubfoot deformity in children treated with previous extensive soft tissue release. In addition, this treatment protocol prevents complications of stiffness, pain and difficulty in ambulating associated with multiple soft tissue releases for clubfeet (18). Moreover, a cohort study by Nogueira and Colleagues with the aim of treatment of recurrent clubfoot following failed surgery, demonstrated that plantigrade and fully corrected feet were obtained in 71 feet (86%); 11 feet obtained partial correction; one patient failed treatment and underwent another posteromedial release. Recurrences occurred in nine patients (12 feet or 14%). Initial Pirani scores improved in all except one patient (19).

The purpose of this study was to report the results of a 4-year experience of using Ponseti casting in residual and recurrent clubfoot after surgery at the referral university hospital.

**Materials & Methods**

Between March 2011 and February 2014, thirty two patients with a residual, fixed clubfoot deformity were reviewed who were treated according to the Ponseti treatment protocol. This is a retrospective study approved by the institutional review board (IRB) and the University Institutional Ethical Committee (92-01-01-6889).

The inclusion criteria just included the patients with idiopathic clubfeet and recurrence was defined as residual deformity in each major component of clubfoot including equinus, heel varus, forefoot adduction, cavus, and Pirani score > 1. Patients with any of the following criteria were excluded from the current study: positional, syndrome-associated, neurological clubfeet and patients younger than 1 year. Clinical determination of a residual clubfoot was made by the orthopedic attendings.

Ponseti method of serial manipulation and casting at weekly intervals was conducted by pediatric orthopaedic attending (8). The general order of deformity correction by this method is cavus, adductus, varus, and equinous. All corrections were performed by gentle manipulation and maintained with a plaster cast, extending from the toes to the upper thigh with the knee at 90 degrees of flexion. A percutaneous tendon achilles tenotomy (TAT) was performed under local anesthesia to address any residual equinus (<20 degrees of dorsiflexion), after the forefoot correction was complete (70 degrees of abduction) and the hindfoot was in valgus. After the tenotomy, the foot was cast in the fully corrected position for 3 weeks. After the removal of the posttenotomy cast or directly after full correction was achieved without a tenotomy, the patient was fitted with a foot abduction orthosis (open-toed, high-top, straight last boots and Denis-Browne bar), with the affected side(s) set at 70 degrees of external rotation and the unaffected side at 45 degrees. The brace was prescribed full time for 3 months in the patients under walking age and at night in them at walking age until 4 years of age. In addition, specific exercises were recommended.

**Data Collection**

The patients' records were reviewed to obtain information including age, sex, severity of deformity base on the Pirani score, laterality, family history, parents' education, number of casts for correction of deformity, need for TAT, and brace compliance.

The Pirani score can detect the degree of correction. It scores 6 clinical signs: 3 for midfoot (MS) and 3 for hindfoot (HS) grading the amount of deformity between 0 and 3. The Pirani score 0 means normal foot, the Pirani score 3 means moderately abnormal foot, the Pirani score 6 means severely abnormal foot. When Pirani score became 0, it was graded as excellent, when it became 0.5 to 1, it was graded as good and poor outcome occurs when the score became more than 1. Excellent and good outcomes obviously reflected to successful management. Poor outcome reflected treatment failure.

At follow up, outcomes of clubfoot treatment with Ponseti method reevaluated using a simple disease-specific instrument (DSI). The 10-item clubfoot DSI is an overall measure of clubfoot treatment outcomes with two distinct
five-item subscales: satisfaction and function (33). The satisfaction subscale items are (1) satisfaction with status of foot; (2) satisfaction with appearance of foot; (3) teasing; (4) problems with shoes fitting; and (5) problems finding shoes the child likes. The function subscale consists of (1) whether the child ever complains of foot pain; (2) limitations in walking; (3) limitations in running; (4) pain during heavy exercise; and (5) pain during moderate exercise. The total score includes all 10 items. Scores are computed by reverse-coding, summing the responses, and then dividing the result by the number of items completed, i.e., scores are a mean of the responses (Table 1). For ease of interpretation, the scores are linearly transformed to a 0 to 100 scale with 100 being best, so that 1 = 0, 2 = 33.3, 3 = 66.7, and 4 = 100 for questions with four possible answers. The one yes-or-no item (ever complains of pain in affected foot) was coded yes = 0 or no = 100 (reference??).

Statistical analysis

Data were analyzed using SPSS ver. 17 (SPSS Inc., Chicago, IL, USA). Values were expressed as mean ± standard deviation (SD) for the quantitative variables and percentages for the categorical variables. Data were compared using the Student's t-test for the continuous variables and the chi-square test (or Fisher's exact test if required) for the categorical variables. A p-value of less than 0.05 was considered significant.

**Table 1: Disease-specific instrument for patients with clubfoot**

<table>
<thead>
<tr>
<th>Item</th>
<th>Response codes</th>
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<tr>
<td>(1) How satisfied are you with the status of your child's foot?</td>
<td>1 = very satisfied, 2 = somewhat satisfied, 3 = somewhat dissatisfied, 4 = very dissatisfied</td>
</tr>
<tr>
<td>(2) How satisfied are you with the appearance of your child's foot?</td>
<td>1 = very satisfied, 2 = somewhat satisfied, 3 = somewhat dissatisfied, 4 = very dissatisfied</td>
</tr>
<tr>
<td>(3) How often is your child teased because of his or her clubfoot?</td>
<td>1 = never, 2 = sometimes, 3 = usually, 4 = always</td>
</tr>
<tr>
<td>(4) How often does your child have problems finding shoes that fit?</td>
<td>1 = never, 2 = sometimes, 3 = usually, 4 = always</td>
</tr>
<tr>
<td>(5) How often does your child have problems finding shoes that he or she likes?</td>
<td>1 = never, 2 = sometimes, 3 = usually, 4 = always</td>
</tr>
<tr>
<td>(6) Does your child ever complain of pain in his or her [affected] foot?</td>
<td>1 = yes, 2 = no, recoded 1 = no, 4 = yes</td>
</tr>
<tr>
<td>(7) How limited is your child in his or her ability to walk?</td>
<td>1 = not at all limited, 2 = somewhat limited, 3 = moderately limited, 4 = very limited</td>
</tr>
<tr>
<td>(8) How limited is your child in his or her ability to run?</td>
<td>1 = not at all limited, 2 = somewhat limited, 3 = moderately limited, 4 = very limited</td>
</tr>
<tr>
<td>(9) How often does your child complain of pain during heavy exercise?</td>
<td>1 = never, 2 = sometimes, 3 = usually, 4 = always</td>
</tr>
<tr>
<td>(10) How often does your child complain of pain during moderate exercise?</td>
<td>1 = never, 2 = sometimes, 3 = usually, 4 = always</td>
</tr>
</tbody>
</table>

Results

**Demographics**

Thirty two patients (54 feet) with a residual idiopathic clubfoot treated with the Ponseti method were evaluated retrospectively. Baseline characteristics of patients showed that twenty four (75%) patients were male and 8 (25%) were female with a male female ratio of 3:1. Twenty two (68.8%) patients had bilateral involvement and 10 (31.2%) patients were unilateral. The mean age of the patients at the beginning of treatment was 39.1 ± 26.2 months (range, 12 to 120 months). Among the mothers of patients, 43.8% (n=14) had high-school education or less and also 12 (37.5%) fathers had high-school education or less. Of these 32 patients, 19 (59.4%) patients were following failed surgery, and 13 (40.6%) of them had history of previous Ponseti casting.
Initial outcomes

The mean number of casts applied to achieve complete correction was 3.6±1.3 (range, 2 to 7). A total of 24 (44.4%) feet of the 54 feet had to undergo percutaneous tenotomy. No complication was seen after percutaneous tenotomy. After applying the Ponseti method, 27 patients were completely corrected and in 9 feet (5 patients) had failed treatment. Therefore, the initial success rate was 83.3% and Pirani score was more than 1 in 5 patients after treatment. The mean Pirani score at the beginning of treatment for all subjects was 5.5±0.8 with minimum of 3 and maximum of 6. It improved significantly after treatment from 5.5±0.8 to a post treatment value of 0.7±1.5 (P<0.0001). The 84.4% of families reported complete compliance with the brace and stretching exercises and a total of 5 patients (15.6%) had brace noncompliance (Table 2).

Follow up

The mean follow-up after treatment course, in 27 patients with complete correction was 18.4 months (range, 14 to 45 months). The total DSI score was 91.6±11.9 of 100 points with a satisfaction subscale of 87.3±15.6 and a function subscale of 96.1±9.1 points. In this study it was found that the DSI reflected several areas of parental concern regarding outcomes of their children: 55.5% reported being “very satisfied” with results, and none of them being “very dissatisfied.” Some 78% of patients were “never teased” about their foot (according to their parents), whereas 22% were sometimes teased; 81.5% had no limitations in walking, whereas 18.5% of patients had moderate limitations in walking. Similarly, 74% of patients reported “no problem” finding shoes that fit properly, and 81.5% of the patients reported “no problem” finding shoes that kids liked. The presence or absence of pain was another important issue, whereas none of them experienced pain.

Discussion

CTEV or clubfoot is one of the commonest congenital deformities. It is a complex deformity comprises of equinus, varus, adductus and cavus, which are difficult to correct. It requires meticulous and dedicated effort on the part of treating physician and parents for the correction of the deformity (20). The goal of treatment is to reduce or eliminate these deformities so that patient has a functional, pain free, plantigrade foot with good mobility without calluses and does not need to wear modified shoes (21).

Many studies have shown poor long-term function after surgical treatment of clubfoot (3, 4, 36-38). They are frequently stiff, painful and have limited range of motion. Recurrences are usually treated with further surgery; however, this only worsens long-term functional outcomes. Dobbs described a cohort of 45 patients with long-term follow-up after surgical treatment of clubfoot (4). Number of surgical procedures was associated with significantly worse functional and radiographic outcomes in patients with clubfeet. Although it is tempting to surgically revise the failed clubfoot after posteromedial release, this evidence suggests that surgery only leads to further functional compromise.

Prior literature has described successful use of the Ponseti method in neonates and older infants (22-24). The Ponseti casting technique of correction of CTEV deformity requires serial corrective casts with long term brace maintenance of the correction. The treatment needs to be started as soon as possible and should be followed under close supervision (22). The Ponseti casting technique yielded satisfactory anatomical and functional result with simple, effective, minimally invasive, inexpensive and ideally suited for all countries and cultures (22).

A recent series from Iowa reported on the use of the Ponseti method in neglected clubfeet in children who were ambulatory. The average age in their series was 3.9 years and 16 of 24 feet were able to be corrected without soft tissue release (24). It was observed that the Ponseti technique for treating clubfoot has been popularized for idiopathic clubfoot and more recently several syndromic causes of clubfoot.

In the present study 32 patients with recurrent clubfoot were attempted to correct with the Ponseti technique. In our study, 84.4% patients were managed successfully without any complication and they had Pirani score less than 1 after complete treatment course. The initial success rate 84.4% was in accordance to the international figures. Nogueira et al. (19) reported 86% fully corrected feet in 71 out of 83 clubfeet. In another study, Garg et al. (18) utilized the Ponseti method of manipulation and casting and when indicated, tibialis anterior tendon transfer, instead of revision surgery for these cases. Their results demonstrated that complete success was achieved in 81.8% of the patients.
The mean number of casts required per feet in the present study was 3.6±1.3 (range, 2 to 7), similar as compared to the other series (20, 21, 23). Moreover, percutaneous tenotomy was required in 14 (43.8%) of the patients, much less as compared to the other series. In a study by Saif Ullah et la. (23) 86.2% feet required percutaneous tenotomy. Also, tenotomy was needed in 95% of Gupta’s patients (20) and 91% of Dobbs’s patients (4). All the studies show that tenotomy was required in those patients who initially have severe deformity. Bor et al quoted, “A foot that requires many casts for the initial correction is more likely to require future additional surgery” (25).

In this study an improvement of all feet evaluated by the score of Pirani et al. was observed; a finding observed in many different treatment centers considering idiopathic clubfeet treated by the Ponseti method (2, 6). In addition, it improved significantly after treatment from 5.5±0.8 to a post treatment value of 0.7±1.5 (P<0.0001). Consistently with our results, other study on recurrent clubfoot reported significantly improvement in Pirani score after Ponseti method (18, 19).

The DSI score was introduced by Roye et al. (26) and was validated by Dietz et al. (27). In the present study the DSI score was of 91.6±11.9 of 100 points. This is similar what was reported by Radler et al. (28) which was reported midterm results of the Ponseti method in the treatment of congenital clubfoot. The DSI score in their series was of 85.3±13 of 100 points.

There were a number limiting factors diminishing the impact of results, including a relatively small sample size as a main limitation. Additionally, the short period of follow-up is another one. Moreover, this method is very individual-dependent and the skill of the person to perform it affect outcomes.

Conclusion

Although less evidences has described using the Ponseti method for residual feet, the present results demonstrate that it is possible to use its principles to improve or correct relapsed or uncorrected clubfeet presenting after a previous surgery or previous casting. The knowledge of the biomechanics and kinematics of the subtalar joint (11) is helpful in understanding the pathology and treatment of clubfoot. It is believed that the scars and fibrotic tissues are stretched, allowing the motion and remodeling of bones and cartilage.

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References

The Effects of Short-Term Caffeine Supplementation on the Isocapnic Buffering and Hypocapnic Hyperventilation Phases in Sedentary Men

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Abstract

Purpose of this study was to investigate the effects of acute supplementation with caffeine on the isocapnic buffering and hypocapnic hyperventilation phases in sedentary young men. Thirty male healthy non-athletic students (Age 20.78 ±1.66 years, Height 173.83±8.06 cm, Weight 70.44±9.76 kg) were randomly divided into supplementary and placebo groups. The study was conducted in two stages with an interval of one week. In pre-test the subjects of both groups performed the protocol on a computerized treadmill without taking any drugs. In the post-method one hour before the main test, the supplementary group subjects were provided with 6mg of caffeine per kilogram of body weight and the placebo group were provided with the same amount of starch. V-Slope was measured with the respiratory gas analysis system for estimating the isocapnic buffering and hypocapnic hyperventilation phases. Under curve surface area was estimated using of integration function. Analysis of covariance (ANCOVA) aimed to control the pre-test scores as a covariate was used to analysis the data. Results indicated that acute caffeine supplementation despite of positive effects on the aerobic and anaerobic thresholds as well as the peak values, has no a significant effect on isocapnic buffering and hypocapnic hyperventilation phases. Based on the results we can conclude that presumably acute supplementation of caffeine shifts the isocapnic buffering and hypocapnic hyperventilation area to the right side and delay fatigue which has to be studied in the future.

Key Word: Caffeine, Isocapnic Buffering, Hypocapnic Hyperventilation, Sedentary Men.

Introduction:

Today, participation in sports activities, in addition to being a proper activity between athletes, as well as in individuals of different age’s advice in order to raise the level of health and fitness. One of the most effective parts of body in sports activities is cardio respiratory system. In fact, the function is defendant to main function of respiratory, the cardiovascular system, and skeletal muscle (Rodney et al, 2007). Many people with different motivation use variety of nutritional supplements, oral or inject medications, even forbidden materials from the World Anti-Doping Agency (WADA), which can be affect the fitted their activities. One of these supplements that nowadays used in the world by many amateur and professional athletes is caffeine to improve sport performance. Caffeine is similar to Crystal, has white color and taste bitter called 1, 3 and 7 (3-Methyl-13C) with C8 H10 N4 O2 formula. This material is found in coffee, tea, chocolate and some drinks. Caffeine as an energize agent are advised to act on the liberation mechanism of catecholamine in sports activities to improve the level of sport performance of athletes (Whitham, 2006). The researchers concluded that supplement use of caffeine increase free fatty acids and decrease Glycol sis and blood lactate and subsequently delayed physical fatigue in heavy and overwhelming activities (Peker et al, 2005).

The anaerobic threshold, due sudden increase in the lactate amount of blood, or increase the ratio of lactate define Private used widely in designing and compiling of the endurance program (Neal, 2011). This index used as a tool to predict the performance of endurance athletes (Coen, 2001). A number of research determined that there are two ventilation threshold or lactate threshold (LTs) during training until lag. From the physiological point of view, we
can define three-stage powering and two-point of defeat with increasing intensity of the workout. A lot of the terminology described for the first and the second threshold of lactate. According to Skinner and Maclean, the first threshold named aerobic threshold and the second threshold named the "anaerobic threshold" (Binder et al, 2008). The distance between the aerobic thresholds to anaerobic thresholds called Isocapnic buffering phase and the distance between the aerobic phases up to the stall called hypocapnic hyper ventilation phases. In other words, it has been shown that increasing physical activity along with increased levels of blood lactate, pressure volume of dioxide carbon at the end of present volume (PETCO$_2$) at working loads beyond LT up to compensation point of breath (RCP) remained constant or increased a slight. This smooth stage PETCO$_2$ from LT to RCP defined as Isocapnic buffering (Wasserman, 1980; Whipp, 1998). On the other hand, in hypocapnic hyperventilation phase, with increase of ventilation after the RCP, the amount of PETCO$_2$ reduced gradually until the occurrence of fatigue and in contrast, oxygen pressure increase at the end of this volume (PETO$_2$) (Binder et al, 2008). These phases designed for sports application with the appropriate intensity. It seems that training intensity is the most important factor in the training program. The evidence suggested that in some people, training with 45% intensity of aerobic power or less, has significant effects, but suitable intensity is at least 60% VO2max for most people (Wilmore, 1994). Endurance training requires manipulating the intensity, duration and frequency of training sessions during the day, week and month. Slow trainings on long distance, training the lactate threshold, high intensity training (HIT) are all familiar terminology of training in different areas of intense scale. . The relative impact of various combinations, from intensity and duration of exercise, have studied and discussed in recent decades among athletes, coaches and scientists (Seiler, 2010).

Neal and his colleagues (2011) in a study surveyed distribution of training intensity and physiological adaptations during a 6-month period on iron men (before tournament). Ten athletes take part in three training courses (A, B, C) that everyone lasted for two months. They used lactate threshold and lactate threshold point (LTP) to determine the training intensity areas. The average percentage time spent in regions 1, 2, 3, are 69±% , 25±8 % and, 6±2% respectively. Its results show that the average physiological compatibility can be created during the six month training period with low to moderate effect. They result that the distribution of exercise intensity has low effect during period (Neal, 2011).

In a revision that Larsen had done (2010) suggested, the polarized approach to practice be done, in nearly 75% of the total volume with low intensity and 10-15% be done with maximum intensity that intensity distribution may be good training for elite athletes who compete in endurance events (Larsen, 2010).

According to the inadequate research about short time supplementing impact of caffeine on isocapnic buffering and hypocapnic hyper ventilation phases on one hand and the lack of adequate scientific data, as well as being an important study in the designing training program with effective intensity for athletes, the present study aimed to determine the effect of short-term supplement caffeine on isocapnic buffering phases and hypocapnic hyper ventilation of sedentary men.

**Methodology:**

The samples of present research consists of 30 sedentary (with a age mean of 20.78± 1.66 years, 173.83±8.06 cm height and 70.44±9.76 kg weight). After signing satisfaction form by the subjects measured preliminary measurement. The subjects 72 hours before all the tests, avoided to do any severe activities. The test performed by subjects in two-stages with a week interval. At the pre-test stage, subjects of two groups without taking any kind of drug ran on treadmill under computer control of the Bruce Protocol and at the post-test stage, one hour before the main test, the subjects of supplement Group received 6 mg caffeine per kilogram of weight, and concurrent their placebo group received the same amount starch in the uniform jelly capsule along with 200 mm liter water and For maximum caffeine concentrations on blood an hour sat an hour on the Chair and after 5 minutes warming, they repeat exactly the same test. Before and after taking the caffeine pill, through sports activity on a treadmill, were measured V-Slope of subjects.
The graph of V-Slope shows the volume of dioxide carbon to oxygen that in this diagram vertical axis represents the volume of produced dioxide carbon and horizontal axis represents the volume of consumed oxygen. Based on the curve set points of aerobic, anaerobic threshold as well as stall points, and with it, the level below the curve of the Isocapnic buffering phases (the threshold of aerobic up aerobic threshold) and hypocapnic hyper vitalization (a distance of aerobic threshold to stall) measured by integral operation.

From the beginning of the test until stalling, the respiratory gases of subjects collected through the mask of Germany Power Cube–ergo device. Such that this device registered, automatically, the amount of oxygen consumption, dioxide carbon production and ventilation, on average, at intervals of 10 seconds throughout the duration of the test. In the end, the cooling program will run for 5 minutes (Gaisl, 1990).

Statistical method:

To check normal distribution of data used Shapiro-wilk test. To calculate the level below curve chart used V-Slope to estimate buffering isocapnic phases, hypocapnic hyperventilation used integral operation and used ANCOVA statistical test to compare the results of the post-test with pre-test as covariance. Significant difference of variables was considered at the level of $P \leq 0.05$ and used SPSS software for data analysis.

Results:

Preliminary results related to the physical variables and body combination using Shapiro-wilk test showed homogeneous and non-significant difference between the two groups. Physical characteristics and body combinations of subjects are represented in table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>20.78 ± 1.66</td>
</tr>
<tr>
<td>Height (Cm)</td>
<td>173.83 ± 8.06</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>70.44 ± 9.76</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>14.21 ± 4.77</td>
</tr>
</tbody>
</table>

Covariance analysis results to compare the size of the curve below buffering isocapnic phases and hypocapnic hyper ventilation showed, although the volume of consumed oxygen and produced dioxide carbon on the aerobic threshold, the anaerobic threshold and maximum increased in the supplement group, but the volume below the curve of buffering isocapnic phases and hypocapnic hyper ventilation phases show any significant difference in the two groups of placebo and supplement (tables 2 and 3). On the graph 1 is shown buffering isocapnic and hypocapnic hyperventilation phases of a study.
Graph 1: Isocapnic buffering and hypocapnic hyperventilation phases of a patient by use of V-Slope

Table 2: Mean ± SD indices in two groups

<table>
<thead>
<tr>
<th>Ventilation (L/S)</th>
<th>CO₂ (L/min)</th>
<th>VO₂ (ml.kg.min)</th>
<th>Group</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>18.5 ± 6.95</td>
<td>16.12 ± 11.90</td>
<td>0.70 ± 0.34</td>
<td>0.7 ± 04</td>
<td>9.3 ± 3.8</td>
</tr>
<tr>
<td>21 ± 6.30</td>
<td>18.6 ± 6.9</td>
<td>0.68 ± 0.29</td>
<td>0.63 ± 0.25</td>
<td>13.2 ± 5.77</td>
</tr>
<tr>
<td>88.50 ± 18.7</td>
<td>83 ± 15.32</td>
<td>39.15 ± 5.9</td>
<td>36.11 ± 9.8</td>
<td>39.12 ± 6.14</td>
</tr>
<tr>
<td>80.20 ± 13.50</td>
<td>83.40 ± 15.60</td>
<td>33.74 ± 7.9</td>
<td>34.84 ± 8.31</td>
<td>34.11 ± 8.35</td>
</tr>
<tr>
<td>138.41 ± 14.1</td>
<td>130.3 ± 31.57</td>
<td>4.5 ± 0.62</td>
<td>3.96 ± 0.67</td>
<td>50 ± 5.87</td>
</tr>
<tr>
<td>138.6 ± 17.90</td>
<td>140.26 ± 24.89</td>
<td>5 ± 0.7</td>
<td>5.1 ± 0.7</td>
<td>46.37 ± 4.28</td>
</tr>
</tbody>
</table>

Caffeine: Aerobic Threshold
Placebo: Anaerobic Threshold
Placebo: Exhaustion time

Table 3: Mean ± SD isocapnic buffering & hypocapnic hyperventilation in two groups

<table>
<thead>
<tr>
<th>P Value</th>
<th>Before</th>
<th>After</th>
<th>Group</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.574</td>
<td>2.92 ± 0.67</td>
<td>2.37 ± 1.22</td>
<td>Caffeine</td>
<td>isocapnic buffering (m³)</td>
</tr>
<tr>
<td></td>
<td>2.17 ± 1.69</td>
<td>3.48 ± 2.02</td>
<td>Placebo</td>
<td></td>
</tr>
</tbody>
</table>

| 0.368   | 2.04 ± 1.67 | 2.91 ± 1.08 | Caffeine | hypocapnic hyperventilation (m³) |
|         | 2.43 ± 1.76 | 2.27 ± 0.57 | Placebo |                      |
Conclusion:

The present study evaluates the effect of caffeine on isocapnic buffering and hypocapnic hyperventilation phases of sedentary men in helpless protocol. The results of the covariance analysis of two groups placebo and supplement showed there is no significant differences in the below curve level of buffering isocapnic and hypocapnic hyperventilation phases, even though shown a significant increase in the volume of consumed oxygen and manufactured dioxide carbon on the aerobic, anaerobic and maximum threshold.

Caffeine increase catecholamine levels and has several physiological effects, including speeding the uptake process of oxygen and muscle Glycolsis (Goldstein and et al, 2010; Tarnopolsky, 1994), but improved performance of caffeine is due to direct oppose with A1, A2a receiver on skeletal muscle membrane that improves the contractile couples stimulation (Tarnopolsky, 1989) through releasing more calcium of the Sarcoplasmic network (Tallis et al, 2012) or improving sodium potassium pump activity of dependent energy (NA+/K+ ATPase).

As you see in the present study, the volume of consumed oxygen and manufactured dioxide carbon increased on aerobic threshold, anaerobic and the maximum threshold, therefore, as a result of such measures can be fitted that caffeine expanded the x-axis ($V_{O2}$) and the Y axis ($V_{CO2}$) of -V Slope curve, but according to the estimation of the total below curve level of buffering isocapnic and hypocapnic hyper ventilation phases, was observed any significant change in the post-test and pre-test of two supplement and placebo groups. To justify this lack of difference, according to rise and drop of V-Slope curve in performance time of helpless protocol and probably because of low or shift to the right side of the curve, in buffering isocapnic phases and hypocapnic hyper ventilation despite raise of maximum amount an of VO$_2$ and VCO$_2$ after caffeine supplementation, observed any incremental under the curve area. As diagram 1, these phases after complementation shift to the right and down side and this likely express fixed level below the curve of buffering isocapnic phases and hypocapnic hyper ventilation. In fact, this suggests that probably increased the tampon power of the body in the supplement group and delayed fatigue in supplement group against to the placebo group.

In accordance with this research, Chicharro et al (2000) yielded a study about professional cyclists and observed a similar shift in the ventilator threshold (equivalent of aerobic threshold) and point of breath compensation (equivalent to anaerobic threshold), which both reflect the range of buffering isocapnic, this action throughout the season represents the lack of change, in terms of area under the curve, in the buffering isocapnic phases during season.

In contrast of our findings, a study conducted by Rocker and et al (1994) which show that the buffering isocapnic phases of 400 meter elite runners is larger than endurance runners (Non-elite) and non-athlete subjects. It is possible that severe seasons like anaerobic metabolism (like what happens in 400 meters run) improve buffering capacity and the same makes larger buffering isocapnic phases than endurance athletes that can be studied in the future.

On the other hand, in a study by Agostoni et al (2008), disappearance of buffering isocapnic phases represents a subsequent increase of sport activity in high altitudes, decrease of ventilation, VO$_2$ and PETCO$_2$ amount, and subsequently disappearing or shorting buffering isocapnic phases.

Some of the evidence show caffeine in non-toxic physiological concentrations creates energize effects through inhibition of adenosine receptors (Fredholm et al, 1999). The findings of the Mousavi et al (2011) showed that caffeine consumption has no significant impact on maximum oxygen consumption, heart rate and blood pressure at the end of the practice.

Damirchi and et al (2009) after studying the effect of caffeine on blood pressure during maximum activity and rest in overweight people, showed that 13 minutes running on the treadmill with 63% maximum oxygen consumption increase significantly systole, diastole and the average blood pressure at rest time. At the end of the activity, the differences between the experimental group and placebo were not statistically significant. Also, the significant difference wasn’t observed in heart rate of two groups. At present it is difficult to compare previous findings with present one, because in different studies used different doses of caffeine, different type and intensity of the exercise...
and various subjects. As well as the impact of caffeine varies from one person to another, so more research is necessary in the field.

Reference
Mean Perineal Length in Iranian women

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Where the work was done: Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Presented at a meeting: Presented at the journal club in Imam Reza Hospital.

ABSTRACT

Introduction. Perineal length has an important role in the diagnosis and classification of pelvic organ prolapse. There are few studies on the length of perineum in different races in adults. Some studies have shown that perineal length is correlated with incidence of episiotomy and severe perineal tears. The aim of this study was to investigate the mean perineal length and its relationship with third- and fourth-degree perineal tears in nulliparous women.

Materials & Methods. In this descriptive-analytical and cross-sectional study, 310 nulliparous women admitted to labor wards of Imam Reza and Motazedi Hospitals in Kermanshah from between 2013 to 2015 were investigated. For all women, measuring the length between fourchette and anus was performed in lithotomy position. If necessary, a midline or mediolateral episiotomy was performed. Degree of perineal tear was determined by observation. Collected data were analyzed by SPSS-21 statistical software, Mann-Whitney U test and logistic regression analysis.

Results. The mean age of women was 25.54±3.46 years and the mean perineal length was 3.21±1.11 cm. No third- or fourth-degree perineal tear was observed. 261 subjects (84.2%) needed for episiotomy and their mean perineal length was 2.95±0.87 cm. 49 subjects (15.8%) didn’t need for episiotomy and their mean perineal length was 4.58±1.24 cm, that the difference between them was statistically significant (P<0.0001). there was a significant relationship between perineal length and the need for episiotomy (P<0.0001).

Conclusions. The results of this study showed mean perineal length in Iranian women was 3.21±1.11 cm and there was a significant relationship between perineal length and the need for episiotomy, so that increasing the length of perineum reduced need for episiotomy.

Key Words. Mean Perineal Length, Perineal Tears, Nulliparous Women

INTRODUCTION

Perineal length has an important role in the diagnosis and classification of pelvic organ prolapse. In the new terminology, to define the standards of pelvic organ prolapse and pelvic floor dysfunction, the length of perineum is
used. Perineal tears in different races are different. In one of the studies have shown that the incidence of second-
and higher degree tears in black women was lower than white women and most of them, at the time of delivery had
intact perineum [2]. The measured values of perineal length in newborns have been well calculated and recorded,
but in adults, there are few studies on the length of perineum in different races [3]. In another study, it was found
that the average length of perineum in Asian women was about one centimeter less than Caucasian women and the
incidence of third-degree perineal tears was more in the women with shorter perineum [4]. Other researchers in their
study have also reported that the incidence of third-degree and severe perineal tears was higher in Asian women
[5,6].

Episiotomy is an incision of the perineum done by a physician or midwife to complete the second stage of labor. If
episiotomy is done too late, vaginal and deep perineal muscles tears occurs and if it is done too early, bleeding
occurs [7]. Several maternal, fetal and surgical factors affect the incidence of perineal tears. There is little
information about the relationship between perineal tears with perineal length as a strong risk factor [8]. The
incidence of episiotomy and perineal tear of posterior perineum is higher in women with perineal length less than 4
cm [9].

In recent years, health care managers in Iran in accordance with international standards recommend the adjustment
of episiotomy during childbirth, but there is a fear among physicians and midwives that the lack of episiotomy may
cause unfavorable outcomes for mother and even baby. The aim of this study was to determine the average length of
the perineum in nulliparous women and its relationship with perineal tears. The rate of episiotomy in labor and type
of episiotomy were also noted.

**MATERIALS & METHODS**

In this descriptive-analytical and cross-sectional study, 310 nulliparous women admitted to labor wards of Imam
Reza Hospital in Kermanshah from August 2013 to August 2015 were investigated. The samples were selected by
non-randomized and convenience sampling. At first, the informed consent was obtained from the mothers for
participating in the study and measuring the length of perineum. Maternal demographic characteristics were
recorded. Then, in the lithotomy position, the length between fourchette and anus was measured. The measurements
were done by two trained medical students using the disposable paper tapes. Episiotomy was performed by a trained
resident of gynecology and the type of episiotomy (midline or mediolateral) was recorded. Degree of perineal tear
was determined by observation. Grading of perineal tears was defined as follows: In first-degree tear, fourchette,
perineal skin and vaginal mucosa is torn. In second-degree tear, in addition to the skin and vaginal mucosa, perineal
fascia and body muscles are torn. In third-degree tear, in addition to the rupture spreads to the skin, vaginal mucosa
and perineal body, anal sphincter is torn, and in fourth-degree tear, the rectal mucosa is torn and rectal lumen is
appears [10].

The inclusion criteria included nulliparous women with term gestational age (greater than or equal to 37 weeks).
Exclusion criteria included pre-term labor, elective cesarean section, vacuum or forceps delivery, non-cephalic
presentation and multiple birth, history of connective tissue disease such as Ehler-Danlos, Marfan syndrome and
dermatomyositis, epithelial disorders of vulva, vulvar lesions such as carcinoma, herpes infection involving the
perineum and perineal giant condyloma.

Collected data were analyzed by SPSS-21 statistical software. The frequency, percentage, mean and standard
development were used to describe the data. Tables and charts were drawn to display data distribution. Mann-Whitney
U test was used to analyze quantitative data. Logistic regression analysis was used to analyze the relationship
between perineal length and the need for episiotomy and calculate Odds Ratio (OR). A significance level of 0.05
was considered for all tests.

**RESULTS**

A total of 310 nulliparous women were studied in perineal length, perineal tears and episiotomy. The mean age of
women was 25.54±3.46 years (range: 17-35) and the mean perineal length was 3.21±1.11 cm (range: 1-6.5). No
third- or fourth-degree perineal tear was observed.
261 subjects (84.2%) needed for episiotomy and their mean perineal length was 2.95±0.87 cm. 49 subjects (15.8%) didn’t need for episiotomy and their mean perineal length was 4.58±1.24 cm, that the difference between them was statistically significant (P<0.0001) (Figure 1 and Table 1).

Figure 1. Distribution of the mean perineal length by doing episiotomy among nulliparous women

Table 1. Distribution of the different values of perineal length by doing episiotomy among nulliparous women

<table>
<thead>
<tr>
<th>Perineal Length</th>
<th>Episiotomy Yes</th>
<th>Episiotomy No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 3 cm</td>
<td>172 (55.5%)</td>
<td>7 (2.2%)</td>
<td>179 (57.7%)</td>
</tr>
<tr>
<td>3-5 cm</td>
<td>86 (27.7%)</td>
<td>29 (9.4%)</td>
<td>115 (37.1%)</td>
</tr>
<tr>
<td>≥ 3 cm</td>
<td>3 (0.9%)</td>
<td>13 (4.2%)</td>
<td>16 (5.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>261 (84.2%)</td>
<td>49 (15.8%)</td>
<td>310 (100%)</td>
</tr>
</tbody>
</table>

Logistic regression analysis showed that there was a significant relationship between perineal length and the need for episiotomy (P<0.0001). In the women with perineal length of 3-5 cm, the need for episiotomy 0.12 against the women with perineal length less than 3 cm [OR=0.12 (0.95 CI: 0.05-0.28)] and in women with perineal length greater than 5 cm, the need for episiotomy 0.009 against the women with perineal length less than 3 cm [OR=0.009 (0.95 CI: 0.002-0.042)].

DISCUSSION

In this study were measured the perineal length in nulliparous women, but no third- or fourth-degree perineal tears were reported. The findings showed that the mean perineal length in the samples was 3.21 cm that was lower compared with four other study, so that in the study of Rizk (2005) was 4.1 cm [11]. In the study of Dua, et al. (2009) also perineal length in white women was 7.3 cm and in Asian women was 3.6 cm [4]. In the study of Tsai, et al. (2012), this value in women with and without severe rupture was 3.9 cm (12), that Deering, et al. (2004) in their study also reported this value as 3.9 cm [13]. The difference between the average obtained in above studies and present study is justified regarding the racial differences and differences in the studied groups.

In the present study, the majority of nulliparous women needed for episiotomy (84.2%) that mediolateral episiotomy was performed in all cases and a less percentage of women who had no need for episiotomy (15.8%), their mean perineal length was more, so that the results of this study showed that increasing perineal length reduces the need for episiotomy. But in the study of Rizk in Emirates, the need for episiotomy was about 65% and more patients were nulliparous [11]. Dua, et al. also found that in Asian and Caucasian nulliparous women with short perineum, the rates of third-degree tear were more. It was seen an inverse relationship between perineal length and third-degree perineal tears in nulliparous women [4], although in this study, no third- or higher degree tears were observed. Tsai, et al. who divided the studied samples into six groups of Japanese, white, Filipino, Hawaiian, native and...
Micronesians, concluded that there was not any difference between perineal length and severe perineal tears in different groups [12]. Deering, et al. in USA found that patients with perineal length shorter than or equal to 2.5 cm, in particular had more third- and fourth-degree tears and in patients with perineal length shorter than or equal to 3.5 cm, the rate of delivery by cesarean section was higher [13]. In other studies on women in East Asia such as Japan, Korea and China, it was found that rate of severe perineal injuries was higher in these women and hence, Asian race is as a risk factor for severe perineal tears. It seems that shorter length of the perineum in Asian women leads to more perineal tears [15,14]. On the other hand, the study of Kalis, et al (2005) in UK showed that short length of the perineum was not a risk factor for episiotomy or perineal tears [16] that finding is not consistent with the present study.

CONCLUSION

The results of this study showed that there was a significant relationship between perineal length and the need for episiotomy, so that increasing the length of perineum reduced need for episiotomy. Most nulliparous women who needed for episiotomy had perineal length of about 3 cm and mean perineal length in this population is also 3 cm, hence, the need or lack of need for episiotomy should be responsible for performing the delivery (physician or midwife) to make their decisions according to the patient's condition.

Although Asian race is one of the risk factors for episiotomy and in those with short perineum without doing episiotomy, irregular tears occur that their repair is more difficult than regular incision of episiotomy and increase the probability of third- or fourth-degree tears. But that routine episiotomy in nulliparous women who have rigid perineal than multiparous women, also does not seem logical. Due to complications of episiotomy after delivery in women and postpartum pain and discomfort, delaying the return to sexual intercourse, probability of opening of the sutures, infection and genital prolapsed, it is suggested that it’s decided about episiotomy according to the mother's mental condition, maternal height and weight and birth weight. Also, given that in this study only nulliparous women with Asian descent were evaluated, it's recommended that further studies with larger sample size were performed to confirm the results of this study.

Acknowledgment

With regards to midwiferies of labor ward, Imam Reza hospital.

CONFLICT OF INTEREST

None declared.

REFERENCES