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<td>undergoing coronary artery bypass graft</td>
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Examining Response Time to Emergency Cases and Causes of Delay in Missions of 115 Prehospital Emergency Center in Khorramabad

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Abstract

Introduction: pre-hospital emergency is an important department in healthcare service system. Immediate, efficient and effective healthcare services save lives of many people and reduce the severity, length of illness and side effects.

Methods: This was a descriptive, cross-sectional study on 5431 missions in five urban centers in Khorramabad in the first six months of 2016. Mission duration (dispatch time and response time interval from call receipt to ambulance arrival at the accident scene) and causes of delay in missions were analyzed.

Findings: findings showed that 74.8% of missions were performed in less than 8 minutes (at the standard time). Dispatch of ambulance from areas other than nearby centers (29.2%), route crowdedness (traffic) (25%), long distance (22%), etc. were high frequency causes of delay in response to emergency cases.

Conclusion: given the importance of 115 prehospital emergency care centers in reducing response time to emergency cases, the Ministry of Healthcare and Medical Emergency Department and other relevant organizations (e.g. Traffic Police) should allocate more funds to this sector and perform an accurate need assessment for required number of ambulances, emergency equipment and centers based on population density and public demand in every urban area.

Keywords: prehospital emergency, standard dispatch time, medical emergency

Introduction

The government decided to launch the pre-hospital emergency system in 1997 in Iran after collapse of the roof at Mehrabad airport terminal that killed many people. Nowadays, prehospital care is a vital issue in treatment of emergency patients. If all departments in system function properly, the ambulance will be immediately dispatched to the accident scene in a timely manner, which will reduce mortality and disability rates. Successful performance of this department depends on various factors including capability of the authority, trained personnel, equipment, coordination and communication system. Currently, prehospital emergency is the first unit in contact with critical patients in any urban health care system. The more accurate, more precise and faster the
EMS care, the lower the rate of mortality and disability. This also increases public trust in the prehospital emergency care system (1-3).

Emergency is the most important department in every health system (4). Hospitals cannot deliver proper healthcare services to the patients unless a medical emergency center is designed in every hospital. Although this department is always neglected by the authorities, it requires substantial reforms and planning. Efficiency of this department was discussed in both public and private sectors in Iran for many years. This department is tied with societal healthcare service delivery (this department is essential in provision of immediate care services to critical patients in any society). Since prehospital emergency care is the first aid services given to the patients, efficiency of the system directly affect the patients and their families and friends. Timely arrival of the ambulance at the accident scene is also an important issue in this department. Immediate, efficient and effective emergency care services could save lives of many people and reduce both severity and length of the disease. Emergency patients require immediate attention and treatment. Resuscitation is also vital for these patients in emergency and crucial situations because it keep them alive so that they can reach hospital for specialized treatment that cannot be provided at the accident scene. Immediate and proper treatment can save injured people and help them to do their usual daily activities sooner in case that the injury is not fatal. Delayed and inefficient treatment would keep the patients from their usual lives for a longer period. In some cases, delayed and inefficient treatment might result in costly long periods of healing process rehabilitation for the patients that will keep the patients to go back to work for long periods of time. Thereby, the emergency department should refrain from any delay in delivery of healthcare services (5). In this regard, high speed of service delivery in health centers (especially, prehospital emergency department) reduce mortality and morbidity rates.

Various scholars have shown that response time interval to emergency cases is one of the most important assessment criterion in emergency centers (6). Emergency medical service system guidelines and principles were compiled in California in 1993, which were used to determine standard response time interval in order to make plan, organize and assess local emergency systems in emergency centers (7). There are different criteria for calculating standard response time intervals including the time of the first call by the caller, the time the phone was picked up by the operator, the time the authorized person for dispatching the ambulance spoke to the caller and the time the collected data was recorded in a computer to dispatch an ambulance. The first factor (the first call by the caller) is determined as the best starting point for response time interval (8).

Skinner (2008) stated that emergency service department is responsible for saving the patients in less than the standard time (less than eight minutes) before transferring the patient to the hospital. Emergency Centers (115 Medical Emergency Center) are responsible for transferring injured people and patients to the nearest healthcare service center and hospital from roads, houses, etc. (9). Patient transfer is an important factor in the cycle of provision of health care services to patients (transfer from the accident scene, house, etc. to either a hospital or a healthcare center). Patient transfer system requires proper management and monitoring including ambulance, human resources and equipment (10). Given the importance of emergency center in delivering immediate and urgent care services to the patients and since time management is a key element in service delivery to these centers, proper response and efficient time management in emergency department are important factors in successful high-quality patient care in order to improve patient care and health care system (11). Nowadays, timely patient transfer to medical centers by ambulances is an important issue because well-equipped and prepared
ambulances greatly save injured people and decrease mortality rates (12). Therefore, the present study assessed delay in response time interval to emergency missions and causes of delay in 115 prehospital emergency center in Khorramabad.

Methods
This was a descriptive, cross-sectional study in 115 emergency department with five centers in Khorramabad. One ambulance was studied as a research environment in each center. All emergency missions in the first six months of 2016 (n = 5431) were selected as the statistical population in order to calculate mean response time interval to emergency mission in 115 emergency center in Khorramabad and causes of delay in missions (missions lasting longer than the standard time). Accordingly, response time interval and causes of delay were assessed. Standard response time interval was determined as eight minutes according to previous studies.

The collected data was encoded using SPSS. According to the research objectives, causes of delay in missions were extracted from the software. The collected data was analyzed at three time intervals, namely less than eight minutes, between 8 and 10 minutes, greater than eight minutes. Response time interval to emergency cases was calculated within the interval from the first call to the center for requesting an ambulance (as the starting point) to technician arrival at the accident scene (as the end). In this process, the mission time interval was originally recorded by ambulance technicians. Then, the data was delivered to the operator via a wireless device. The operator entered initial data in the software designed for 115 emergency center. The mission was recorded in this software. Causes of delay in mission was also identified by the individuals authorized for dispatching the ambulance since they are fully aware and informed of the missions. Causes of delay in mission were recorded per shift. These cases were assessed and confirmed by the quality control unit in the next day.

Findings
Of 5431 patients, 3042 (56%) were females and 2389 (44%) were males. Mean age of the patients was 39.5 ± 13.5. In addition, 4063 missions (74.8%) were carried out in less than 8 minutes, 939 missions (17.3%) from 8 to 10 minutes and 429 (7.9%) in greater than 10 minutes (Table 1).

Table 1 – response time interval and frequency of missions in urban centers affiliated to 115 Emergency Center in Khorramabad

<table>
<thead>
<tr>
<th>Response time interval</th>
<th>Less than 8 minutes</th>
<th>Between 8 and 10 minutes</th>
<th>Greater than 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (percent)</td>
<td>4063 (74.8)</td>
<td>939 (17.3)</td>
<td>429 (7.9)</td>
</tr>
<tr>
<td>Total</td>
<td>5431 (100)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The content of Table 2 show various causes for delay in response time interval to emergency cases. In this study, frequency of causes of delay in missions were calculated.

The most frequent causes of long response time interval was dispatch of ambulance from areas other than nearby centers due to inadequate number of ambulances and route traffic. The less frequent cause of long response time interval was delay in sending the code by the operator (refer to Table 2).
Table 2 - causes of delay in response and frequency of delayed missions in the centers affiliated to emergency department in Khorramabad

<table>
<thead>
<tr>
<th>Cause</th>
<th>The number of missions</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispatch of ambulance from areas other than nearby centers due to inadequate number of ambulances</td>
<td>1585</td>
<td>29.2</td>
</tr>
<tr>
<td>Going to the wrong address</td>
<td>66</td>
<td>1.2</td>
</tr>
<tr>
<td>Delay in dispatch of an ambulance</td>
<td>11</td>
<td>0.2</td>
</tr>
<tr>
<td>Not dispatching the ambulance</td>
<td>5</td>
<td>0.1</td>
</tr>
<tr>
<td>Giving the wrong address by the caller</td>
<td>191</td>
<td>3.5</td>
</tr>
<tr>
<td>Unfavorable weather</td>
<td>314</td>
<td>5.8</td>
</tr>
<tr>
<td>Long distance</td>
<td>1194</td>
<td>22</td>
</tr>
<tr>
<td>Route traffic</td>
<td>1357</td>
<td>25</td>
</tr>
<tr>
<td>Unsuitable route (not well-asphalted and full of peddles)</td>
<td>56</td>
<td>1</td>
</tr>
<tr>
<td>Other causes</td>
<td>622</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>5431</td>
<td>100</td>
</tr>
</tbody>
</table>

It should be noted that the exact time of the mission was not available to the author. Therefore, mission interval was reported in frequency and percent.

**Discussion and Conclusion**

Since pre-hospital emergency care department is tied with societal healthcare service delivery (this department is essential in provision of immediate care services to critical patients in any society), immediate, efficient and effective care services save lives of many people and reduce both severity and length of illness and side effects of accident injuries. Therefore, time management is a gold standard in this department.

Given the importance of time management in pre-hospital emergency centers, a high percentage (25.2%) of missions were carried out in the interval greater than standard time interval (less than 8 minutes) although most of the missions were carried out within the standard time interval (in less than 8 minutes) in this study. These delayed missions were clinically significant. Jack Campbell (2007) also reported a mean response time interval greater than the standard time interval (9.8 minutes) (13).

Kleindorfer (2003) also reported that 93% to 97% of emergency missions were carried out within 10 minutes (14). Jack Campbell and Timothy Gridley (2009) also reported that response time interval was 8.2 minutes in 1059 of total 1945 missions (15). However, the standard response time to emergency missions was 8 minutes. Since early hours and minutes of response to emergencies are called golden hours, any decrease in response time interval
increases survival rate of the patients and consequently reduces mortality rate (16). Therefore, it is essential to address causes of delay in mission or increase in standard response time interval. The most important cause of delay in mission was dispatch of ambulance from regions other than nearby centers. This constituted a high percentage of causes of delay in missions.

Given that dispatch of the closest ambulance to emergency mission is one of the main strategies to improve emergency system (17), strategic distribution of ambulances and emergency service centers (based on the number of ambulance and received calls in a center) reduces the risk of dispatch of an ambulance from areas other than nearby centers, which ultimately reduces response time interval (18). Mohammad Rakei and Farouz Nader (2000) addressed that response time interval was greater than standard time due to inadequate number of ambulance and long distance between the accident scenes and emergency centers (19). Farzad Panahi also reported to Assembly Health Committee in 2008 that unsuitable geographic distribution of emergency centers is involved in response time interval to emergency cases. Accordingly, the emergency center can respond to an emergency case at the shortest possible time by increasing the number of emergency centers and ambulances in a center (20). Jarrell et al. (2007) also addressed the importance of ambulance distribution in emergency centers and reported that poor management in ambulance distribution leads to long response time interval to emergency cases (21).

Response time interval was greater than standard in densely populated areas due to crowded passages. This also increased the risk of dispatch of ambulance from centers other than nearby places. Therefore, it is recommended that the number of emergency centers and the number of ambulances in these centers be increased to overcome crowdedness in densely populated areas.

Route traffic is the second cause of greater than standard response time interval. Population density has increased and the culture of calling EMS has been promoted in modern society. Unfortunately, the number accidents have also increased dramatically in modern society. However, traffic and relevant problems have decreased efficiency and speed of ambulances in response to emergency cases. Therefore, traffic has increased standard response time interval to emergency cases in modern societies (22).

Ayrik Cuneyt (2006) reported that traffic is a cause of delay in transferring cardiac patients to the hospital (23). Shabghare (2008) reported that 39.6% of emergency missions lasted greater than standard response time (greater than 8 minutes) due to traffic (24). A report in an emergency center in Tehran in 2008 showed that heavy traffic causes failure of the emergency center to meet citizen demands in a timely manner (25). Alavi (2008) also reported that traffic affects standard response time interval to emergency cases (26).

Long distance is the third cause of greater than standard response time interval to emergency cases. Patient transfer should be monitored by the emergency system and the patients should be transferred to the nearest suitable medical center (27). Each emergency system should locate those medical centers well-equipped with diagnostic devices and excellent care services (including critical care) in order to transfer the patient to the nearest suitable center as soon as possible. This highlights the importance of distance in reducing response time interval to emergency missions (28). Shabghare (2008) reported that 34% of missions lasted longer than standard response time interval (21). Rakei (2000) also reported long distance as the cause of greater than standard response time to emergency cases (19).

Lynn Eaton (2007) studied the effect of distance on response time to emergency cases and reported 94.2% survival rate in distances from 0 and 10 km, 92.3% survival rate in distances from 11 to 20 km and 91.2% survival rate in
distances greater than 21 km. The greater the distance, the lower the survival rate (28). Ayrik Cuneyt also reported that distance is an important factor in response time interval to emergency cases. He reported that distance was involved in delayed transfer of cardiac patients to the hospitals (23). On the other hand, several strategies can be suggested to decrease response time interval considering causes of delays in emergency missions and the contribution of each cause in increasing standard response time interval.

Inadequate number of ambulances, abnormal distribution of emergency centers in urban areas, poor need assessment for the number of ambulance based on population density and public demand in every urban area, obsolete ambulances and equipment can be mentioned as the causes of delay in response due to dispatch of ambulance from areas other than nearby emergency centers and long distance.

Several strategies are proposed to resolve this issue.

a. Allocate adequate funds to Medical Emergency Department in the Ministry of Health for purchase of new ambulances and equipment.

b. Need assessment by experts to calculate the number of required ambulances in each center based on population density.

c. Division of densely populated and broad centers to several small centers

d. Standard emergency center distribution to reduce distance between neighboring centers and allocate more ambulances to densely populated areas and those areas with high requests for ambulance

Several strategies were also proposed to resolve traffic issue and timely response time interval to emergency cases.

a. Familiarity of emergency technicians with shortcuts, satellite GPS, radar, GIS, high-frequency waves and Trunking (automatic radio system) systems to find the best and most suitable route in emergency cases

b. Public training through mass media to cooperate with the emergency unit and ambulance.

c. Taking into account specific passages for ambulance in streets with heavy traffic.

d. Replacing ambulances with motor lances in old or crowded streets

e. Reforming old and destroyed routes with the help of civil engineers or reconstruction of old roads

Decrease in response time interval to 115 emergency missions require proper planning by policy makers in the Ministry of Health and Medical Emergency Department in Iran. Accordingly, more funds should be allocated to medical emergency department. Accurate need assessment should be performed for the number of required ambulances and emergency equipment and centers based on population density and public demand in every urban area.

Acknowledgments

The authors appreciate the helps of personnel of 115 EMS in Khorramabad.

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Reliability and validity of Persian version of Pervasive Developmental Disorders Screening Test-Second Edition (PDDST-II)

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Abstract

Background: Autism as the most severe developmental disability and Autism Spectrum Disorders” (ASDs) are neurobehavioral and cognitive disorders which are characterized by persistent impairments in reciprocal social interaction and communication across multiple contexts.

Aims: The present research aimed to evaluate the reliability and validity of Persian version of Pervasive Developmental Disorders Screening Test, the Second Edition (PDDST-II).

Method: the research was conducted in a descriptive framework. The population included a total number of 385 children, aging 1-4 years old, who were randomly selected among the Centers for Pervasive Developmental Disorders Screening and kindergartens in Tehran, Iran. Afterwards, mothers, experts and teachers in kindergartens completed the questionnaire on the basis of instructions and guidelines. The data were analyzed through Cronbach’s alpha and confirmatory and exploratory factor analysis.

Results: Results of Cronbach’s Alpha revealed that the questionnaire had a high level of internal consistency (0.925), which is considered as a high reliability. Examining the construct validity of questionnaire, the results of explanatory factor analysis showed that the values of 8 factors, out of 48 factors, were higher than 1 per cent. Also, it was represented that the percent of variances for these 8 factors could explain 10.275 % of total variance of variables and 80.27 % of the variances of all factors. In other words, the 8 factors were of more than 80 per cent accuracy.

Conclusion: factor analysis could confirm many of the items in Persian version of PDDST-II.

Keywords: Autism Spectrum Disorders, pervasive developmental disorders, reliability, validity, children.

1. Introduction

Autism Spectrum Disorders” (ASDs) are neurobehavioral and cognitive disorders which are are characterized by persistent impairments in reciprocal social interaction and communication across multiple contexts, along with the presence of restricted, repetitive, and stereotyped behaviors and interests (1). Autism is the most severe developmental disability. Appearing within the first three years of life, autism involves impairments in social interaction-such as being aware of other people’s feelings-and verbal and nonverbal communication. Some people with autism have limited interests, strange eating or sleeping behaviours or a tendency to do things to hurt themselves, such as banging their heads or biting their hands (American Psychiatric Association). The association has taken into account severity levels for autism spectrum disorder as following:

Level 1. Requiring support
Level 2. Requiring substantial support
Level 3. Requiring very substantial support

The abnormal development of children with autism and indicate that some of these children may read difficult texts in year four of their life but cannot manage their normal life issues such as self-protection (2). Beside autistic disorder, there are four other specific diagnoses included within the ‘autistic spectrum disorders’ (ASD) category, which is a term now preferred by most parents and professional organizations. Included among them are two disorders that are defined by a regression in skills: Rett syndrome and childhood disintegrative disorder. That is why screening and the role of the parents have become even more critical as we have recognized the stability of early diagnosis over time and the importance of early intervention. In other words, parent involvement is required to recognize when and how to respond to a child’s actions and behaviors, which can make it difficult to implement the program in the community. Sometimes, the child is very reserved and doesn’t pay attention to the people around them (3).
Autism is a developmental disorder defined in terms of qualitative impairments in social interaction and communication, and restricted, repetitive, and stereotyped patterns of behaviors, interests, and activities, with impairments which are more prevalent in male compared to the female (4).

Patients with autism suffer from lack of social interaction. Therefore, the appropriate treatment can be regarded as a method to help children with autism (5). Since the signs of autism are not diagnosable in early age, parents are to bear in mind that establishing social communication would be more difficult as their children become older (6).

Since children with autism display impaired communication, language, and reciprocal social skills along with stereotypic, repetitive behaviors, it can be beneficial to have social skills in order to enhance the children status and remove some of the obstacles they face in their life (6). Improving social skills for children with autism is more difficult compared to those without the disorder. Furthermore, the children with autism have impairment in social interaction or reciprocity.

Noting that children with autism display deficits in motor skills, it has been shown that stereotypic behaviors were very abundant in children with developmental disabilities. In addition, the children with autism are not inclined to display mental and physical reactions against their parents or peers’ favors (7).

Also, there is a severe and pervasive impairment in the stereotyped behavior, interests, and activities of autistic children (8). Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities are prevalent in children with ASD. The patterns are manifested by stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, eye-to-eye gaze or complex whole-body movements) persistent preoccupation with parts of objects (9, 10). Children with autism demonstrate "atypical" gaze or social "looking" and frequently manifest such stereotopies as eye pressing, hand flicking, and light gazing (11).

The salience of facilitating the social skill development of children and youth with autism has been increasingly recognized. Direct instruction, antecedent prompting, peer initiation, and peer tutoring have each been used successfully to increase social interactions between children and youth with autism and their socially competent peers. Early social interactions of children and youth with autism including the methods and procedures used by pediatricians, pysicians, psychologists and relatives would incredibly facilitate the social interactions between children and youth with autism and others. Dr. Eric Hollander, Director of the Autism and Obsessive Compulsive Spectrum Program at Albert Einstein College of Medicine/Montefiore Medical Center pointed that “people do much more active screening”, because early diagnosis and intervention will “speed up the developmental trajectory, so there is more intensive screening” (12).

It is very significant to mention that the early intervention program for very young children with autism- some as young as 18 months- is effective for improving IQ, language ability, and social interaction, a comprehensive new study has found. Early intervention can be helpful for preschool-aged children early intervention and the need for the earliest possible start (13). The present research aimed to evaluate the reliability and validity of Persian version of Pervasive Developmental Disorders Screening Test, the Second Edition (PDDST-II).

2. Methods

The research is a descriptive study which is to examine the validity and reliability of PDDST-II. Taking the permission of the test designer, the scale was translated into Persian by an expert in the field, which has been then rendered into English. To ensure the translation quality, both versions were given to five experts to answer the questions, about which all necessary instructions were given and they were asked to score the quality of the translation. Fluency of translation, using appropriate equivalents, applying suitable terms and avoiding technical words, transferring the meaning of original version and general quality of translation were the items to be considered with regards to translation quality. To measure the validity and reliability of the test, a sample of 385 children with no developmental delay, aging 1-4 years old, were randomly selected among the Centers for Pervasive Developmental Disorders Screening and kindergartens. To measure the reliability and validity of the scale, a sample with the size of questions number × 5 were selected (14).

2.1. Instrument

Pervasive Developmental Disorders Screening Test, the Second Edition (PDDST-II)

This is the first screening test which has been designed for recognizing all the spectrum of pervasive developmental disorders. The test is designed to aid in the discrimination of children with ASD from those with related non-autistic developmental disorders like mental retardation or communication disorders. The PDDST-II package includes three different parent or caregiver response forms and an examiner’s manual. The first stage is ‘Primary Care Screener (Stage 1-PCS)’ which is designed for use by pediatricians or family doctors and includes 22 items. The second stage is ‘Developmental Clinic Screener (Stage 2-DCS), which includes 14 items. The third stage ‘Autism Clinic Severity Screener (Stage 3-ACSS)’ has 12 items. The first and the second stages are applied to discriminate between the...
autistic children and those with milder or marked autistic spectrum disorder. The third stage is designed to aid in the process of discriminating autism from other PDD (15). Generally, the test includes 48 yes/no items which are to be answered in 60 minutes. The scoring system is based on cut-off point (16).

The reliability and validity of PDDST-II has been reported as following:

The Stage 1-PCS uses a cut score of 5 to optimize the hit rates for sensitivity at .92 and specificity at .91. The Stage 2-DCS also uses a cut score of 5 from a screen of 14 items based on optimal hit rates for sensitivity at .73 and specificity at .49. The Stage 3-ACSS uses a higher cut score of 8 from a screen of only 12 items. Using this cut score, the optimal hit rates are 0.58 for sensitivity and 0.60 for specificity (15). The reliability of this scale has been confirmed by (15) (16).

2.2. Data analysis

The research data have been analyzed through Cronbach’s alpha, confirmatory and explanatory factor analysis.

3. Results

Question 1:

Is the Persian version of PDDST-II reliable enough?

To measure the reliability of the test, Cronbach’s alpha and Pearson’s correlation coefficient were used, the results of which are presented in table 1:

Table 1. The Cronbach’s alpha for every variable and the total test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>0.925</td>
</tr>
</tbody>
</table>

As seen, the Cronbach’s alpha (0.925) is high and therefore acceptable for the questionnaire.

Table 2. The reliability coefficient for items of Persian version of PDDST-II

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean after item deletion</th>
<th>Variance after item deletion</th>
<th>Cronbach’s alpha after item deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>s1q2</td>
<td>43.9286</td>
<td>11.794</td>
</tr>
<tr>
<td>2</td>
<td>s1q3</td>
<td>44.1429</td>
<td>11.402</td>
</tr>
<tr>
<td>3</td>
<td>s1q4</td>
<td>43.7857</td>
<td>10.627</td>
</tr>
<tr>
<td>4</td>
<td>s1q5</td>
<td>44.000</td>
<td>11.069</td>
</tr>
<tr>
<td>5</td>
<td>s1q6</td>
<td>44.0429</td>
<td>10.771</td>
</tr>
<tr>
<td>6</td>
<td>s1q7</td>
<td>43.6571</td>
<td>10.169</td>
</tr>
<tr>
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<td>s1q8</td>
<td>43.9571</td>
<td>11.616</td>
</tr>
<tr>
<td>8</td>
<td>s1q9</td>
<td>43.6714</td>
<td>10.226</td>
</tr>
<tr>
<td>9</td>
<td>s1q10</td>
<td>43.7429</td>
<td>9.609</td>
</tr>
<tr>
<td>10</td>
<td>s1q11</td>
<td>43.9571</td>
<td>10.332</td>
</tr>
<tr>
<td>11</td>
<td>s1q14</td>
<td>44.1429</td>
<td>11.402</td>
</tr>
<tr>
<td>12</td>
<td>s1q15</td>
<td>44.0571</td>
<td>10.727</td>
</tr>
<tr>
<td>13</td>
<td>s1q16</td>
<td>44.0571</td>
<td>10.727</td>
</tr>
<tr>
<td>14</td>
<td>s1q17</td>
<td>44.0571</td>
<td>10.727</td>
</tr>
<tr>
<td>15</td>
<td>s1q18</td>
<td>43.8286</td>
<td>11.374</td>
</tr>
<tr>
<td>16</td>
<td>s1q19</td>
<td>44.4429</td>
<td>10.768</td>
</tr>
<tr>
<td>17</td>
<td>s1q20</td>
<td>43.8286</td>
<td>9.398</td>
</tr>
<tr>
<td>18</td>
<td>s1q21</td>
<td>44.0143</td>
<td>10.846</td>
</tr>
<tr>
<td>19</td>
<td>s1q22</td>
<td>43.9143</td>
<td>10.880</td>
</tr>
<tr>
<td>20</td>
<td>s2q1</td>
<td>43.3143</td>
<td>10.908</td>
</tr>
<tr>
<td>21</td>
<td>s2q3</td>
<td>44.0571</td>
<td>10.646</td>
</tr>
<tr>
<td>22</td>
<td>s2q4</td>
<td>43.8286</td>
<td>9.656</td>
</tr>
<tr>
<td>23</td>
<td>s2q5</td>
<td>44.0571</td>
<td>10.207</td>
</tr>
<tr>
<td>24</td>
<td>s2q6</td>
<td>43.8000</td>
<td>10.757</td>
</tr>
<tr>
<td>25</td>
<td>s2q7</td>
<td>43.8429</td>
<td>11.417</td>
</tr>
<tr>
<td>26</td>
<td>s2q9</td>
<td>44.0429</td>
<td>10.771</td>
</tr>
<tr>
<td>27</td>
<td>s2q10</td>
<td>44.2000</td>
<td>11.348</td>
</tr>
<tr>
<td>28</td>
<td>s2q11</td>
<td>43.7571</td>
<td>11.907</td>
</tr>
<tr>
<td>29</td>
<td>s2q12</td>
<td>43.7000</td>
<td>11.256</td>
</tr>
<tr>
<td>30</td>
<td>s2q13</td>
<td>44.1429</td>
<td>11.746</td>
</tr>
<tr>
<td>31</td>
<td>s2q14</td>
<td>44.1000</td>
<td>10.940</td>
</tr>
<tr>
<td>32</td>
<td>s3q1</td>
<td>44.1429</td>
<td>11.832</td>
</tr>
<tr>
<td>33</td>
<td>s3q2</td>
<td>43.6714</td>
<td>11.772</td>
</tr>
<tr>
<td>34</td>
<td>s3q3</td>
<td>43.6571</td>
<td>10.412</td>
</tr>
</tbody>
</table>
In the second stage, the validity of the test was measured using main factor analysis, the results of which are as following:

3.1. Suitable correlation matrix

The data matrix which is used in factor analysis should be meaningful, which is measured through Chi-square ($\chi^2$) and Bartlet test. It is to be mentioned that factor analysis can be performed if the chi-square and Bartlett's test of sphericity approx. chi-square are significant. The null hypothesis in Bartlett's test of sphericity is that the variables are only correlated to each other or in other words the correlation matrix is an identity matrix. If the $H_0$ is rejected, it can be inferred that the correlation matrix is significant and the factor analysis can be performed consequently. The test is called Mauchly's test of sphericity (17).

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is another method to assess the adequacy of the correlation matrices for factor analysis which provides an index (between 0 and 1) of the proportion of variance among the variables that might be common variance, viz. that might be indicative of underlying or latent common factors (18).

KMO is a way for assessing whether a set of variables is a correlation matrix is suitable for factor analysis, in which if the statistic yields high values above 0.7, then the correlations, on the whole, are sufficiently high to make factor analysis suitable. More care should be taken if these KMO values lie between 0.5 and 0.69 and KMO values below 0.5 mean that factor analysis would be inappropriate for that set of variables (19).

The data presented in table 2 show that KMO and Bartlet test are suitable for factor analysis because the KMO value is 0.922, which is above 0.7. The Bartlet test of sphericity, is addition, is considered suitable for factor analysis as there is high correlation among variables. Regarding the fact that the significance level of Bartlet test is 0.000, which is less than 0.05, it can be concluded that the $H_0$ indicating the correlation matrix is singular is rejected. Therefore, the results proved that factor analysis can be performed for research data.

Table 3. The results of tests of KMO and Bartlet

<table>
<thead>
<tr>
<th>Kmo Test</th>
<th>Bartlet Test of Sphericity</th>
<th>Degree of freedom</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.922</td>
<td>6436.397</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Afterward, the confirmatory factor analysis was performed in order to verify the factor structure of a set of observed variables. In fact, CFA is used to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. One common way of determining which factors to keep is to use a statistic called eigenvalue, which is a measure that attaches to factors and indicates the amount of variances in the pool of original variables that the factor explains. The higher this value, the more variance the factor explains. To be retained, factors must have an eigenvalue greater than 1 (19).

Table 4 shows the results of confirmatory factor analysis; as seen, among 48 factors in the questionnaire, 8 factors had eigenvalues greater than 1, which explained 10.275 per cent of the total variance. Nevertheless, the theoretical analyses showed 8 factors with eigenvalues higher than 1 that accounted for 80.27 per cent the total variance of all factors. In other words, the 8 factors were totally accurate for 80 per cent, in which the first factor with an eigenvalue of 6.189 could account for 18.75 per cent of the total variances in research variables.

Table 4. Communalities, eigenvalues and per cent of explained variance

<table>
<thead>
<tr>
<th>Factors</th>
<th>Eigenvalue</th>
<th>% of variance</th>
<th>Cum pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.189</td>
<td>18.753</td>
<td>18.753</td>
</tr>
<tr>
<td>2</td>
<td>4.631</td>
<td>14.034</td>
<td>32.788</td>
</tr>
<tr>
<td>3</td>
<td>4.112</td>
<td>12.460</td>
<td>45.247</td>
</tr>
<tr>
<td>4</td>
<td>2.950</td>
<td>8.941</td>
<td>54.188</td>
</tr>
<tr>
<td>5</td>
<td>2.543</td>
<td>7.706</td>
<td>61.894</td>
</tr>
<tr>
<td>6</td>
<td>2.467</td>
<td>7.745</td>
<td>69.369</td>
</tr>
<tr>
<td>7</td>
<td>1.936</td>
<td>5.866</td>
<td>75.235</td>
</tr>
<tr>
<td>8</td>
<td>1.664</td>
<td>5.042</td>
<td>80.277</td>
</tr>
</tbody>
</table>
To determine the number of factors, three factors including 1) eigenvalue, 2) per cent of explained variance and 3) rotated eigenvalues which is called scree plot, were taken into account. On a scree plot, because each factor explains less variance than the preceding factors, an imaginary line connecting the markers for successive factors generally runs from top left of the graph to the bottom right. If there is a point below which factors explain relatively little variance and above which they explain substantially more, this usually appears as an elbow in the plot. This plot bears some physical resemblance to the profile of a hillside, which is called Cattell’s scree. In other words, the scree plot is examined for a natural break between the large eigenvalues and the remaining small eigenvalues. The larger are the eigenvalues, the more significant would be the common factor; thus, the steep curve would facilitate the identification of common factor. The scree plot (diagram 1) shows that the first factor explained the most variance while the steep ends up from 8th factor on and the ‘elbow’ starts at the 15th factor.

Diagram 1. The scree plot for 34 items of the Persian version of PDDST II

The communality for 34 items of the questionnaire are represented in table 5. As seen, factor 23 had the least communality (0.485) whereas the factors of 15, 16 and 17 had the most communality (0.981). Other communalities lie within the spectrum of these factors.

Table 5. The communalities of items with factor analysis of principal components

<table>
<thead>
<tr>
<th>Item</th>
<th>Communality</th>
<th>Item</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.902</td>
<td>21</td>
<td>0.775</td>
</tr>
<tr>
<td>3</td>
<td>0.897</td>
<td>22</td>
<td>0.842</td>
</tr>
<tr>
<td>4</td>
<td>0.670</td>
<td>23</td>
<td>0.485</td>
</tr>
<tr>
<td>5</td>
<td>0.817</td>
<td>25</td>
<td>0.689</td>
</tr>
<tr>
<td>6</td>
<td>0.482</td>
<td>26</td>
<td>0.840</td>
</tr>
<tr>
<td>7</td>
<td>0.880</td>
<td>27</td>
<td>0.908</td>
</tr>
<tr>
<td>8</td>
<td>0.637</td>
<td>28</td>
<td>0.615</td>
</tr>
<tr>
<td>9</td>
<td>0.929</td>
<td>29</td>
<td>0.865</td>
</tr>
<tr>
<td>10</td>
<td>0.920</td>
<td>31</td>
<td>0.760</td>
</tr>
<tr>
<td>11</td>
<td>0.935</td>
<td>33</td>
<td>0.865</td>
</tr>
<tr>
<td>14</td>
<td>0.897</td>
<td>34</td>
<td>0.523</td>
</tr>
<tr>
<td>15</td>
<td>0.981</td>
<td>35</td>
<td>0.830</td>
</tr>
<tr>
<td>16</td>
<td>0.981</td>
<td>36</td>
<td>0.631</td>
</tr>
<tr>
<td>17</td>
<td>0.981</td>
<td>37</td>
<td>0.654</td>
</tr>
<tr>
<td>18</td>
<td>0.920</td>
<td>38</td>
<td>0.775</td>
</tr>
<tr>
<td>19</td>
<td>0.871</td>
<td>39</td>
<td>0.925</td>
</tr>
</tbody>
</table>

3.2. Extracting the final factors- Rotation

Once we know how many factors to use, we need to clarify which variables most ‘belong’ to each factor. Except when we have a single-factor solution (i.e. only one factor emerges) we expect that some variables will ‘belong’ to one factor and others will ‘belong’ to another. The initial extraction of factors does not make it clear which variables belong most clearly to which factors. Often, many variables will ‘load’ on several factors and some factors will have almost every variable loading on them. To clarify which variables belong to which factors, and to make the factors more interpretable, we go on to a third stage called factor rotation. Ideally rotation will result in factors on which only some variables load and in variables that load on only one factor. Table 6 shows the matrix of factor rotation, which plays a critical role in interpreting the results of factor analysis (19).

High loading variables ‘belong’ to the factor on which they load. The pattern of high and lower coefficients in the rotated matrix makes it much easier to see which variables belong to which factor. For example, the factor loading of
0.30 shows that the factor can explain 9 per cent of variance, based on which the factor analysis is considered appropriate. Therefore, in factor analysis for a sample of 100 persons, the factor loading of 0.3 and more is considered acceptable and significant. It is worth mentioning that if a variable loads relatively highly on two or more factors, we should include the variable in the factor for which it loads most highly.

Table 6. The rotated factor matrix through PC

<table>
<thead>
<tr>
<th></th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First</td>
</tr>
<tr>
<td>Q12S1</td>
<td>0.977</td>
</tr>
<tr>
<td>Q13S1</td>
<td>0.977</td>
</tr>
<tr>
<td>Q6S3</td>
<td>0.977</td>
</tr>
<tr>
<td>Q11S1</td>
<td>0.680</td>
</tr>
<tr>
<td>Q9S2</td>
<td>0.680</td>
</tr>
<tr>
<td>Q6S2</td>
<td>0.847</td>
</tr>
<tr>
<td>Q19S1</td>
<td>0.787</td>
</tr>
<tr>
<td>Q8S3</td>
<td>0.687</td>
</tr>
<tr>
<td>Q7S1</td>
<td>0.679</td>
</tr>
<tr>
<td>Q4S3</td>
<td>0.600</td>
</tr>
<tr>
<td>Q7S2</td>
<td></td>
</tr>
<tr>
<td>Q14S2</td>
<td></td>
</tr>
<tr>
<td>Q8S1</td>
<td></td>
</tr>
<tr>
<td>Q6S1</td>
<td></td>
</tr>
<tr>
<td>Q10S3</td>
<td></td>
</tr>
<tr>
<td>Q8S2</td>
<td></td>
</tr>
<tr>
<td>Q10S1</td>
<td></td>
</tr>
<tr>
<td>Q5S2</td>
<td></td>
</tr>
<tr>
<td>Q1S1</td>
<td></td>
</tr>
<tr>
<td>Q4S2</td>
<td></td>
</tr>
<tr>
<td>Q3S1</td>
<td></td>
</tr>
<tr>
<td>Q11S3</td>
<td></td>
</tr>
<tr>
<td>Q1S2</td>
<td></td>
</tr>
<tr>
<td>Q11S2</td>
<td></td>
</tr>
<tr>
<td>Q16S1</td>
<td></td>
</tr>
<tr>
<td>Q4S1</td>
<td></td>
</tr>
<tr>
<td>Q2S2</td>
<td></td>
</tr>
<tr>
<td>Q15S1</td>
<td></td>
</tr>
<tr>
<td>Q13S2</td>
<td></td>
</tr>
<tr>
<td>Q21S1</td>
<td></td>
</tr>
<tr>
<td>Q14S1</td>
<td></td>
</tr>
<tr>
<td>Q6S3</td>
<td></td>
</tr>
<tr>
<td>Q14S2</td>
<td></td>
</tr>
<tr>
<td>Q13S1</td>
<td></td>
</tr>
<tr>
<td>Q1S3</td>
<td></td>
</tr>
</tbody>
</table>

Having located the variables that go together empirically, we are to infer some conceptual communality from the empirical communality of the variables that load on a given factor. Regarding the second column of table 6, it can be said that Q9S2, Q11S1, Q6S3, Q13S1, and Q12S1 had high loading from factor 1, which indexed ‘paying attention to people’. In addition, factor 2 which indexed ‘stereotypic behaviors’ had high loading on Q4S3, Q7S1, Q8S3, Q19S1 and Q6S2. Moreover, Q8S1, Q14S2, Q7S2 on which third factor loads, indexed the (in column 4) ‘developmental delay’. Furthermore, the results showed that factor 4, which indexed ‘delay in manual dexterity’, had strong loading on four items of Q5S2, Q10S1, Q10S3, and Q6S1. Examining the sixth column, it can be said that Q1S2, Q11S3, Q3S1, Q4S2, and Q1S1 had high loading from factor 5, which indexed ‘verbal communication’. Also, factor 6, which indexed ‘attention’, had high loading on Q2S2, Q4S1, Q16S1, and Q11S1. Moreover, it is observable that Q14S1, Q21S1, Q13S2 and Q15S1 on which seventh factor loads, indexed the ‘unwillingness’. Furthermore, the results showed that factor 8, which indexed ‘nonverbal communication’, had strong loading on four items of Q1S3, Q13S1, Q14S2, and Q6S3.
The rotated factor matrix (table 7) shows that the eight extracted factors are highly related to the items and variables of the research. Table 7 shows the data in detail.

Table 7. The questionnaire based on the variables and factors

<table>
<thead>
<tr>
<th>Extracted factor</th>
<th>Items</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Q9S2, Q11S1, Q6S3, Q13S1, and Q12S1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Q4S3, Q7S1, Q8S3, Q19S1 and Q6S2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Q8S1, Q14S2, Q7S2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Q5S2, Q10S1, Q8S2, Q10S3, and Q6S1</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Q1S2, Q11S3, Q3S1, Q4S2, and Q1S1</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Q2S2, Q4S1, Q16S1, and Q11S1</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Q14S1, Q21S1, Q13S2 and Q15S1</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Q1S3, Q13S1, Q14S2, and Q6S3</td>
<td>4</td>
</tr>
</tbody>
</table>

Consequently, it can be said that the factor analysis has mostly confirmed the items of the model.

There are some indices in confirmatory factor analysis, based on which we can determine how well the proposed model fits the sample data. Also, the fitness of model is consequently measured. The main indexes are Chi-squared test, RMSEA, GFI, the RMR and the SRMR, which are explained in more details as following:

1. Chi-Square ($X^2$) and $X^2$/df ratio
   The Chi-square value is the traditional measure for evaluating overall model fit and, ‘assesses the magnitude of discrepancy between the sample and fitted covariance matrices’. A good model fit would provide an insignificant result at a 0.05 threshold (20). For models with about 75 to 200 cases, the chi square test is generally a reasonable measure of fit. But for models with more cases, the chi square is almost always statistically significant. Chi square is also affected by the size of the correlations in the model: the larger the correlations, the poorer the fit. For these reasons alternative measures of fit have been developed. An old measure of fit is the chi square to df ratio or $\chi^2$/df. A problem with this fit index is that there is no universally agreed upon standard as to what is a good and a bad fitting model. It is to be mentioned that as Chi-squared statistic is in essence a statistical significance test, it is sensitive to sample size which means that the Chi-square statistic nearly always rejects the model when large samples are used. In other words, when small samples are used, the Chi-square statistic lacks power and because of this may not discriminate between good fitting models and poor fitting models. Therefore, a statistic alternative that minimizes the impact of sample size on the model would be Chi-square ($X^2$/df), which is related to the degrees of freedom. A model with good fitness would have the ratio of chi square to df as 1.

2. Adjusted Goodness of Fit Index (AGFI): As GFI has downward and upward bias with small and large samples respectively, an omnibus cut-off point of 0.90 is traditionally recommended for the GFI; however, simulation studies have shown that when factor loadings and sample sizes are low, a higher cut-off 0.95 is more appropriate (20).

3. Incremental Fit Index (IFI): Values that exceed .90 are regarded as acceptable, although this index can exceed 1 (21).

4. Comparative fit index (CFI): Values that exceed .90 are regarded as acceptable.

5. Root Mean Square Error of Approximation (RMSEA): we can say that 0.10 is the cutoff for poor fitting models (22).

3.3 The confirmatory factor analysis for the Persian version of PDDST-II
Diagram 2 shows measurement model fit using CFA for the Persian version of Pervasive Developmental Disorders Screening Test, the Second Edition (PDDST-II). Since the value of $t$ is greater than 1.96, the output shows that all output numbers are significant.
Diagram 2. The measurement model for the Persian version of PDDST-II in significant numbers through CFA

Diagram 3 shows the measurement model for the Persian version of PDDST-II in standard estimation through LISREL output. Since the RMSEA is slower than 0.08, it can be inferred that the model has an acceptable goodness of fit.

Diagram 3. The measurement model for the Persian version of PDDST-II in standard estimation through

Table 8. The indices of goodness of fit through SEM

<table>
<thead>
<tr>
<th>no</th>
<th>goodness of fit</th>
<th>Anticipated values</th>
<th>Measured values of model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjusted goodness of fit index</td>
<td>0.9 and greater</td>
<td>0.92</td>
</tr>
<tr>
<td>2</td>
<td>Adjusted goodness of fit index</td>
<td>0.9 and greater</td>
<td>0.98</td>
</tr>
<tr>
<td>3</td>
<td>Comparative fit index</td>
<td>0.9 and greater</td>
<td>0.98</td>
</tr>
<tr>
<td>4</td>
<td>Root mean square of approximation (RM-SEA)</td>
<td>Lower than 0.023</td>
<td>0.023</td>
</tr>
<tr>
<td>5</td>
<td>$X^2$</td>
<td>In large size, it’s significant</td>
<td></td>
</tr>
</tbody>
</table>

The indices of goodness of fit through SEM for the Persian version of PDDST-II show that the model on the basis of confirmatory factor analysis has an acceptable goodness of fit, thus the model can be used for measuring the Persian version of PDDST-II.
3.4. The descriptive indices of research variables

Table 9. Descriptive statistics of research variables

<table>
<thead>
<tr>
<th>Extracted factor</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.00</td>
<td>10.00</td>
<td>506857</td>
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<tr>
<td>3</td>
<td>3.00</td>
<td>6.00</td>
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<td>3.00</td>
<td>6.00</td>
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<td>5.1857</td>
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<td>8.00</td>
<td>5.3857</td>
<td>1.36747</td>
</tr>
</tbody>
</table>

4. Discussion

As mentioned earlier, the research was aimed at evaluating the reliability and validity of Persian version of Pervasive Developmental Disorders Screening Test, the Second Edition (PDDST-II). To measure the reliability of the test, Cronbach’s alpha and Pearson’s correlation coefficient were used, the results of which proved that the test had an acceptable reliability for all variables as 0.925.

Afterwards, the construct validity of the test was measured through factor analysis, the results of exploratory factor analysis showed that that KMO and Bartlet test were suitable for factor analysis because the KMO value was reported as 0.922, which is above 0.7 as the standard level of qualification. Taking into account the fact that the significance level of Bartlet test is 0.000, which is less than 0.05, it can be concluded that the $H_0$ indicating the correlation matrix is singular is rejected. Therefore, the results proved that factor analysis can be performed on the research data.

The results of factor analysis showed that Q9S2, Q11S1, Q6S3, Q13S1, and Q12S1, indexing ‘paying attention to people’, had high loading from the first factor. Also, it was revealed that Q4S3, Q7S1, Q8S3, Q19S1 and Q6S2, on which factor 2 loaded, indexed ‘stereotypic behaviors’. Moreover, Q8S1, Q14S2, Q7S2 which indexed ‘developmental delay’, had loading from the third factor. Furthermore, the results showed that factor 4, which indexed ‘delay in manual dexterity’, had strong loading on four items of Q5S2, Q10S1, Q10S3, and Q6S1. The sixth column related to Q1S2, Q11S3, Q3S1, Q4S2, and Q1S1 had high loading from factor 5, which indexed ‘verbal communication’. Furthermore, Q2S2, Q4S1, Q6S1, and Q11S1, on which factor 6 loaded, indexed ‘attention’. Moreover, it was observable that Q14S1, Q21S1, Q13S2 and Q15S1, which indexed the ‘unwillingness’, had high loading from factor 7. Furthermore, the results showed that factor 8, which indexed ‘nonverbal communication’, had strong loading on four items of Q1S3, Q13S1, Q14S2, and Q6S3.

5. Conclusion

Regarding the validity of the test, items were accurately translated into Persian in order to make ensure of comprehensibility. Moreover, experts examined the translation and commented on the translated version for more accuracy with regards to the special terms. Therefore, the results were highly relevant to the items to extract the variables. In other words, factor analysis has mostly confirmed the items in the model.

Conflict of Interest:
There is no conflict of interest to be declared.

Trial registration: The trial is registered at the Thai Clinical Trial Registry (clinicaltrials.in.th) with the TCR identification number TCTR20160517001.

Acknowledgement: authors would like to thank Dr. Bryna Siegel for sending PDDST-II to researchers. we also appreciate the efforts and cooperation of The University of Social Welfare and Rehabilitation Sciences (USWRS) in Tehran, Mrs. Afshar, the head of Boomerang kindergarten, Tehran. In addition, We would also like to show our gratitude to Tehran Autism Centre, non-profit Primary Autism School of Ayeen Mehrvarzi and Autism Charity for all their assistance with research.

Funding: This research was supported by The University of Social Welfare and Rehabilitation Sciences (USWRS) in Tehran.
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The effectiveness of spiritual education on decreasing psycho-cognitive agitation (stress, anxiety, depression) in women with Multiple Sclerosis.

Maryam Zokaee¹, Bagher Ghobari Bonab², Hasan Ahadi³, Hamidreza Hatami⁴

Abstract

Introduction: Multiple Sclerosis (M.S) is one of the most common chronic diseases of central nervous system. The disease may cause numerous psychological maladjustment in patients with a high prevalence of depression, anxiety, and stress.

This study was conducted to investigate the effectiveness of spiritual education on psycho-cognitive agitation in women with Multiple Sclerosis.

Method: This research is semi-experimental study with pretest-posttest design and control group. 23 patients were selected among statistical population included women with M.S, and sample was divided into two groups as experimental and control groups.

The experimental group was instructed based on spiritual education, during 10 sessions, 90 minutes per session.

Data tool: demographic information, personal consent form, DASS-21 Questionnaire. Data were analyzed by using analysis of covariance and SPSS 21 software.

Results: The results show that all three variables of psycho-cognitive agitation were significantly decreased (p<0.05) in experimental group and were not changed in control- based on effective influence of spiritual effect on MS, in this study, this method can be considered as a complementary method with medicine.

Keywords: Spiritual Education, Psycho-cognitive agitation, MS disease, (stress, anxiety, depression)

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⁴
Introduction

Chronic diseases are effective in all life stages. In a way it infects not only the elderlies but also the young and middle-aged people. There is a close relationship between chronic disease and quality of life, and chronic disease can affect all aspects of the quality of life of a person (Rubin, 2001).

The specific characteristics of these diseases are its long-term nature and the uncertainty about the course of the disease, therefore, in addition to many efforts to treat, there is a great deal of cost (Smlemezzer et al., 2010). In recent years, the interest in evaluating and improving the quality of life of people with chronic illness has increased significantly, and improving their daily performance has become a serious target for health professionals (Shafiei fard et al., 2015).

Multiple sclerosis is one of the chronic and disabling diseases that causes many disabilities in young and middle-aged people (DE Liza, 1998). It is one of the most common neurological diseases and is a chronic, progressive and degenerative myelin of the central nervous system and involves brain hemisphere, visual acuity, brain stem and spinal cord. Symptoms of MS depending on which region of the central nervous system is affected, are variable and pattern of the disease varies from person to person (Tabriz et al., 2016). MAS is recognized by electrophysiological and spatial analysis techniques (Electrophysiological and Imaging studies) (Saduk and Saderk, 2003).

Clinical signs of the disease peak at the young age (20-35), the period in which the person has the most family, personal and professional responsibilities, and it faces difficulty in finding a job and financial security (Tavakoli et al., 2015).

Patients with multiple sclerosis have higher levels of psychiatric disorders than depression, stress and anxiety than healthy people (McCabe, 2005). In a way that about 48% of patients in the same year after the diagnosis experience symptoms of stress, anxiety and depression (Mitchell et al., 2005).

According to the high prevalence of MS symptoms, such as depression, anxiety and complications of drugs, using non-prescription therapies is necessary to reduce these symptoms (Mitchell et al., 2005).

Nowadays about one third of patients with MS use complementary therapies in spite of common treatments (Hayes & Cox, 2000). Depression disorder is among the top ten most important causes of disability and incapacity worldwide (Moin al-Gharbai et al., 2014), according to a joint report by the World Health Organization and the World Bank.

Depressed mood in these patients is often referred to as "distressed feeling" or "distraught", which may include feelings of indolence, sin, worthlessness, self-harm, and loss of consciousness (Kessler et al., 2005).

The concern is regarded as a chain of heavy, potentially uncontrollable negative thoughts and emotions (Beck, Rush, Shaw, Emery, 1979).

Anxiety refers to a person's reaction to a traumatic position, that is, a position under the influence of the increase of external or internal stimuli and the person is unable to control them (Chaplin, 1975, quoted by the Dadsetan, 2004). Anxious people change their heart rate, blood pressure and respiration. When an anxious person has an increased heart rate and increased blood pressure and breathing crisis (Dadsetan, 2004).

The term stress or psychological stress has been used in biology since Charles Darwin (1859), but the concept of stress entered the domain of social sciences and psychology for the first time in World War II in the United States (Hamdieh and Shahidi, 2008).

According to Lazarus and Fokkelman (1984), an anecdotal evaluation of a stressful event consists of two distinct parts: first, an initial assessment, in which individuals measure the situation, are interpreted at this stage by the
position and meaning that they will have. (Am I in danger?) After that, people enter the secondary assessment in such a way that they assess the resources available to deal with the situation. At this stage, people will test their ability to confront the event (Hosseinzadeh, 2007).

Spiritual health is one of the fundamental concepts in chronic diseases, which by creating meaning and purpose in life is considered as an important approach in promoting general health and quality of life. Spirituality, as the essence of being, is shaped into the journey of human life and is formed during various stages of life (Khodayari Fard et al., 2016). Religion and spirituality provide existential manifestations and can provide the means to cope with power, healing, and hope, and help individuals perceive their illness (Barton & Smith, 2010). In addition, spiritual health leads to the creation of healthy spiritual coping with stressful situations. The use of effective spiritual coping also helps mental health.

Spirituality supports the resurgence of the disease in chronic and acute conditions. Promotes co-operation during treatment and strengthens compliance with various diseases, the role of spirituality in health has been documented in patients with a history of severe symptoms and uncertain prognosis, such as cancer (Giovagnoli, 2006).

Many physicians have recently recognized faith and spirituality as an important source of physical health and well-being, so that they often find it essential to consider patients in the spiritual treatment process (Petat, 2012).

The importance of spirituality comes from the fact that spiritual needs and attitudes are considered to be the most inevitable and transcendent human needs (Campbell, 1981). Religion and spirituality are effective for physical and mental health (Riff, Liz, 1995). Spirituality is also a subjective, personal and affiliated concept that incorporates human immaterial aspects and experiences through man's relationship with God, himself, others, and nature (Khorrami Markaani, Yaghmaei, Khodayari Fard and Alavi Majd, 2011). Patients with chronic pain report that the use of spiritual or religious resources helps them to cope with pain (Argyle, 2001). Those who have spiritual health have their relationships in four personal domains (in relation to meaning, purpose, values of life and self-awareness), social (relationships with others), environment (relationship with environment and nature) and excellence (relationship with superior force) should be balanced. It is hypothesized that mental health improves through the creation of positive relationships in each domain (Dierandak, 2004).

According to some of the therapists and spiritual counselors, mental disorders are primarily caused by the individual's disregard for his subjectivity, and because our most fundamental need and inclining desire is to believe, submit, and faith in God. Therefore, when a person avoids God's obedience, there will be a variety of psychological-behavioral problems such as anxiety, depression, psychosis, aggression and social deviations. Several studies also indicate the role of religious beliefs and belief in spirituality in maintaining mental health and, on the other hand, the disability of religious faith in the development of various psycho-behavioral disorders (Lukoff 1998, quoted by Kahani Zari, 2015).

**Method**

**Research design**

This is a prospective research in terms of research design and in terms of its method, it is a semi-experimental research. The research population is consisted of 23 women aged 20-40 years old and volunteers selected among female members of the MS Society who were randomly assigned to two groups of 12 people. The entering criteria of the study were; over 2 years of illness, medication and informed and written consent for participation in studying.
and attending educational sessions, continuously and physically, mentally and cognitively; non-drug use; and alcohol and psychosocial drugs.

Exclusion criteria are the person's unwillingness to attend training sessions and being absent more than 2 sessions without prior informing.

The content validity of the protocol of spiritual education was confirmed by 7 faculty members of Tehran University and Kish International University and the moderator of Quranic sciences. The control and experimental group were asked to complete the DASS-21 questionnaire in the pretest.

**Description of the sample group**

In the present study, there were 23 participants, 12 of them in the experimental group and 11 in the control group (it was noted that the control group was also considered 12, however, one person in the post-test phase refused to cooperate with the researcher). The mean and standard deviation of the age of the experimental group were 34.41 and 7.06, and the control group was 34.27 and 1.75. The level of education of 5 participants in both groups was diplomas, 6 in the experimental group and 4 in the control group and one in the experimental group and two in the control group of the master's degree. The mean and standard deviation of the disease in the experimental group were 5.67 and 2.38 years, and the control group was 5.18 and 1.77 years.

**Research tools**

Data tool used in this study were demographic characteristics, DASS-21, Depression Scale, Anxiety and Stress Scale (DASS-21, Lovibond & Lovibond, 1995). A 21-item test was used to evaluate the symptoms of depression, anxiety and stress in a four-dimensional scale; A degree ranges from 0 to 3. This test consists of three sub-scales. Individual scores for each scale are measured in terms of seven items specific to that scale. Reliability and validity of this scale have been confirmed in numerous studies (Besharat, 2005, 1998). Cronbach's alpha coefficients reported a depression scale, anxiety and stress scores on the sample size of the general population (n = 278) 0.87 for depression, 0.85 for anxiety, 0.89 for stress, and 0.91 for the whole scale. This coefficient was reported for clinical samples (n = 194) 0.94 for depression, 0.85 for anxiety, 0.89 for stress, and 0.93 for the whole scale. These coefficients confirm the internal consistency of the scale to a good extent. It should be noted that the concurrent, convergent and differential validity of this scale has been confirmed (Besharat, 2005).

**Method of execution**

The method of this research, after completing written consent by patients and completing the demographic forms, were selected and randomly divided in two groups (control and experiment). All patients completed the DASS-21 questionnaire. The experimental group was trained in Spiritual Training based on the Paul and Smith model (2003) based on their relationship with each other, nature and God. At sessions 120 the participants were asked to carefully review the tasks that were designed by the researcher and related to the content presented at the meetings, and talk at the beginning of each session about their duties. After completing the spiritual training sessions for 2 months and a half, the DASS-21 questionnaire was repeatedly completed by the participants in both experimental and control groups. Data were analyzed by SPSS software (version 21) and statistical tests.

The content of the sessions was designed by a researcher and approved by the professors of spirituality. The meetings were as follows.
In the educational sessions that preceded the treatment sessions, participants were asked to review the Suras of Hashr, Vaq'e, Naba, Al-Rahman, Yasin and participate in the selected verses with the members of the group in each session.

Table 1: Summary of Spiritual Training Sessions

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Studying the relationship with oneself and others and the surrounding environment and expressing emotions to all individuals and situations that the person is in close proximity. (Life Cycle Study) Investigating and expressing the chanting of the verses of Khajeh Abdullah Ansari selected by the researcher and choices from al-Sajdah, verse 17 / al-Zariyat, Verse 22 / Al-Nahl, Verse 94 / al-An'aam, verse 155 / al-Baqarah / Verse 3</td>
</tr>
<tr>
<td>Second</td>
<td>Strengthening the self-consciousness of people and answering the question of who am I? Before and after illness, familiarity with the body is painful, the acceptance of the disease and the conditions governing it, and the expression of emotions and emotions. (Meditation) Selected expressions of selected Suras are selected by the researcher. Shura / Verse 31 / Al-Ankabot, Verse 56, and sentences from Khajeh Abdullah Ansari's verses.</td>
</tr>
<tr>
<td>Third</td>
<td>Visualization and creative imaging, self-knowledge, self-care education, relaxation techniques, and communication with God in techniques of visualization. Selections from Sahifeh Sajjadiyeh (communication with God) and selected sentences from Khajeh Abdullah Ansari from the Book of Mourning and Selections of Al-Ahzab, Verse 41 / Nisa, Verse 106.</td>
</tr>
<tr>
<td>Fourth</td>
<td>Peace of mind, control of negative thoughts, better communication with oneself and with God, forgiving oneself and others. Verses from Surah al-Ankonbot, verse 64, and Selected from Sahifa Sajjadiyeh.</td>
</tr>
<tr>
<td>Fifth</td>
<td>Connecting with others (friends, family, therapist, etc.), expressing individual emotions, creating positive self-esteem, mapping the communication cycle and expressing emotions and feeling for all people in this cycle, forgiving yourself and others. Selected from Sahifa Sajjadiyeh and verses from Ibrahim, Verse 11 / Anfal, Verse 61, Al-Imran, Verse 159 / Al-Nahl, Verse 42, Al-Ahzab, Verse 3.</td>
</tr>
<tr>
<td>Seventh</td>
<td>Mindfulness, presence in the moment, increasing accuracy and concentration, communicating with oneself, communicating with nature. Verses from al-osara', Verse 2 / Al-Imran, verse 173 / Al-Talagh, Verse 3 / Al-Nahl, Verse 99.</td>
</tr>
<tr>
<td>Eighth</td>
<td>Controlling of the situation and conditions, acceptance, transfer and surrender, training the control group: an examination of all the things that are under my control and the examination of all things that are not under our control. Selections from Sahifeh Sajjadiyeh are regarding acceptance and verses from al-Sajdah, verse 4 / al-mozammal, Verse 20 / Al-Nisa, Verse 33.</td>
</tr>
<tr>
<td>Ninth</td>
<td>Finding meaning in life and communication with God, reducing feelings of guilt. Verses from the verses of Al-rum, Verse 7 / Al-Zomar, Verse 66 / Al-Rum, Verse 46 / Al-zoha, Verse 11.</td>
</tr>
<tr>
<td>Tenth</td>
<td>Thanksgiving, examining all the valuable things in life, re-examining all the conditions that have been acquired despite the illness and leading to a positive change in life. (Review of the communication cycle and control cycle) (Acknowledgment letter). Verses from the al-Taghabon sura, verse 13 / hood, verse 123 / al-mozammal, verse 9, almaedeh, verse 11</td>
</tr>
</tbody>
</table>

Data analysis method

In this study, multivariate analysis of covariance has been used to analyze the results. This statistical method is one of the most appropriate methods to eliminate the effect of pre-test (Hooman, 2008, quoted by Shafiei Fard et al., 2015). It should be noted that SPSS21 software was used to analyze the data.
Findings

Table 1 shows the mean and standard deviation of the components of psychological distress (depression, anxiety and stress) in both the experimental and control groups in two stages of pre-test and post-test.

Using Shapiro-Wilk's formula showed that distribution of scores for all groups and in both pre-test and post-test and all three components, anxiety, depression and stress are psychological disturbances normal. Also, the results of the comparison of the mean scores of the three components of psychological disturbances by multivariate analysis showed that there was no significant difference between the groups in the pre-test (P >0.05, F (3 and 19) = 0.450) This suggests that the assumption of the pre-test variables of independence from the group membership variable is present in the present research data. Leven test also showed that depression error variables (P> 0.05, F (1 &21) = 0.339), anxiety (P>0.05, F (1 & 21) = 0.054) and stress (P >0.05, F (1 & 21) =0.002) were not significantly different in both experimental and control groups. Therefore, the assumption of equality of error variances was found in all three components of psychological disturbance among the data. The pre-test and post-test regression homogeneity tests in the experimental and control groups showed that the line difference between the pre-test and the post-test in the experimental and control groups for all three dependent variables is not relevant at the level of 0.05 ((P >0.05, F (1 &16) =2.884), and anxiety (P >0.05, F (1 &16) =0.244) and stress (P >0.05), F (1 &16) =0.809).

Multivariate covariance analysis was used to compare the effect of independent variable implementation (spiritual training) on dependent variable levels. The analysis of the homogeneity assumption of variance-covariance by the M. box statistic showed that the observed covariance matrices of the dependent variables were equal in the experimental and control groups (P = 0.424, F = 0.998, Box's M=7.411). The result of the Bartlett Spread Test with a degree of freedom of 5 was 28.675, which was significant at 0.001. The results of multivariate analysis of covariance showed that the linear combination of dependent variable levels (depression, anxiety and stress) was significantly different in experimental and control groups (partial η²= 0.638, Wilks Lambda=0/619 ,P=0.001, F (3 & 16)=3. 290). This finding suggests that the implementation of spiritual education at least at one level of the
dependent variable leads to a significant difference in the experimental and control groups. As a result, one-way covariance analysis was used to evaluate the effect of the independent variable on each of the levels of the dependent variable. Table 2 shows the results of one-way covariance analysis in comparing the components of psychological distress (depression, anxiety and stress) in the experimental and control groups.

Table 3: One-way covariance analysis in comparison of psychological distress components (depression, anxiety and stress) in two experimental and control groups

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Average squares between groups</th>
<th>Mean Error Counts</th>
<th>F</th>
<th>Significance level</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>130.684</td>
<td>15.187</td>
<td>8.605</td>
<td>0.009</td>
<td>0.792</td>
</tr>
<tr>
<td>Anxiety</td>
<td>85.993</td>
<td>8.171</td>
<td>10.524</td>
<td>0.005</td>
<td>0.866</td>
</tr>
<tr>
<td>Stress</td>
<td>65.537</td>
<td>9.969</td>
<td>6.574</td>
<td>0.020</td>
<td>0.679</td>
</tr>
</tbody>
</table>

Note: At all levels of the dependent variable, the degree of freedom of the group is equal to 1 and the degree of error freedom is equal to 18.

Based on the results of Table 2, the implementation of spiritual education caused all three components of psychological disturbance to be at least at a significant level of 0.05. The results showed that depression components ($P < 0.01, F (1 & 18) = 8.605$) and anxiety ($P < 0.01, F (1 & 18) = 10.524$) and stress component ($P < 0.05, F (1 & 18) = 6.574$), was significantly affected by spiritual training at 0.05. In addition, Benfarani's post hoc test showed that all three components of depression ($P = 0.01, SE = 1.684, \Delta \bar{x} = 939.4$), anxiety ($P < 0.01, SE = 1.235, \Delta \bar{x} = 4.006$), and the stress ($P < 0.05, SE = 1.364, \Delta \bar{x} = 3.497$) in the experimental group was reduced in comparison to the control group.

Discussion and conclusion

Chronic and debilitating MS disease can affect all aspects of the person's life and, as a result of the normal course of life, disrupt the family's life. Today, unlike the remarkable medical advances, the underlying cause and the way the disease is treated is still unknown (Seadatnia, 2005).

The physical and psychological problems associated with the condition of MS patients make them ineffective and worthless. They can establish a strong relationship with themselves, others, nature, and with God, and in the light of which they will find meaning for their lives, which is the result of preventing the damage from disease and adding resilience and resistance to life, if these people can strengthen the dimensions of spirituality.

The results of this study are consistent with Mortiso-tausurica (2011) that has examined spirituality education in patients with depression, and Kuzaki et al. (2010), who examined the effect of spirituality on depression and anxiety in adults. Baba'i (1395) who has studied the spiritual health and quality of life in depression in patients with thalassemia major. These findings are consistent with the results of research by Clon et al. (2011), Repinptop et al. (2005), Jeffrey et al. (2009) and Wachulz et al. (2013).

Elmer et al., by reviewing research that examined the effect of spirituality on health, showed that spirituality is associated with a lower rate of illness and longer life (Khodabakhshi et al., 2014). Spirituality along with religious forces such as prayers play an important role in the improvement of diseases, prayer and prayer is one of the ways in which the spiritual relationship between human being in need of God and the satisfaction of the Hajj and this relationship affects the acceptance of the disease and its acceptance. Hojjati and Taheri, 2010). These findings are consistent with the results of the studies by Poluma and Pendleton (1989) and Amir Fakhraei et al. (2012).
The purpose of this study was to investigate the effectiveness of spiritual education on psychological disturbances in women with MS. Findings of this study showed that spiritual education reduced the incidence of psychological symptoms in the experimental group.

One of the important constraints of this study was the condition of patients with MS who made them difficult to complete the questionnaires, and the environmental and family conditions affected their recovery process.

It is suggested that in subsequent studies, in addition to increasing the volume of samples, other psychopathology and various aspects of complementary therapies should be addressed.

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The Effect of BPS Intervention on Optimism in Patients with Type 2 Diabetes.

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Abstract:

Dispositional optimism is the expectation of positive outcomes in the future, and it can have a moderating effect on the neuroendocrinal changes resulting from stress in patients with type-2 diabetes. Best Possible Self (BPS) is a Positive-Psychology intervention which attempts to increase optimism by encouraging the patient to imagine and write about desirable outcomes. Method: The study sample included 60 individuals (30 in the control group and 30 in the experimental group). Every participant was a patient of the Tehran Medical Sciences University Endocrinology Clinic. The participants were chosen through simple random sampling. Materials: Study materials included the Revised Life Orientation Test (R-LOT) and the Positive and Negative Affect Scale (PANAS). These questionnaires were administered before the intervention and then again two week after the treatment. Results: The Analysis of Covariance (ANCOVA) method was used to determine the effectiveness of the treatment. Results suggested increased optimism in patients as a result of the BPS intervention. Conclusion: The BPS intervention increased the post-test optimism scores of participants, and the results were statistically significant, supporting the effectiveness of the BPS method.

Keywords: Best Possible Self, Optimism, Type-2 Diabetes

Introduction:

Diabetes Mellitus is widespread chronic disease affecting the health of millions around the globe. According to the Global Burden of Disease study, the number of type-2 diabetes cases worldwide increased from 333 million in 2005 to 435 million in 2015, constituting a 30.6% surge. In the same period, the number of deaths resulting from this disease climbed from 1.2 million to 1.5 million each year.

Due to the increasing prevalence of diabetes and its complex etiology, there is a mounting need to change the current focus of management for this disease from merely physical issues to include psycho-social factors as well. HbA1c has been a reference test for measuring blood glucose levels in individuals with diabetes for more than three decades. Furthermore, HbA1c levels are used for adjusting treatments and predicting the complications of chronic diabetes. An absolute increase of 1% in HbA1C levels is associated with a 15-20% rise in the probability of cardiovascular disease. Similarly, an absolute decrease of 1-2% in HbA1C lowers the rate of cardiovascular complications significantly.

Positive Psychology is a fresh perspective which places its focus on the important relationship between happiness, social institutions, personal capabilities, and a person’s health. Positive Psychology emphasizes the individual’s abilities and positive traits, believing the goal of psychology to be improving the client’s life and developing her internal talents. Consequently, issues such as individual happiness, creativity, emotional intelligence, wisdom, self-awareness, mental wellness, and optimism are stressed. Specifically, optimism, as an coping strategy, is one of the most studied subjects in Positive Psychology, drawing much attention from psychologists and health specialists. Optimism and positive expectations in response to the pressures of life and psycho-social hardships can result in healthy behaviours, healthier living habits, and a reduction in the occurrence of physical and mental illnesses. Most commonly, optimism is defined as dispositional optimism, the expectation of generally favourable outcomes in the future. Puig-Perez et al. (2017) suggest the positive effects of optimism are related to the psychophysiological
changes associated with stress. In patients with type 2 diabetes, cardiovascular responses to stress are reduced and levels of cortisol rise in the course of a day. Optimism can have a protective role in these patients, regulating the neuroendocrinal changes associated with stress.

Positive Psychology can increase wellbeing and reduce the symptoms of depression through easy and cheap interventions. One such treatment is BPS.

Per Meevissen, Peters, and Alberts (2011), the BPS method encourages individuals to envision a future in which everything has had the most optimal outcome. Various studies have shown that writing about and imagining the BPS can improve the mood and wellbeing of individuals. Furthermore, the BPS method can increase optimism by creating expectations for optimal outcomes. This effect is independent of BPS’s effect on mood.

Meevissen et al. claim that BPS means the patients imagining themselves as their “best possible self” in the future. The individual, keeping in mind her personal goals, attempts to envision herself in a world where all her goals, dreams, and capabilities have been realized, these goals and dreams can be personal, professional, or social. According to Liau et al. (2016), teaching BPS can act as a behavioural vaccine. King (2001) asked participants in his study to write about their best possible self for 20 minutes everyday for four consecutive days. The study’s results showed that writing about BPS, compared to other subjects, was associated with significant improvements in mood and wellbeing three weeks after the intervention and less disease five months afterwards.

The effect of Positive Psychology treatments on diabetic patients has not been widely studied. (Macaskil, 2016).

The BPS method was chosen for the current study due to its low cost, effectiveness, and ease of administration. There has been an increasing number of BPS studies on healthy individuals lately, but the method’s effectiveness among patients, specifically diabetic ones, has not been assayed. Therefore, this study has the goal of investigating BPS’s effect on patients with type 2 diabetes.

Methods

This was an applied study with a quasi-experimental method with experimental and control groups, a pretest and a post-test, and a follow up section.

Population and Sampling

The study population included all patients with type 2 diabetes in Tehran province. 60 individuals were chosen for the study sample, half were placed in the control group and the rest in the experimental group. All participants were patients receiving services from Tehran Medical University Endocrinology Clinic. The participants were chosen by random sampling.

Material

The Life Orientation Test – Revised (LOT-R): Scheier and Carver (1985) revised the Life Orientation Test (LOT) to use it for measuring dispositional optimism. The LOT-R can be used to evaluate individual differences in optimism and pessimism (this 10-item questionnaire assesses an individual’s expectations regarding life outcomes. Five items are positively expressed and the remaining five are negative). LOT-R is reported to have an internal reliability of over 80% by its developers.

Positive and Negative Affect Scale (PANAS): PANAS has 20 categories, half measuring positive affect and half negative affect. PANAS was created by Watson, Clark, and Tellgen (1988) to gauge positive and negative affect. It has two subscales, each of them with 10 items. Each question can be answered on a five-point Likert scale (1 = very slightly, 5 = extremely). The scores for a subscale can range from 10 to 50. The PANAS is a self-evaluation tool, and by changing the manual it can be administered as either a characteristic or positional test. Khodaee et. al (2016) reported PANAS’s Cronbach’s alpha as 0.85 and its reliability coefficient as 0.59.
Eysneck’s Personality Questionnaire (EPQ): Developed by Eyseneck and Cybil in the years 1965-67, it measures Introversion-Extroversion, Neuroticism, and Psychoticism. The neuroticism dimension on the EPQ evaluates emotional compromise and negative affects such as anxiety, aggression, and depression. Previous studies have found EPQ’s average validity to be around 0.83. The EPQ was translated for use in Iran by Barahni (1993). The translated questionnaire has 57 items. It has a reported test-retest validity of 0.84-0.94, a split half reliability of 074-0.91, and a Cronbach’s alpha of 0.81 (measure of internal reliability).

HbA1c test: This test is usually used to evaluate diabetic patients’ long-term blood glucose levels. This indicator reveals the average levels of blood glucose in the past 2-4 months. Since 2010, HbA1c has been used as a diagnostic tool with a cut-off point of 6.5% (48 mmol/mol) for a diabetes diagnosis.

**Procedure**

Sixty patients with type 2 diabetes were chosen using random sampling and placed in two groups of 30 (one experimental group and one control group) through random placement. In both groups the HbA1c, LOT-R, PANAS, and EPQ tests were administered. Three days before the first session, participants in both groups received the LOT-R, PANAS, and EPQ measures. Three days later, the sessions were held in a designated room. The participants in both groups received their instructions from examiners.

The individuals in the experimental group were instructed to write about their goals and dreams in the professional, personal, and social fields for about 20 minutes and to imagine their BPS for another five minutes afterwards. Furthermore, participants were told to repeat the exercise for five minutes a day for another two weeks.

It is important to add that the EPQ was only administered in the pretest to help with matching the two groups and controlling intrusive variables. Only the PANAS and LOT-R tests were repeated as a part of the post-test. The HbA1c test was repeated 3 months later.

**Results:**

Figure 1. Changes in Optimism, Teaching the BPS method was associated with higher optimism
(Figure 2). Teaching the BPS method was associated with higher positive affective

(Figure 2). Teaching the BPS method was associated with decrease HbA1c
The matrix of correlation coefficients shows a statistically significant correlation between study variables. The highest correlation was between the optimism and positive affect variables at 0.45. Positive affect had a positive correlation with optimism, implying that higher optimism was associated with higher positive affect. These increases were a result of the BPS intervention.

Negative affect and optimism had the lowest correlation coefficient at 0.33. The negative correlation suggests an increase in optimism was associated with reduced negative affect.

Table 2. Means and standard deviations for optimism and HbA₁c protein in the experimental and control groups before and after BPS treatment

<table>
<thead>
<tr>
<th>variables</th>
<th>groups</th>
<th>number</th>
<th>pre-test</th>
<th>post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Averaging</td>
<td>standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deviation</td>
<td>deviation</td>
</tr>
<tr>
<td>optimism</td>
<td>experiment group</td>
<td>30</td>
<td>27</td>
<td>3.75</td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td>30</td>
<td>25.45</td>
<td>3.97</td>
</tr>
</tbody>
</table>
Table 2 displays the optimism data for both the experimental and control groups before and after the experimental treatment. In the pretest, the experimental and control groups had a mean optimism of 27 and 24.45 respectively, with standard deviations of 3.85 and 3.97. Mean optimism in the post-test was 58.59 for the experimental group and 24.34 for the controls (SDs = 5.33 and 4.33).

The highest mean optimism score (58.59) belonged to the experimental group post-test, while the lowest mean score (27) was achieved in the pretest.

Table 2. Also displays HbA$_1$c levels before and after treatment. Before BPS, the experimental and control groups had HbA$_1$c levels of 7.74 and 7.75 and standard deviations of 2.27 and 2.13. After the intervention, HbA$_1$c levels in the control group remained virtually unchanged at 7.70 while patients in the experimental group had their HbA$_1$c levels drop to 6.5 (SD = 5.32). Highest HbA$_1$c levels (6.5) were measured in the experimental group post-test while the lowest levels (8.75) was measured in the PRE-TEST.

ANCOVA was used to evaluate the hypothesis that teaching BPS to patients would be associated with greater optimism. The experimental group’s mean score in post-test was compared to the mean score of the control group and the pretest mean scores were used as auxiliary variables. The homogeneity of regression curve was assumed. It is clear based on the data in table 3. That the interaction between group and the optimism pretest is not statistically significant, supporting the homogeneity Assumption.

<table>
<thead>
<tr>
<th>HbA$_1$c</th>
<th>experiment group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30</td>
<td>7.74</td>
<td>2.27</td>
<td>6.5</td>
<td>5.32</td>
</tr>
<tr>
<td>Control group</td>
<td>30</td>
<td>7.75</td>
<td>2.13</td>
<td>7.70</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Results of ANCOVA with single covariate for regression curve homogeneity in optimism post-test among the experimental and control groups

<table>
<thead>
<tr>
<th>Indexes</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>56.70</td>
<td>1</td>
<td>56.70</td>
<td>1.259</td>
<td>0.272</td>
</tr>
<tr>
<td>Pre-test of optimism</td>
<td>16.300</td>
<td>1</td>
<td>16.300</td>
<td>0.362</td>
<td>0.272</td>
</tr>
<tr>
<td>pre-test group×</td>
<td>22.155</td>
<td>1</td>
<td>22.155</td>
<td>0.492</td>
<td>0.489</td>
</tr>
<tr>
<td>Error</td>
<td>1170.82</td>
<td>26</td>
<td>45.032</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>18675.0</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4. ANCOVA with multiple covariates performed on two groups after BPS treatment
The findings displayed in table 4 display statistically significant differences between the optimism scores of the experimental and control groups. Furthermore, the difference between the pretest and post-test scores of the experimental groups is significant as well. According to the data, approximately 57% of the individual differences in optimism post-test scores was associated with the BPS treatment, with no possibility of a type 2 error. The Wilks Lambda 1 test was used to ascertain the statistical significance of the post-test differences at 99% certainty. (*F*=7.32, *P*<0.01, *Etta*=0.57).

Table 5. ANOCVA with single covariate on the HbA$_1$C test in the experimental and control groups

<table>
<thead>
<tr>
<th>Indexes</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th><em>F</em></th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test of HbA$_1$C</td>
<td>16.300</td>
<td>1</td>
<td>16.300</td>
<td>0.362</td>
<td>0.048</td>
</tr>
<tr>
<td>Group</td>
<td>8869.5</td>
<td>1</td>
<td>574.27</td>
<td>560.4</td>
<td>0.0005</td>
</tr>
<tr>
<td>Error</td>
<td>427.82</td>
<td>27</td>
<td>15.83</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>64197.0</td>
<td>30</td>
<td>45.032</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Based on the data in table 5, there is a statistically significant difference between the HbA$_1$C test results between the experimental and control groups after adjusting for other variables. HbA$_1$C scores in the experimental group were higher than the scores in the control group. This difference was statistically significant (*P*<5% and 1/27=0.65). The null hypothesis asserting there would be no difference between the two groups is rejected.

**Discussion and Conclusion**

In this study, the effectiveness of teaching the BPS method as a way of increasing optimism among patients with type 2 diabetes was evaluated. Type 2 diabetes can have a destructive effect on the mental and physical condition of patients. Complications caused by failing to control blood glucose levels, adverse changes in HbA$_1$C (glycosylated hemoglobin), anxiety, stress, and depression are becoming increasingly more common among diabetic patients. Efficient medical and pharmaceutical methods of managing high levels of blood glucose and its complications exist; yet high glucose levels are often associated with disability, early death, and widespread issues in social relationships. As diabetes and the economical issues associated with it become more common worldwide, researchers have been trying to find effective behavioural interventions to manage its symptoms.

Due to the relationship between chronic stress, insulin resistance, and metabolic syndrome, some studies have suggested treatments which include both psychological interventions and pharmaceutical regimes. Consequently, the behavioural-cognitive variables important to treating diabetes such as self-management, acceptance of disease,
positive affect, optimism, and motivation for treatment have all been part of various studies. In their study, Kim et al. (2017) found that optimistic women were more likely to learn and exercise. Furthermore, optimism was associated with lower incidence of high blood pressure, high cholesterol, type 2 diabetes, and depression. Optimism, as a personal characteristic, has a protective role against coronal artery disease. On average, diabetic individuals have lower life expectancy and optimism. Disruptive psychological factors such as negative affect and anxiety due to fear of blindness, cardiovascular disease, and kidney complications become more pronounced. These emotions reduce the optimism of diabetic patients and reduce rates of self-care. Optimistic individuals are more social, have better interpersonal skills, exercise more, and can easily create supportive social networks for themselves. Positive Psychology can increase wellbeing and reduce symptoms of depression by using low-cost and simple interventions. BPS is one such treatment method.

According to King (2001), BPS can be effective in reducing levels of negative affect and improve mood in times of trouble. Furthermore, King claims that teaching BPS can have a preventive effect on negative judgements among patients. BPS can increase optimism, positive mood and affect, and the individual’s motivation for self-care. Lo (2014) reported a significant decrease in negative affect in their experimental group after BPS was thought. Therefore, the current study’s authors attempted to use the BPS method for increasing optimism in diabetic patients. Optimism levels before and after the intervention were measured, and ANCOVA results supported the conclusion that BPS had a helpful effect on optimism levels. The experimental group’s post-test optimism scores were higher than the control group’s post-test scores, the difference being statistically significant. Similarly, the experimental group’s scores increased compared to their pretest. Furthermore, higher optimism in diabetic patients was associated with lower HbA1c levels compared to the pretest and the control group.

The findings suggest that BPS is an effective way of increasing optimism and match the findings of King (2001), Liau et al. (2016), and Lo (2014). The relationship between optimism, pessimism, and death is biologically and psychologically complex and heretofore completely unknown. However, various studies have shown that optimism can directly and indirectly increase positive health. For example, healthy behaviour is an indirect result of optimism. Optimism is associated with more healthy behaviours in seniors, including higher physical activity levels and smoking avoidance. Likewise, higher optimism is associated with having a better diet and less stress. The reduction in HbA1c levels among diabetic patients in this study can be related to this effect.

Optimism can have a direct effect on the neuroendocrine and immune systems. Additionally, it increases positive health behaviours, improves coping strategies, and promotes positive mood; these factors may have indirect effects on health outcomes. Recently, studies in the fields of optimism and health have led to a better understanding of mechanisms important in the management of chronic diseases. However, more research is needed in this field.

Therefore, the research question regarding the effect of BPS on optimism in diabetic patients is answered. BPS is associated with an increase in optimism levels.

It is important to note that this study’s findings require reproduction using a larger statistical sample. Furthermore, it is suggested that similar studies be conducted among populations with other chronic illnesses in order to strengthen the evidence in favour of this low-cost and simple Positive Psychology treatment.

References
Study of ABO Blood Types and RH among Patients with Gallstone
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Abstract

Background and objectives: Gallstone is a common health problems. Gallstone is a lump or stone formed in the gallbladder or in the bile duct. It may be caused by cholesterol deposition or an unbalance in bile constituents such as bile salts, lecithin and bilirubin. Several risk factors are involved in gallstone. A risk factors that is always important in many diseases is blood type. Therefore, the aim of this study was to evaluate the distribution of ABO blood types and RH among patients with gallstone.

Materials and Methods: This cross-sectional descriptive study was conducted on 327 patients with gallstones in 2015. A blood sample was collected from each patient and transferred to the laboratory to determine blood type. A checklist was also prepared based on the required variables including age, gender, BMI, grade one familial history of gallstone, first-degree familial history of cholecystectomy and hyperlipidemia. Data were analyzed using SPSS 19 and descriptive and inferential statistics. P<0.05 was considered significant.

Findings: Of the 327 patients with gallstones, 60.9% (199 patients) were female and 39.1% (128) were male. Of these, 31.8% (104 patients) had a blood type A, 19.9% (65 patients) had blood type B, 11% (36 patients) had blood type AB, and 37.3% (122 patients) had blood type O. Regarding RH, 91.4% (299 patients) of patients with gallstones had positive RH, while only 8.6% (28 patients) had negative RH. The highest frequency of gallstone was found in the age group between 40-49 years (127 patients), while the highest distribution of BMI was found in the 25≤BMI<30 range with 150 patients (45.9%). The highest frequency of blood type in men with gallstones corresponded to the blood type A with 53 patients (41.4%), while the highest frequency of blood type in women with gallstones corresponded to the blood type O with 74 patients (37.2%). Our findings showed that the highest BMI distribution in women with gallstone belonged to the 25≤BMI<30 range with 43.7% (87), while in men, it corresponded to the 25≤BMI<30 range with 49.2% (63 patients).

Conclusion: Frequency distribution of blood types and Rh in patients with gallstone is not uniform, which can indicate a correlation between blood types and the risk of gallstones. Men with A-positive blood type and women with O-positive blood type were found to be the most susceptible to gallstone.

Keywords: gallstone, Blood type, RH, ABO

Introduction

Bile is composed of water, cholesterol, bile salts, some proteins and bilirubin and is secreted by the liver. It is stored and concentrated in the gallbladder until it is needed by the body for fat digestion. In some cases, bile components form crystalline particles and turn into digestive glands and gallbladder stones. Gallstone is a common diseases among societies
and imposes considerable medical costs. The prevalence of the disease in European societies is 20%, while it is more than 50% among African Americans [1, 2]. Cholesterol is insoluble in water but dissolves in bile. Its levels in bile are higher than normal in many people, making bile completely saturated with cholesterol. This, in some cases, leads to the formation of cholesterol crystals. The gradual deposition of these crystals forms gallstones. The mechanism of formation of gallstones is quite known now; however, there is not enough knowledge about genes that increase the risk of the disease [3]. The obstruction of the gallbladder duct with stone is the underlying cause of the gallstones’ clinical signs. Several studies on the prevalence of the disease have determined that, in addition to environmental factors, genetic factors are also effective in the development of gallstones [4, 5]. The disease imposes significant health and economic costs on the health systems, even in western countries so that 10-20% of the European and American society are estimated to have gallstones [6, 7]. It is noteworthy that the annual treatment cost for biliary stones in the United States amounts to $6 billion, which, ranks second after acid reflux in terms of costs and burden of disease [8]. It has also been estimated that about one million new patients with gallstone are diagnosed every year in the United States [9]. The prevalence of gallstone is increasing, which may be due increased life expectancy and changes in dietary habits [10]. The prevalence of cholesterol gallstone has increased significantly particularly after industrialization and increased gallstone risk factors [6, 11]. In most cases, gallstone patients do not show noticeable symptoms, while about 25-50% of the patients face complications, where gallbladder removal is necessary. Acute cholecystitis is the most common complication of gallstone, which is due to dilatation and inflammation of the gallbladder due to obstruction in the cystic duct. Secondary bacterial infection occurs in 50% of cases, in which case, manifestation of multiple symptoms can be expected. Pain, nausea, vomiting and fever are common in the patients. Three hepatobiliary factors including bile supersaturation of cholesterol, reduced gallbladder contractions, and increased formation of nuclei by the cholesterol are the causes of the disease [12]. Other etiologic risk factors including age, sex, heredity factors, race, obesity, cirrhosis, intravenous nutrition, diabetes, high blood lipids, and hormones are also involved in the development of the above three factors [13]. A risk factor that is important and studied in many diseases is blood type. Correlation between ABO and RH blood types in some cancers such as colon, cervix, lung cancers, as well as blood cholesterol, uric acid, blood pressure, and many blood and gastrointestinal diseases has been investigated, which have yielded significant results. However, no accurate and reliable data on the correlation between ABO and RH blood types and gallstone is available. A risk factor that is important and studied in many diseases is blood type. Correlation between ABO and RH blood types and many diseases have investigated and yielded significant results. Gallstone is a common disease; therefore, it is very useful to investigate and identify the involved risk factors to prevent it and reduce the imposed burden of disease. ABO and RH blood type can be regarded a risk factor. However, there is a paucity of research on the association between blood types and gallstones. The few relevant studies have yield mixed results. For instance, Juvonen and Niemela studied the relationship between ABO blood type and gallstone but did not find a significant relationship. Similarly, in a study by Pandey on the association between ABO blood types and gallbladder carcinoma, the disease was found to be more prevalent among people with the blood type A and AB. Jesch et al. reported higher gallstone incidence in people with a blood type A. These findings urged us to conduct a study to investigate the correlation between ABO and RH blood types and gallstone.

**Methods**

This is a descriptive-cross sectional study that was conducted in 2015 on patients with gallstone who visited Peymanieh Hospital in Jahrom, Iran. The inclusion criteria included confirmed presence of stone through imaging. Patients who did not provide consent to blood sampling or use of their medical information were excluded from the study. In total, 327 patients were randomly selected and enrolled based on the inclusion and exclusion criteria. They were enrolled voluntarily by observing the principles of medical ethics after obtaining consent from all of them with full knowledge of the research process. A blood sample was taken from all patients and transferred to the laboratory to determine their blood type.
checklist was also prepared based on the required variables including age, sex, BMI, grade one familial history of gallstone, a first-degree familial history of cholecystectomy and hyperlipidemia. Data were analyzed using SPSS 19 and descriptive and inferential statistics.

Findings

Regarding frequency distribution of the blood types, 104 patients (31.8%) had blood type A, 65 (19.9%) had the blood type B, 36 (11%) had blood type AB, and 122 (37.3%) had blood type O (Figure 1).

![Distribution of patients by blood types](image)

**Figure 1: Distribution of patients by blood types**

In total, 299 patients with gallstones (91.4%) had positive RH, and only 28 (8.6%) had negative RH. Subjects were divided into six age groups, so that 7 (2.1%) patients were in the age group of less than 20, 56 (17.1%) patients were in the age group of 20-29, 61 (18.7%) were in the age group of 30-39, 127 (38.8%) were in the age group of 40-49, 37 (11.3%) were in the age group of 50-59, and 39 (11.9%) were in the age group of older than 60. Regarding gender, 199 (60.9%) patients were female, and only 128 (39.1%) patients were male. Also, 291 patients (89%) did not have high blood cholesterol, while only 36 (11%) of them had high blood cholesterol. In this study, out of 327 patients with gallstones, only 69 (21.1%) had familial history of gallstones, and the rest, i.e. 258 patients (78.9%), did not have familial history of gallstones. In the present study, BMI was divided into six ranges (BMI>18.5, 18.5≤BMI<25, 25≤BMI<30, 30≤BMI<35, 35≤BMI<40, and BMI>40) (Figure 2).
Figure 2: Distribution of BMI in patients with gallstone

The highest BMI distribution was found in the 25≤BMI<30 range with 150 patients (45.9%) and the lowest BMI distribution was in the 40≤BMI range with 7 (1.7%) patients. The distribution of BMI in other ranges is as follows: in 18.5≤BMI range 27 (8.3%) patients, in the 18.5≤BMI<25 range 88 (26.9%) patients, and in the 30≤BMI range 55 patients (16.8%). The most frequent blood type in men with gallstone was the blood type A with 53 (41.4%), while the lowest corresponded to the blood type AB with 12 patients (9.4%) (Figure 2). Blood type B with 15 (11.7%) patients, and blood type O with 48 (37.5%) patients had the second and third highest frequency. The highest frequency of blood type in women with gallstones corresponded to blood type O with 74 patients (37.2%), while the lowest frequency corresponded to the blood type AB with 24 patients (12.1%) (Figure 3). The blood type A with 51 patients (25.6%) and blood type B with 50 patients (25.1%) had the second and third highest frequencies.

Figure 3: Distribution of blood types and prevalence of gallstones in men and women
Of the 199 patients with gallstones, 171 (85.9%) had positive blood RH and 28 (14.1%) had negative blood RH, while all 128 men with gallstones had positive blood RH (Figure 4).

Figure 4: Distribution of RH blood types and the prevalence of gallstones by gender

The highest BMI distribution in men with gallstones was reported in the 25<BMI<30 range with 63 patients (49.2%), in the 18.5<BMI<25 range with 50 patients (39.1%), and in the 30<BMI<35 range with 15 patients (11.7%). The highest BMI distribution in women was observed in the 25<BMI<30 range with 87 patients (43.7%), while the lowest distribution corresponded to the BMI>40 range with 7 patients (3.5%). The 30<BMI<35 range with 40 (20.1%) and 18.5<BMI<25 range with 38 patients (19.1%) and BMI<18.5 range with 27 patients (13.6%) had the second to fourth highest distribution.

Discussion

Bile is secreted by the liver and stored in the gallbladder. It is responsible for absorbing fat and fat-soluble vitamins and releasing heavy metals, especially copper, from the body. Bile is an aqueous solution and consists of bile salts, cholesterol, phospholipid, water, electrolytes, and heavy metals, and contains proteins, IgA, vitamins and toxins. In some cases, different bile constituents form crystalline objects and gallstones. Gallstone is a common disease in many societies, which causes significant medical burden. In people with high cholesterol, bile is secreted increasingly, causing bile saturation and formation of stones. The location of the stones depends on its type. Most patients remain asymptomatic for a long time, while others often show biliary colic attacks. Biliary colic appears as a severe and persistent pain in the RUQ or epigastrium and sometimes spreads to the shoulder. The prevalence of gallstone depends on the geographical location, race, age, etc. [1, 2, 6, 14]. Several factors such as genetic and environmental factors are involved in the formation of gallstone [4, 5, 15]. A risk
factor that is commonly considered in disease development is blood type and Rh [17-16]. Correlation between ABO and RH blood types, blood cholesterol, uric acid, blood pressure has been investigated in some cancers such as colon, cervix, lung cancers as well as many blood and gastrointestinal diseases. Researchers related increased risk of gastric and intestinal cancer in patients with blood type A to the Forssmann antigen expression in these cancers. Forssmann antigen is structurally similar to the A blood type antigen. It probably attacks A antibodies due to their similarity to pre-cancerous and cancerous cells that produce this antigen [18-19]. People with A or AB blood types do not have this antibody, which makes them more susceptible to cancer growth and development. A similar mechanism may be involved for the development of gallbladder cancer in people with blood type A and AB. Therefore, in this study, the frequency distribution of ABO and RH blood types among patients with gallstones was examined. The following results were obtained. Of the 327 patients with gallstones, 60.9% were female, and 39.1% were male. The highest distribution was in the age group of 40-49 years old with 127 patients (38.8%), while and the lowest distribution was in the age group of less than 20 years with 7 patients (2.1%). The distribution in terms of gender and mean age was somewhat similar to the study by Juvonen. In that study, 171 patients with gallstone symptoms (39 males and 132 females) with a mean age of 56 years (between 21 and 87 years) were included [20]. Of these, 31.8% had blood type A, 19.9% had blood type B, 11% had blood type AB and 37.3% had blood type O. The distribution of the blood type in the Juvonen study (blood type A with 44%, blood type O with 31% and blood type B with 17%), Newton’s study (higher frequency of blood type A compared to the the blood type O in patients), and Pandey’s study (blood type A and AB were more common in patients with gallbladder cancer) are similar to the distribution of the blood types in the present study [20-22]. In terms of RH, 91.4% of patients had positive RH and only 8.6% had negative RH. This is consistent with the findings of the study by Pandey that reported 5.3% of the patients with gallstones had negative Rh [22]. The mean height and weight of patients were 165.58±9.411 cm and 71.23±14.022 kg, respectively. The highest BMI distribution was found in the 25≤BMI<30 range with 150 patients (45.9%), while the lowest BMI distribution was found in the 40≤BMI range with 7 patients (2.1%). Only 11% of patients had high blood lipids, while 89% had low blood lipids. Of the 327 patients examined, only 69 (21.1%) had familial history of gallstones. The frequency distribution of blood types by gender in patients with gallstones was studied here. Findings showed that highest frequency distribution of blood types in men with gallstones corresponded to the blood type A with 53 patients (41%), while the lowest gender distribution belonged to the AB blood type with 12 patients (9.4%). These findings are partly consistent with the study by Jesch et al. [23]. The highest frequency distribution of blood types in women with gallstones was in the blood type O with 74 patients (37.2%), while the lowest frequency distribution was in the blood type AB 24 patients (12.1%). Of the 199 patients with gallstone, 85.9% had positive blood RH and 14.1% had negative blood RH, while all 128 men with gallstones had positive blood RH. Findings showed that the highest frequency distribution of BMI in women with gallstones corresponded to the 25≤BMI<35 range with 43.7%, while the the lowest distribution corresponded to the 40≤BMI range with 3.5%. In men, the highest BMI distribution was in the 25≤BMI<30 range with 49.2%, while the lowest distribution was in the 30≤BMI<35 range with 11.7%.

Conclusion

Descriptive results of this study suggest a general correlation between blood type and RH and prevalence of gallstone. Blood type A in men and blood type O in women had the highest incidence of gallstone. Positive Rh in both groups corresponded to the highest incidence of gallstones. This asymmetric distribution can lead to an ambiguity about a significant relationship between blood type and gallstone. Extensive research and accurate tests are required to shed light on this subject. Another finding of the present study was that family history and blood lipids were not significantly correlated with the incidence of gallstone.
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Determining Health Organizational Behavior Indicators in a Military Organization

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Abstract
Aim: Organizational health indicators are of particular importance in military centers and institutions. The purpose of this study was to determine the indicators of organizational behavior health in a military organization.

Materials and Methods: The research method was descriptive qualitative in 2016. The population consisted of professionals and experts in the field of organizational behavior inside and outside a military organization. A total of 20 experts and professionals in the field of organizational behavior were selected using purposeful method using Delphi technique and a researcher-made questionnaire designed for organizational behavioral health. Kendall consensus coordination coefficient, Chi-square test, and Friedman variance analysis test for ranking components were analyzed by SPSS.22 software.

Findings: Recruitment (98%) and financial conditions (98%) as input parameters; long-term vision of the organization (92%), integrity (98%), technology level (100%), the level of innovation (100%), organizational culture (96%), learning capacity (94%) as indicators of process, and human resources developed with alternative power (96%) as output indicators of the health of organizational behavior were obtained.

Conclusion: The results indicate that among the health indicators of organizational behavior, average rating from the highest rank to lowest rank are: the level of technology, innovation and recruitment levels are more important than the other indices. By identifying organizational health status, deficiencies, weaknesses managerial abilities necessary to become clear, and prompted the organization to scientifically and expertly by employing the qualified people, recruiting them to communicate and use information, supporting for innovation, establishment of educational classes, organizational culture and contributions of persons could be significant steps to improve organizational health.

Keywords: health organizational behavior, indicators, armed forces, Delphi, qualitative research.

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Introduction

Today, organizations thought-out as independent identity as a living organism that has an importance of its members [1]. As they can interact with this new identity, and can effect on the employees' behavior. This identity could be consist of healthy organization or organizational issues [2]. Miles has defined organizational health in 1969. In his opinion, organizational health refers to survival of the organization in their environment and adapting with it and upgrade and expand their ability to compromise more [3]. An incorrect selection, misuse of skills, lack of proper atmosphere for prosperity could endanger the health and promote the organization. When people are given positions or posts that are not commensurate with the dignity of them, it leads to insubordination, absenteeism, delays and resigned. If in an organization, communication flow is not established as multilateral and open communication, at all levels there is no trust between different departments, and misunderstanding and disharmony is created. When goals are not clear, the ambiguity of purpose is created and therefore a concerted effort from the staff to achieve goals is not done.

Many managers found that organizational health, is economically growing. If they are an obstacle to growth, in fact, a large dam on the way to track their progress and their organizations will be created [4]. Thus, for the upgrade and improvement of organizations there is no choice except scientific knowledge and precise norms and organizational health indicators. Organizational health give managers framework and useful tool for analyzing and understanding and changing workplace organization [5]. Kaplan and Karavata achieved a model in this area which presented their organizational health indicators. Health Indicators organizations can be classified into three approaches: a) approach input indicators, process indicators approach, c) approach output indicators. Inclusion index in the approach, it is assumed that, if the inputs have healthy organization and the organization has the ability to absorb healthy input, we can ensure of the health of its performance [6]. A number of indicators that can be classified under this approach are: Ability to absorb qualified human resources: the ability of an organization in recruiting and developing good person, can be evaluated as an indicator of the health input [7]. Hire the right people, can reduce the impact on the environment [8]. The financial condition of the organization: Selection of appropriate personnel, paying for tests, interviews, staff recruitment, training and compensation is possible only when adequate and appropriate funding to support the organization have appropriate financial income [9]. Recipient Information: In today's organizations, information must flow faster than ever, even a short stop can lead to irreparable damage [10]. It should be noted that there is a bottom-up flow of information indicative of the success of the organization [11]. Successful organizations are those that are constantly learning and development capabilities to face new environmental conditions [12]. The level of innovation: innovation, modernization and adaptation to the environment is the most important symptom characteristic of a healthy system [13]. The level of technology: information technology enablers of the most effective in organizations. So that it can be claimed even if there are other enablers, without information technology, realizing a healthy organization will be incomplete or impossible [14]. Organizational culture: Organizational culture in the form of a set of beliefs and shared values that affect the behavior and thoughts of members and organizations, Can be used as a source of administrative to achieve a healthy environment considered [15]. The output indicator approach, it is assumed that if the process and inputs of organization consist healthy, can make sure of the health of its performance based on the following components. Profits or added value: The most important component in the index, if the organization used resources have the appropriate profitability is due to its organization health (contain small, 2002: 5). Customer satisfaction and loyalty: It can be said that among the clients and employees, building a successful relationship is the golden key to success, this relationship is an emotional relationship, not a relationship based on the experiences, We must understand that the client is not related to the organization but the organization is dependent on him [16]. Developing human resources with alternative power: indicates the capability of the organization in replacement of internal forces in posts that are empty due to retirement, resignation or dismissial [17].

Materials and Methods
The main research method in the analysis and presentation of results is a description of the survey methodology. The methodology involved examining libraries, meetings with experts and using the Delphi method. In this study, the health indicators of organizational behavior, after extraction from various sources of literature, were coordinated with military organizations. This work was formed by an expert team composed of 20 experts in the field of organizational behavior health research, and then held expert meetings and extracted indices. And finally was selected by health indicators of organizational behavior. Index selected were studied and analyzed statically again via questionnaires and surveys of experts and director of health research and statistical analysis organizational behavior and the indicators were extracted. The population of this study comprised of specialists and experts organizational behavior. The sample between experts and experts in the field of organizational behavior by selectively using the Delphi technique. Delphi Group is not dependent on the number of statistical power. But also with the dynamics of the group, it reach a consensus. Inclusion criteria in the professionals sample included in the sample, faculty members and experts in behavioral health who have at least a master's degree in human resource management, organizational behavior management, public administration, learning management, strategic management and management which was given to 41 people and 20 of it was finally completed. Exclusion criteria included the reluctance of professionals to cooperate and provide incomplete information respectively.

To collect data about the literature of the library are used. Therefore, by study of books, articles and research in Internet search and other researchers needed data were collected. According to the study, survey and field research is emphasized, like many similar descriptive studies were used intended to collect data in order to answer the research questions of the questionnaire and interview. The questions of questionnaire were closed type of questions and questions were measured by Likert scale.

The researchers' questionnaire Health Organizational Behavior: The questionnaire included health indicators obtained from the literature in the field of organizational behavior Which specializes in a range of very low (1) to very high (5) responded to it, and how well each of the indicators were assessed with the help of experts. To increase the validity of methods, questionnaire have been used such as methods like the use of professors Comments, specialists and management experts, study of similar questionnaires, papers, books and magazines, and primary distribution of questionnaires among a number of people. This means that each of these indicators in focus groups composed of 20 experts, were called one by one and any ambiguity examined in the items. If there is any bug in the wording or content of words and phrases, after an agreement with them, revised terms would be use. In the end, the obtained indicators were agreed and verified by all the experts. To investigate the reliability of health indicators of organizational behavior Cronbach's alpha was used. The results of the analysis showed that the internal consistency coefficient index is 69/0. This amount represents the appropriate reliability of these indicators.

To analyze the data, descriptive statistics (frequency, frequency) and Cronbach's alpha were used. Data were analyzed with the help of software SPSS.22.

Results and Discussion

The sample consisted of 20 experts in the field of organizational behavior health that make up the highest number of respondents experts, men with a frequency of 19 patients (95%) and the lowest prevalence of women in 1 patient (5%), The highest age 41 to 50 years with a lot of 10 patients (50%) and the lowest frequency of the age of 21-30 years, 1 patient (5%), 20-16 years of service with the highest frequency of 6 patients (30%) and the lowest frequency of service 1 person older than 30 years (5 percent), faculty with the frequency of 14 (70 percent) and non-academic members 6 patients (30%), the Academic, professor at the frequency of 11 (55 percent) and lowest frequency of Master 3 patients (15 percent), among fields of study, management institutional behavior with a frequency of 6 patients (30%) the highest and management field with a frequency of 1 patient (5%), the least among the elite field of study. Also, 20 out of a total elite, 10 cases had administrative post, 10 cases had non-managerial administrative post.

3-2- Process of study using the Delphi technique
First step: collecting information and expert discussion on the research team: According to the research literature and ideas, dimensions, elements and indicators of the health of organizational behavior were presented to a group. Health requirements for the study of organizational behavior based on research samples, two sources was characterized and determined as input for the study of health resources and principles of organizational behavior.

These entries are: A) The theoretical foundations: a review of the theoretical principles, theories and examples to help us to components, criteria and indicators that can be recognized for example, it is based on solid foundations and substantial scientific resources. So in the process of enumerating of the health of organizational behavior, measures were associated with the Military organization. B) Comparative studies: comparative studies help us to use maximum of the experiences and successes of leading organizations. At this stage any of the known health characteristics of organizational behavior was obtained from content analysis and then at a meeting of undergraduate of group members study was proposed and discussed, and a number of special features of Islamic Revolution of Iranian Revolutionary Guards were known and adapted during the discussions.

Second stage: Structured questionnaires were distributed among professional

At this stage, structured questionnaire was designed with 73 indicators, And distributed among professionals and the members of the group were asked to proportionality, transparency and integrity of each health dimensions to determine organizational behavior. Results obtained are as follows. After analysis, statistical summaries or titles and rank were prepared, resulting in the formation of a convergence of views between participants. And was distributed to modify the criteria and re-creating high agreement index among experts.

The third stage: correction factors according to the experts

At this stage, structured questionnaire with 73 indicators, was monitoring and re-distributed among professionals and the members of the group were asked to identify fit of each dimensions of organizational behavior health. At this stage collected opinions and specific questionnaire was prepared for each of the experts. This means that using the results of the second stage In addition to modifying variables, a column was added to certified personal results, and a column to the results of the expert. Then the participants were asked to re-review the answers and if necessary revise their opinions and judgments. In addition, his reasons mentioned about the lack of consensus and by taking Kendall compromise index of each title express its importance, Results are as follows:

Table 3.3: agreement coefficients of Organizational Behavior Health (second round)

The highest rate of agreement is about recruiting experts (94%) and the lowest rate is parity power (57 percent).

Step Four: modify index and redistribute questionnaire among professionals

In this phase, a structured questionnaire was designed by 52 index and was distributed in the third step among professionals. Based on the research questions, findings in organizational behavior health dimension, Component test results and identified indicators Organizational behavior health specialists is as follows.

The highest agreement rate of Experts is in the case of corporate culture (97%) and the lowest frequency is the level of technology (88 percent).

Step Five: comparing health experts about the organizational behavior

The experts results were evaluated in different phases of Kendall's Coefficient results are as follows:

Comparing the experts opinions about the components of organizational behavior (Delphi process). As the above table shows, the highest rate of expert agreement at each stage of organizational behavior, level of technology and the lowest frequency was capacity pervasive.
Using the Kendall deal correlation coefficient test statistics to measure the experts agreement, Friedman's chi-square test and analysis of variance test was used to rank the components. Friedman test results for ranking and Kendall's Coefficient of Organizational Behavior health Indicators are as follows.

The results of Friedman test for ranking in terms of health indicators of organizational behavior from experts view. The above test indicates that the difference among the ranks are not statistically significant (P>0.05). The above table shows that the average rank from highest to lowest rank are: The level of technology, the level of innovation, recruitment, financial conditions, long-term attitude in the organization, organizational culture, integrity, human resources development and capacity to learn with alternative power. Kendall's Coefficient is also a nonparametric test. And is used to determine the extent of coordination between comments. If Kendall coefficient is zero, it means complete disagreement and if it is one there is complete agreement. In the present study indicates agreement among experts on good factor is 63/0.

3-2-5- The validity of health indices of organizational behavior

To check the validity of obtained indicators about the health of organizational behavior, content validity and convergent validity were used. Validity actually shows how these indicators are close to what should be measured contently, that were verified by experts. The scale of organizational health Tamimi race (9) was used to search for convergent validity. The results of the convergent validity that the two questionnaire showed are highly correlated with each other. This solidarity is essential to ensure that the test measures what it should be measured. The correlation coefficient between the two questionnaires was r= 0.73 that was significant in the P<0.01. This result indicates good convergent validity of the questionnaire.

Conclusions

In this study, indicators derived from the theoretical foundations and elite are 52 index. Given that the implemented measures were very close to Kaplan and Karavata about indicators of organizational health model, and this model is the most comprehensive and most complete version of the model in the field, so the indexing and categorization of them were used.

Kaplan and Karavata model parameters can be divided into three main categories: (1) input indicators, process indicators and 3. 2. The output indicators. In input indicators approach, it assumes that if the inputs are healthy, and organization has the ability to have a safe input, we can ensure the safety performance of the organization. Input indicators include the ability to attract qualified human resources, financial conditions, and the recipient information, that among these three indicators, two indicators of the ability to attract qualified human resources and financial condition of the Islamic Revolution of Iranian Revolutionary Guards was approved. In explaining this result it should be said that the value of two confirmed indexes are fully specified for an organization such as the Iranian Revolutionary Guards. The recruitment of qualified financial and conditions of two indexes are pillars of an organization and military defense. According to a report drafted in 2000 by Joel and Levy, investing in People organization is a rational strategy for achieving and survival and stability of different levels of the organization. If these funds are valued, we have taken steps in the way of development, achieve goals, organizational commitment and survival of the organization [16] But recipients index information was not confirmed. It is also quite evident because the index maker involves the flow of information in organizations such as the Revolutionary Guards. Which is a military organization and much of the information have security labels in various categories and series, It is therefore expected that the flow of information in such an organization is far less than the normal flow, And in the best case, the movement of the upper echelons of command may be observed. It seems the index because of the organization and the importance of keeping information was not confirmed confidential documentation. However, it must be said that vital artery of the organization is communication network and information is bleeding in it. So in order to accomplish tasks, accordance with any changes in circumstances and major goals, modern organizations need a regular flow of information and forms of communication. The allocation of financial resources is increasing factors of organizational health and is guaranteed to improve your health in the working environment.
The third and final indicator is the output indicators. In the output indicator approach, it is assumed that if the inputs and processes have safe organization, by using the following components we can make sure of its operation. These components include the profit or surplus value, satisfaction and loyalty of clients and human resources is developed by alternative power. In the between these three factors as expected, the only developed indicator of human resources were approved by alternative power In the Iranian Revolutionary Guards. Because the two other indices commonly used for organizations and institutions that their financial and material benefits aspects has value. It was expected that such an index is not verified. Finally, the approved indicators are the ability to attract qualified human resources, financial conditions, long-term attitude in the organization, cohesion, learning capacity, level of innovation, technology level, corporate culture and human resources developed by alternative power. Among the limitations of this study it can be the limited studies in the field of organizational behavior health in Military organization, Limited availability because of the confidentiality of the results, the failure to build a tool to measure the health in organizational behavior, Due to the limited time and extent of the research, the lack of health assessment can be noted. It is suggested that such a study may also be performed in other military and defense organizations, and generally in commercial organizations. Because that such research was to raise awareness about the organization, and enhance and improve its functioning in the long term provides. Research findings by removing the confidential information to be identified research and conservation information with other professionals and researchers. So they too can benefit from it for scientific purposes. It is suggested that from the results of this research, a tool to measure health indicators of organizational behavior would be made. We also suggest that the health of organizational behavior after making the proper tools take place to measure the Military organization. It is recommended after making health organizational behavior, structure model and fitting of that also will be examined.

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Auditing Professional Code of Ethics by Nurses who work at Psychiatric Wards in University Hospitals in Tehran in 2016
Talieh Aliabadi¹, Jamileh Mohtashami², Foroozan Atashzadeh-Shoorideh³, Mohammad amin Pourhoseingholi⁴

Abstract

Background and Purpose: Ethics is a branch of the humanities whose object is to determine the value, in accordance with professional ethical standards in any group or profession. The ethical issues in psychiatric wards are higher due to care of patients with mental disorder. This study was designed to determine codes of professional ethics compliance in nurses with standards in psychiatric wards.

Methods: In this descriptive study (auditing), 100 electro convulsive therapies, 100 medication, and 100 cases of physical restraints was observed by sampling event in psychiatric wards of hospitals affiliation university of Tehran in 2016. Data were gathered through a researcher made checklist (codes of professional ethics compliance in psychiatric wards). Data analyzed using descriptive statistics and SPSS software version 19.

Results: Codes of professional ethics conformity rate with standards was 53.1% that evaluated the breakdown of compliance with codes of professional ethics in treatment by electro convulsive therapy 51.6%, in medication 49.3% and physical restraint 49.8%.

Conclusion: Codes of professional ethics conformity rate is far from the standards in psychiatric wards, and in order to improve it, recommended to apply the guideline codes of professional ethics and supervision by managers on its implementation.

Keywords: Professional ethics, nurse, auditing, psychiatric ward

Introduction

In today's world, ethics is again located in the spotlight of health-related professions (1). Ethics is a branch of the humanities that its object is to determine values (Right or wrong) in accordance with ethical standards in each group or profession (2). Although having the appropriate level of ethical development is important for all people, this issue is particularly important for health care personnel, including nurses (3) because they are the largest group that providing the services in the health care system (4), have a significant impact on the quality of health care (4,5) And certainly we can be said that the nursing profession is based on ethics principles (6).

Townsend explains: Ethical problems in psychiatry ward and psychiatric nurses is more due to care of patients with mental disorders (7). Studies indicate that two-thirds of psychiatric nurses experience a variety of ethical issues in Canada(8). At the moment, about 30 percent of the world population has been affected by a mental disorder that more than two-thirds of them did not get the care they need(9). Taking care of patients with mental disorders is very specialized and also requires obligation. Ethical complexity in the care of these patients have several reasons that the most important of them is that patient affected by experience and self-imagination and Suffering from psychiatric hospitalization due to stigmatization and loss of social rights (11). Psychiatric nurses daily encounter with various ethical issues and it is important to be able to evaluate fields and conditions that creating the unethical behavior (9). The codes of ethics help the psychiatric nurses to provide daily care to patients with considering the boundary between the independence and treat (12). Codes of professional ethics

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are the set of principles and standards that determine the behavior of individuals and groups and should be explained in any professional working during a rational process to provide a common understanding of the values that should be preserved and promoted in each organization (13).

Studies show different results in the field of regarding the professional ethics in psychiatric wards. The study of Rezai stated that some of the principles and terms of clinical care is not accurate in patients with psychiatric disorders and these principles are not covered enough by usual ethical considerations (14). In a research conducted in India, 67.8% of psychiatric nurses that have enough information in the field of professional ethics, and 66.7% of them that have degree in ethics from well-known college, faced with various ethical issues (15). Psychiatric nurses have many influence in using the ethics and laws during admission, discharge, appointments, providing the emotional and cognitive needs, and explain the problems to the patient, protecting the confidential information of patient and informed consent (16). In a study that was conducted in Jaipur of India, Only 10 percent of psychiatric nurses had enough knowledge in relation to ethical issues in the fields of psychiatry (15). Performing the professional ethics in relation with patients with mental disorders has been a social problem of the human society for a long time (14) that control and evaluation of this matter is the main tasks of managers so that the follow up of the evaluations will improve the quality of health care (17). Auditing is one of the best way to evaluate Codes of Professional Ethics in psychiatric wards.

Auditing is one of the important components of clinical governance program (18) and is a method of improving the evaluation of patient care quality (19). Auditing of patient care is a type of control that demonstrate current situation of the patient care that we can recognize the problems and dilemmas and implement the necessary planning in order to resolve it (20). Therefore the present research has been designed to determine codes of professional ethics compliance in nurses with standards in psychiatric wards.

**Method**

This descriptive study, is an auditing research that was conducted in the psychiatric wards of hospitals affiliation university Tehran (Razi, Iran, Imam Hossein, Taleghani, Ruzbeh and Rasul akram hospitals) in 2016. All nursing care related to electro convulsive therapy, medication and physical restraint in the psychiatric hospitals organize the samples. By taking into account the \( p=0.5, \alpha=0.05, \, d=0.1 \) and using the formula \( n = \frac{Z_{\alpha/2}^2 \times P(1-P)}{d^2} \), the required sample size calculated 100 cases. Sampling was performed from April to September 2016 by event sampling method with an observer (researcher), and by referring to the psychiatric wards in mentioned hospitals in three shifts, morning, evening and night. During sampling of the event, which dependents on the knowledge of observer about the special situation of the event, the observations happen in certain situation, thus observer should be present in that situation to record her observations(21). By considering that the number of referrals to psychiatric hospitals were different and by considering the number of active beds in each of these hospitals, observation were allocated to 38 events in Razi Hospital, 26 events in Ruzbeh Hospital, 18 events in Iran hospital, 8 events in Imam Hossein Hospital, 5 events in taleqani hospital and 5 events in Rasul hospital. Observations continued from the beginning steps of all three dimension (electro convulsive therapy, medication and physical restraint) to the end of work and documenting.

Collection data tool was the researcher made checklist that was designed by using the valid Persian and English articles and protocols and guidelines as well as nursing and psychiatry reference books published between 2006 to 2016. Demographic information such as number of patients, type of ward, and the number of personnel, work shift and gender is also studied. Checklist includes 45 phrases in three parts. The first part contains 17 phrases on professional ethics in the electro convulsive therapy. The second part consists of 13 phrases about professional ethics in medication and the third part contains 15 phrases about professional ethics in the Physical restraint. Each part evaluated the five ethical axis that include: respect, education, conscientiousness, commitment to justice and improve the quality of patient care. Scoring methods consist of two parts: 1. Yes, which consists of two parts: (A) Done right “(this part was scored when the care was done completely correct). (B) Do not right (this part was scored when the care was not done completely correct). 2. No, this part was scored when the care was not performed. The scoring is as follows: Not done (score 0), do not correctly (due to the low number: score 0) done right (score 1). Score range of checklist was determined from 0 to 100. To check the validity of the checklist, we used the content and nominal validity index. For this purpose, the phrases of the checklist were studied by 10 specialists, nurses and nurse faculty members to control relevance, clarity and simplicity content of the questions. To evaluate the reliability of the tools, we used Inter-rated coefficient method and ICC = 0.87 was obtained.
To perform this research, the ethics approval was taken from International Branch of Beheshti University of Medical Sciences with ethical code of IR.SBMU.RAM.REC.1395.63 and a referral was received from the Beheshti University of Medical Science and also the required coordination with the Training Unit of the university and head nurses of the psychiatric wards in mentioned hospitals was performed. Authorities were assured about confidentiality of information and trusteeship about using of the references. In order to analyze the data, we used the descriptive statistics of central indexes and distribution of SPSS v.19 software.

**Results**

In this research 100 events were observed in each dimension of study that half of the nurses were female and the remain of them were men. Codes of professional ethics conformity rate in men’s ward, 5.56% and in women’s ward 60.8% was desirable. Since this study has been provided on all shifts, the findings will be reported as follows; the codes of ethics conformity rate is 50% desirable in the morning shift, 30.3% in the afternoon shift and 6.4% in the night shift. In this research, findings showed that conformity rate in codes of professional ethics in psychiatric wards compared with the ethical standards is as follows: 51.6% in electro convulsive therapy, 49.3% in medication and 49.8% in physical restraint that in all dimensions of the evaluation was just average. The highest conformity level is recorded for the registration and documentation of events in all three dimensions of research that was evaluated desirably. The lowest conformity level have been reported as follows: In electro convulsive therapy related to the statement (it explains to the patient about possible occurrence of side effects) that was not observed in 75% of cases, In the medication related to the statements (it explains to the patient about potential drug side effects with simple words) that was not observed in 81% of cases, and in physical restraint related to the statements (it refuses the intimidating and threatening the patient during physical containment) that was not observed in 73% of cases.

In this research, any dimension is studied based on five ethical axis, the first axis is to respect for the patient, the second axis is to improve the quality of patient care, the third axis is patient education, the fourth axis is the responsibility, and fifth axis is justice. The findings based on mentioned five axis shows that the most conformity rate was in the fourth axis (responsibility) that reported desirable and the lowest of that, was in the third axis (training the patient) that reported poorly. Results of all axis conformity are available in table one.

Generally, based on the table 2, it can be said that in all three dimensions, electro convulsive therapy, medication, and physical restraint, the codes of professional ethics conformity rate with standards was 53.1% that reported as an average of score.
Table 1: Frequently distribution of the implementation of standards of regarding for the professional ethics codes in psychiatric wards, based on five axis professional ethics codes in psychiatric hospitals of Affiliation University of medical sciences and health services of Tehran in 2016

<table>
<thead>
<tr>
<th>Axes (respect to patient)</th>
<th>Dimensions of research</th>
<th>Done right</th>
<th>Do not right</th>
<th>Not done</th>
<th>condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>First axis</td>
<td>First dimension</td>
<td>256 (42.67)</td>
<td>28 (4.67)</td>
<td>316 (52.67)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Second dimension</td>
<td>143 (47.67)</td>
<td>2 (0.67)</td>
<td>155 (51.67)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Third dimension</td>
<td>149 (37.25)</td>
<td>2 (0.5)</td>
<td>249 (62.25)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>548 (42.15)</td>
<td>32 (2.46)</td>
<td>720 (55.38)</td>
<td>Average</td>
</tr>
<tr>
<td>(improving the quality of patient care)</td>
<td>First dimension</td>
<td>199 (66.33)</td>
<td>6 (2)</td>
<td>95 (31.67)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>Second dimension</td>
<td>107 (53.50)</td>
<td>1 (0.50)</td>
<td>92 (46)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Third dimension</td>
<td>346 (69.20)</td>
<td>0 (0)</td>
<td>154 (30.80)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>652 (65.20)</td>
<td>7 (0.7)</td>
<td>341 (34.10)</td>
<td>Average</td>
</tr>
<tr>
<td>(patient education)</td>
<td>First dimension</td>
<td>134 (33.50)</td>
<td>9 (2.25)</td>
<td>257 (64.25)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Second dimension</td>
<td>63 (21.00)</td>
<td>0 (0)</td>
<td>237 (79.00)</td>
<td>Weak</td>
</tr>
<tr>
<td></td>
<td>Third dimension</td>
<td>29 (29.00)</td>
<td>3 (3.00)</td>
<td>68 (68.20)</td>
<td>Weak</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>226 (28.25)</td>
<td>12 (1.50)</td>
<td>562 (70.25)</td>
<td>Weak</td>
</tr>
<tr>
<td>(responsibility)</td>
<td>First dimension</td>
<td>153 (79.50)</td>
<td>3 (1.50)</td>
<td>44 (23.00)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>Second dimension</td>
<td>218 (72.67)</td>
<td>4 (1.33)</td>
<td>78 (26.00)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>Third dimension</td>
<td>230 (76.67)</td>
<td>2 (0.67)</td>
<td>68 (22.67)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>601 (75.13)</td>
<td>9 (1.12)</td>
<td>190 (23.75)</td>
<td>Fine</td>
</tr>
<tr>
<td>(Justice)</td>
<td>First dimension</td>
<td>135 (67.50)</td>
<td>6 (3.00)</td>
<td>59 (29.50)</td>
<td>Fine</td>
</tr>
<tr>
<td></td>
<td>Second dimension</td>
<td>122 (61.00)</td>
<td>3 (1.50)</td>
<td>75 (37.50)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Third dimension</td>
<td>107 (53.50)</td>
<td>0 (0)</td>
<td>93 (46.50)</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>364 (60.67)</td>
<td>9 (1.50)</td>
<td>227 (37.83)</td>
<td>Fine</td>
</tr>
</tbody>
</table>
Table 2: code of professional ethics conformity rate with standards in the psychiatric hospitals of university of medical sciences and health services of Tehran in 2016

<table>
<thead>
<tr>
<th>Codes of professional ethics</th>
<th>Compliance(y/x)</th>
<th>Current situation(y)</th>
<th>Setting the standard(x)</th>
<th>Not done</th>
<th>Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code of professional ethics</td>
<td>53.13</td>
<td>2391</td>
<td>4500</td>
<td>2109</td>
<td>2391</td>
</tr>
</tbody>
</table>

Discussion and conclusion

In the present research, the conformity of professional ethics were evaluated as average (score 53.1) In recent years, numerous studies have been performed in this field. Among these present studies the result of Kumar et al. (2011) and Ghobadi Far and Mosalanejad (2013) were agree with this study.

In a study that performed by Kumar et al in 2011, that was evaluated to assess the knowledge of nurses about ethical and legal responsibilities in the field of Psychiatric (15), 90% of nurses had average knowledge that is agree with the evaluations of the present study. In the study of Ghobadi Far and Mosalanejad in 2013, that provided in order to determine the conformity of professional ethics codes in the medical staff of Jaron University of Medical Sciences, the professional ethics codes were estimated average (22). This study is also agree with current research.

Since the purpose of this study is to determine the conformity of professional ethics codes with standards in psychiatric wards, the results were compared to similar studies which investigated the conformity of the professional ethics codes from view of patients and staff. It is not agree with the results of Liang Su et al. (2012), Maarefi et al. (2014), Dehghani and Mohammad Khan Kermanshahi (2012), Tefagh et al. (2004). It seems that the reasons of the inconsistency is difference in research method. In this research, conformity of standards were observed directly that could be more objective and provide more credible data, while other studies were investigated view of participants.

Study of Su Liang et al in 2012, which have been provided to evaluate the attitude of the personnel about ethics and rights of patients in psychiatric hospitals in China's Shanghai, revealed that 87% of personnel feel the need of Ethics Committee. Only 11% of personnel were familiar with ethical codes (23).In the Maarefi et al 2014 study, which have been examined to determine conformity with codes of professional ethics of nursing, in the field of clinical service from view of patients, the average conformity with codes of ethical was reported 68.20% that is at a good level. In this study, it was not observed significant relation between demographic data of patients and their performance of professional ethics codes of nurses (13).

The results of study of Dehghani and Mohammad Khan Kermanshahi (2012), which have been provided to determine the observance of professional ethics codes in the performance of nursing in their view in Tehran University of Medical Sciences, Revealed that the majority of nurses (72.5%) have conformity performance with Code of Ethics (24).

In relation to the observance of professional ethics in the execution of medication orders by nurses, Tefagh et al have provided a study in 2004 that showed that highest percentage of nurses (49.6%) had poor performance in medication (25).

In the part of medication in this study , the observance of codes of professional ethics reported average that is agree with the study of Tefagh et al.

Probably, the reason of the result difference of this research with other research could be due to the difference in the research environment. Previous research was provided in all wards of the hospital while present study was provided specifically in psychiatric wards. In addition, the time of research could explain the difference in results, partly because, over the time, awareness of ethical issues of both medical staff and patients has risen and also approaches associated with the implementation of ethical codes (such as clinical governance and accreditation) have been implemented in the health care system. Results of some research suggest that despite the fact that health managers have an increasing emphasis on the importance of the codes of professional ethics, yet the conformity with the professional ethics codes is not an ideal. It seems that the cause of this problem have

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more important aspects of care and treatment of professional ethics codes like lack of control system for perspective of the health care personnel performance, heavy workload, low number of personnel and the high number of patients (26).

Moreover, the studies showed that receive appropriate health care services and providing health services based on respect for patient privacy and the principle of the confidentiality are the most important, and after that, achieving an efficient system of complaints Providing appropriate and adequate information for the patients, respect for patients' rights in deciding freely to receive the health services are important in health care recipients. (27).

Acknowledgments:

This study was derived from postgraduate 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.1395.63. 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.

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The Effect of Aerobic Exercise on a Cardiac Rehabilitation Period on the Capacity of Athletic Patients

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Abstract: Background and Aim: Cardiovascular disease is one of the diseases that has increased dramatically over the last few decades and is known to be one of the leading causes of death in the world. According to conducted studies, cardiac rehabilitation plays an important role in reducing mortality rates. This study was designed to investigate the effect of aerobic exercises during cardiac rehabilitation on the cardiovascular capacity of patients.

Research Method: This clinical trial was carried out before and after the cardiac rehabilitation center of the Peymaniyeh Hospital in Jahrom. Cardiac patients in this study were 24 open-heart surgery male patients with angioplasty disease in two groups, the experimental group (12 patients) and control (12 patients). This is a quasi-experimental study with practical purposes. In this study, the spss statistical software (version 16) was analyzed using t-test and correlation between two independent t-test groups.

Conclusion: The results of this study showed that the use of aerobic exercises in the cardiovascular system increases the cardiovascular capacity of the patients.

Keywords: Heart rehabilitation exercise, Sports Capacity

Introduction: Socio-economic development along with rapid urbanization has caused epidemiological changes in infectious diseases and malnutrition towards chronic non-chronic diseases (Shabani, 2010). Cardiovascular disease is one of the diseases that have increased in recent decades. (Assad, 2012). Today, cardiovascular disease is considered as one of the main causes of death in the world. In the United States, one in 2/8 deaths are due to cardiovascular disease (Assad 2012).

In 2010, in the United States, 397,000 patients undergoing coronary artery bypass graft surgery has been reported (Mozaffarian et al., 2013). 83.6 million American adults suffer from at least one type of coronary artery disease, of which 42.2 million are over 60 years of age (Mahdavi et al., 2015).

According to the International Center for Health Statistics, in 2012, in people over the age of 18, 6.8% suffered from heart disease, 4.5% had coronary artery disease and 21.2% had high blood pressure (Mozaffarian et al., 2013).
According to statistics released by the Ministry of Health, Medical Education and Medical Education, cardiovascular disease accounts for about 40% of all deaths in Iranian society (Mahdavi Urban, 2015). In other words, data show that of every 812 deaths that occur in 303 cases of heart disease (Siavashi et al., 2013). In Iran, over 2 million people are suffering from heart disease, of which 1,201 people die from the disease (Mozafari, 2015). It is estimated that more than 50% of all deaths in Iran are due to coronary artery disease (CAD) and the complications and consequences of this, according to forecasts, by 2020, this is reached to more than 75% of all deaths (Ghalamghash et al. 2008). Therefore, this disease is one of the most common causes of mortality (Mozafari, 2015). For this reason, interventions such as heart surgery and angioplasty have a relatively high prevalence (Ebrahimi et al., 2011). The treatment of this disease requires a lot of human and financial resources, and the medical treatment of multiple surgical procedures and psychological stresses on the patient and the family of patients can impose irreparable costs. The loss of physical, psychological and social performance due to cardiovascular disease can increase the risk of acute coronary syndrome and sequential hospitalization and cause functional and physical disability in patients. Research has shown that 90% of ischemic patients use regular and salty foods, 95.5% are habitually intake of tea and coffee, 40% have a history of smoking, 61% had a habit of consuming solid vegetable oil, 38.5% had used animal oils And 23% of housewives and 78% had no activity and 23% had used contraceptive pills (Solomon Zand et al., 2011).

Among the risk factors for cardiovascular disease, inactivity is associated with other risk factors such as high cholesterol and hypertension (Arti et al., 2012). Exercise and physical activity can be said to moderate these risk factors (Assad, 2012), so that even some research into physical inactivity, independent of obesity, is associated with inflammatory markers. Because of the importance of the subject and the socio-economic reasons, basic steps must be taken to prevent primary and secondary prevention (Eftekhar Sadat et al., 2009). Secondary prevention strategies include pharmaceutical and bipolar procedures, a cardiac rehabilitation program aimed at reducing secondary risk factors, hospital rehabilitation, improving functional status, and quality of life in patients, which can ultimately lead to delayed or reduced mortality in patients. (Lenon et al 2005). Due to the complications of surgery, unwanted inability, functional ability of patients is significantly reduced after surgery, therefore, participation in sports and rehabilitation programs is recommended to patients (Fallahi et al., 2011).

Heart rehab programs are designed with the goal of secondary prevention, including preventing subsequent consequences and reducing the progression of heart disease (Fallahi et al., 2011). The ultimate goal of heart rehabilitation is to restore and maintain the optimal physiological, psychological, social, and occupational status of a person (Solomon Zand et al., 2012). Since the emergence of the cardiovascular rehab program, sports activity has been one of the main components of this type of program. It is one of the main components of the

1 Coronary artery disease (CAD): A common cardiac disease in which coronary arteries are tight and narrow due to accumulation of fat and cholesterol.
2 Angioplasty: A treatment that is used to open the blocked arteries of the heart.
3 Acute coronary syndrome: An emergency situation characterized by a sudden onset of myocardial ischemia (heart attack).
program of cardiac rehabilitation and exercise activities (Gathini et al., 2013). It seems that the most commonly used exercise in cardiac rehab centers is a moderate intensity continuous aerobic training program that is highly recommended for increasing aerobic capacity or functional capacity and reducing the fat mass of cardiovascular patients (ghorobi et al., 2013).

Aerobic exercise improves cardiovascular fitness. Regular exercise involves some automated adaptations and physiology that increase cardiovascular function and increase aerobic exercise activity. The larger and stronger the heart contributes to increasing the volume and heart rate, while the heart rate below the maximum is less stressful for the heart. In a study, reviewing 148 articles in over 97,000 patients, rehabilitation based on physical activity significantly reduced the chance of re-admission patients and increased the quality of life in patients with heart failure and coronary artery disease (Anderson et 2014)

Therefore, aerobic exercise programs have a significant role in enhancing the physical function of patients with myocardial infarction and can increase their physical capabilities. Give participating in sports rehab programs, in particular, has a positive effect on the consumption of oxygen, aerobic power, and increased patient activity time. After angioplasty, patients often have no activity and are not being rehabilitated (Mozaffari et al., 2015). Muscular strength is essential for optimal person's performance, and muscle strength and subsequent exercise capacity are reduced in cardiac patients with ischemic heart disease. Muscle mass decrease Cardiac patients and subsequent coronary artery bypass surgery have been reported that the ability to change the body composition of patients as a muscle weakening agent (Mozafari et al. 2015) is reported. Participating in sports rehab programs has a positive effect on consumption of oxygen, aerobic power and prolongation of patients' activity. Therefore, it seems that the use of exercise in the rehabilitation of heart patients is not only expedient but also necessary. However, despite limited information, research on the effects of cardiac rehabilitation on these patients is low. On the basis of this, the researcher is considering that the effect of twelve sessions of rehabilitation on sporting capacity in Iran has been addressed; therefore, the need for this study has been felt to this end, one can answer the question: Whether using aerobic exercises in cardiac rehab would increase the risk factor for cardiovascular athlete's patients. It will examine risk factors such as blood pressure and heart rate, despite the fact that cardiac rehabilitation exercises and risk factors of cardiovascular complications existed about half a century, but up to So far less research into cardiac rehab?

Materials and methods:

In order to collect information from library studies, scientific articles as well as a laboratory research in the cardiac rehabilitation department of Jahrom Hospital have been used. The statistical population of the study included 24 men with cardiac surgery complications in the age range of 50 to 70 years, available and purposeful

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4 Coronary artery bypass surgery: if the amount of sweat is tight, in a dangerous location such as the main artery trunk, the needs for an artery bypass graft surgery
in both control group (12 subjects) and experimental group (12 subjects). Patients in the experimental group one to two months after the surgery at the heart rehabilitation center of the Peymremaniye Hospital in Jahrom, for one and a half months at 6 weeks, each week 2 sessions and 25-30 minutes each session had the rehabilitation exercise with monitoring of rehabilitation group. While the control group were exception to these sports programs. In order to measure the patients’ athletic capacity, two days prior to the start of the training and two days after the protocol was completed, the standard 6-minute run test was conducted so that patients run the 20 meter distance 6 minutes, and the distance traveled shows their sporting capacity. Subsequently, these measurements are also performed on the control group, with the exception that they don’t participate in special rehabilitation exercises.

Each rehab session lasted 25 to 30 minutes. The general coordinates of the exercise included: warming up, the main exercise program (aerobic training), cooling. The exercise program gradually increased in terms of the intensity and content of the movement's shape. The warm-up phase for 5 minutes included tensile main muscle groups, full muscle mass movements. The main exercise was performed for 20 minutes by walking on the treadmill or pedaling on a fixed bicycle with control of the duration of work and heart rate and blood pressure on the safe threshold. The recovery or cooling step for 5 minutes included slow motion stretching and alternate walking. An example of a session of the training program is shown in the table below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Warming up</th>
<th>Special exercise</th>
<th>cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time(min)</td>
<td>5</td>
<td>20</td>
<td>5</td>
</tr>
</tbody>
</table>

Members of the Heart Rehabilitation group:

1. Cardiologist
2. Occupational Therapist
3. Sports Physiologists
4. Physiotherapists
5. Dietitian
6. Social worker
7. Nursing teams
8. Psychologists

Findings
In this study, Kolmogorov-Smirnov test was used to determine the natural distribution of data and after confirmation of the normal distribution of data to compare the data before and after each group to examine the effect of the training on t-dependent test. Also, to compare the intergroup changes, the differences between the data before and after the calculation were first calculated and then independent t-test was used. A significant level was considered for all statistical analyzes (P <0.05).

**Anthropometric characteristics of subjects**

In this section, descriptive information about the characteristics of both experimental group (12 people) and control group (12 people) is presented in Table 2. Data included age, height, and weight and body mass index of subjects. There was no significant difference between the experimental and control groups.

<table>
<thead>
<tr>
<th>variable</th>
<th>group</th>
<th>Mean an standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>experimental</td>
<td>58±6</td>
</tr>
<tr>
<td>Height</td>
<td>control</td>
<td>63±5</td>
</tr>
<tr>
<td>weight</td>
<td>experimental</td>
<td>165±6</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>168±4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70±7</td>
</tr>
<tr>
<td></td>
<td>experimental</td>
<td>71±4</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis testing: The use of aerobic training in the cardiac rehabilitation period significantly increases the cardiovascular fitness of the patient.

<table>
<thead>
<tr>
<th>group</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Rate of changes</th>
<th>t-dependent values</th>
<th>Inter-group significance level</th>
<th>Intra-group significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>experimental</td>
<td>372±60</td>
<td>418±70</td>
<td>46.5</td>
<td>6.19</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table3: results t-dependent and non-dependent statistical test related to athletic capacity
The results in Table 3 show that the experimental group had a significant increase in exercise capacity and had a significant difference with the control group ($P = 0.01$). Accordingly, our zero assumption based on the lack of significant increase in the cardiovascular capacity of the patients is rejected, and the assumption of the decree on the significant increase in aerobic capacity of the patients is accepted.

**Discussion and Conclusion:**

After coronary artery bypass graft surgery, there are various physical and psychological problems in patients that are caused primarily by fear of movement and muscle weakness due to inactivity and following these problems, life and health of these patients are confused (et al 2012 Jarge). Most cardiac patients, especially patients undergoing surgery to increase cardiac output, preventing complications due to reduced blood supply to the heart muscle and encouraging the initiation of social activities, require rehabilitation interventions (et al 2014 Leung).

Studies have shown that physical exercise program as part of a comprehensive rehab program can improve the hardness of coronary arteries (market al 2003) and (smar et ac 2004).

The desired effect of endurance training on reducing the risk of cardiovascular disease has been shown in a large number of studies (Braith et al. 2008) and (leung et al., 2011). Activities that increase the amount of aerobic capacity have certain characteristics, which include muscle contraction and relaxation, especially large muscle groups, which are known as endurance and cardiovascular activities. In the early stages of walking practice, there is more benefit than other exercises (Askety Qashqai et al., 2010).

In cardiac patients, prolonged hospital admission or physical inactivity reduces muscle mass that reverses aerobic endurance exercises and increases the ability of the heart to withstand load pressure, and since the
number of mitochondria and oxidative capacity increases, reduces inflammation. The other effects of aerobic exercises are increased blood volume, which subsequently increases the volume and impact of heart attack and increases the ability to distribute blood in active muscles (et al 2002 Kavanagh).

All of these signify an improvement in functional capacity that results in activities such as climbing stairs or doing heavy homework and carrying objects can be done without symptoms of angina and shortness of breath. It is worth noting that this recovery is sometimes 5-25%, so an increase of more than 50% has been reported (et al 2007 Andreoli).

Consequently, controlled sports activities are recommended for the rehabilitation of these people and recommended by the sports centers. Sport activities play an important role in rehab and increase their ability to perform daily activities and return to their work place. A study that examines exercises on heart patients states that regular aerobic exercises are safe, and can also significantly improve lifestyle (Skethi Qashqai et al., 2011).

In the study, the patient's exercise capacity after rehabilitation had a higher mean than pre-rehabilitation exercise capacity, so it can be concluded that functional capacity of the patient has improved after rehabilitation, which indicates the beneficial effects of rehabilitation on the patients' sports capacity.

The dependent T test shows a significant difference in exercise capacity before and after exercise. Indicating improved functional capacity of patients after cardiac rehabilitation programs, while no significant differences were observed in the control group. The results of this study are similar with Mendik et al. (2012), which states that aerobic exercise has a beneficial effect on performance capacity, as well as Huang et al. (2010), Kainey et al. (2013), Dake et al. (2014) with the subject: effect of resistance and aerobic protocols on functional capacity and quality of life of the patients following Coronary Heart Disease, Andrewley et al. (2007), Grobee et al. (2013).

Conclusion

The results of this study showed that the use of aerobic exercises in the rehabilitation cardiovascular system increases exercise capacity of the cardiovascular patients.

References


Effect of Local Cold Application before and after Subcutaneous Enoxaparin Sodium Injection in Injection Site Pain and Bruising

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Abstract

Background and Object: Subcutaneous enoxaparin injection very often leads to various reaction such as bruising and pain in the injection site. Therefore, this study aims to investigate the effect of local cold application on occurrence of bruising and pain on injection site resulting from enoxaparin sodium injection in patients.

Investigation method: The method employed in this study is clinical trial for which 100 hospitalized patients in the Coronary Care Unit of Ayatollah Roohani teaching hospital in Babol were selected through convenience sampling. Patients in the study were divided into 5 groups (4 case groups and 1 control group). Injections for control group were administered by standard procedure (i.e. 10-second injection without cold application) for case groups local cold (ice and cold water compress) were applied 5 minutes before injection, 5 minutes before and after injection, 20 minutes after injection, and 5 minutes before and 20 minutes after injection for which 10-second rule was observed. Data was collated using a researcher-made check list which consisted of two sections: personal information and a section for recording bruising and pain intensity measurements. Size of bruises were measure 24, 48 and 72 hours after injection using a transparent millimeter ruler and pain intensity was measured using VAS visual scale which was done immediately after injection. Descriptive and inferential tests (independent T test and Chi-squared test) of SPSS 16 were used to analyze collected data.

Findings: The results indicated that there is a significant difference between control group and case groups in pain intensity and width of bruise after 24, 48 and 72 hours after injections and this difference was more noticeable for the case group which receive local cold application 5 minutes before and after injection.

Conclusion: The current study showed that cold application before and after subcutaneous enoxaparin sodium injection helps reduce pain and bruise width in injection site.

Key words: enoxaparin sodium, pain, bruise, local cold, subcutaneous injection

Introduction
One of the essential skills and nursing intervention is administering safe injection for patients. Injecting anticoagulants, in particular, is one of common nursing intervention which are administered widely for treating thrombosis. Of all anticoagulants, injecting Low-molecular-weight heparins such as enoxaparin has received increasing attention (Dod A’een, 2013). Enoxaparin is used for treating various conditions and diseases such as deep vein thrombosis (DVT) with or without pulmonary embolism, preventing DVT in abdominal surgeries, hip replacement surgery in which acute cases patients have very limited mobility, preventing unstable ischemic angina, myocardial infarction, and treating myocardial infarction which is treated medically and with the help of coronary interventions through skin (Chan, 2001). Therefore, enoxaparin is low-molecular-weight anticoagulant with a long half-life which is made through polymerization of heparin and is injected subcutaneously. Some medicine such as heparin are injected subcutaneously (Dehghani et al, 2012).

This type of injection causes bruises and pain in hospitalized patients. The pain from injection for long periods can cause fear of injection in patients and leads to their mistrust of nurses. Bruises in injections site creates some problems such as altering patients’ body image and fewer available sites on their body for subsequent injection (Abdikour et al, 2011). Therefore, pain is an emotionally unpleasant experience which is related to possible severe tissue damage (Correl, 2007) which can vary depending on pace of injection, type of medicine and amount of injected medicine (Chan, 2001). Medical practitioners believe that bruising and pain in subcutaneous injection sites is one of the main concerns among patients who need them for their treatment (Dod A’een, 2013).

As members of medical team, administering safe and accurate injections is one nurses’ duties and they not only need to be aware of side effects of medicine they use they should also use suitable strategies based on scientific proof in order to reduce potential injuries. Therefore, various methods have been investigated including tactile pressure to injection site prior to injection, apply cold to needle, injecting within a certain period of time, applying cold before injection and warming up the injection site after injection in order to reduce such side effects (Lili, 2010). Early studies in this area have started in 1991 and have continued until now. One such study is that of Chan which aimed to investigate the effect of duration of subcutaneous injection of heparin on pain intensity and bruising in injection site. Pain intensity was measured immediately after injection while bruising was measured 48 and 60 hours after injection. The findings of this study showed that pain intensity is low and size of bruises is smaller when 30-second injection method is applied (Chan, 2001).

A similar study done be Dehaghani et al (2012) showed that 30-second injection method reduces pain in injection site significantly. Dod A’een et al (2013) also found that enoxaparin injections administered in 30-second periods compared to 10-second injection method cause less pain and bruising. Zaybak et al (2008) investigated the effect of duration of subcutaneous heparin injection in 50 conscious patients over 20 years old who have been hospitalized in neurology, orthopedics and cardiology units of a hospital. The findings indicated that pain intensity and duration of pain was significantly reduced when 30-second injection method was employed. However, there was no different in these two variables between genders in two groups. Amanian (2013) found that applying cold prior to injection and warming up the injection site 12 hours after injection can help reduce pain. In another study which compared the effect of Emla Cream and cold compress 5 minutes prior to injection on pain intensity in enoxaparin injection, Farnia (2014) found that both interventions were effective in pain reduction. However, Rahmani Anaraki et al (2014) found that there was no significant difference in bruise width between control group and case group 24, 48 and 72 hours after injection. Chenick (2004) also showed that there was no significant difference between two methods of injecting enoxaparin (i.e. 10-second and 30-second methods) in terms of pain intensity.

Considering importance and necessity of prescribing anticoagulants for various patients, inevitable effect of side effects of such medicines in patients’ cooperation in continuing treatment, a large number of previous studies found contradictory results and mainly investigated various methods of reducing side effects of subcutaneous injections and few studies focused on amount of pain and bruising from enoxaparin injections and also the fact that previous studies on investigating the duration of cold application have not determined a standard period of time of applying
cold before or after injection and these studies have not investigated the effect of cold application, which reduces blood flow in injections site, pain and bruising resulted from injection.

Research methodology

This study was a clinical trial which consisted of five groups (1 control group and 4 case group) of patients conducted in Ayatollah Rouhani teaching hospital in Babol in 2015. Patients of the study were selected through convenience sampling and random allocation in various groups. Inclusion criteria consisted patients under 65 and over 18 years of age who were not pregnant or breastfeeding, received no injections 12 hours prior to test and were completely conscious and were able to clearly describe their pain. They need not to have any coagulation disorders and the amount of enoxaparin (6000 units) was the same for all of them. The number of sample group was decided to be 100, which was divided into 5 groups of 20 people, and was determined based on statistics consultant and using the formula for determining the size of sample population.

The researcher started sampling based on inclusion criteria and analyzed the side effects 24, 48 and 72 hours after injection. Injections for control group were administered without intervention using standard procedure in which injection was administered on left or rights side of the abdomen within 5 centimeters surrounding the navel on where 10-second method without massaging after injection was applied. j training was provided for the patients as not to manipulate the injection site. Cold compress (ice and water pack) were applied 5 minutes before injection, 20 minutes before injection, 5 minutes before and after injection and 5 minutes before and 20 minutes after injection in intervention groups 1 to 4 respectively. Data related to injections were recorded in a researcher-made check list by researcher’s trained colleague which consisted of age, gender, type of disease in the first section of check list and measurements of pain using VAS visual scale (ranging from 0 to 100 milimeter) ranging from painless to very painful. Pain intensity was measured immediately after injection using the visual scale of pain and 24, 48 and 72 hours later bruise width was measured and findings were compared. In order to measure bruise width, the nurse assigned for measurement used a transparent ruler and largest diameter of bruise width was determined by millimeter. It is clear that patients who were reluctant to cooperate and/or were discharged earlier than 72 hours were excluded from the study. Precision of pain intensity measurement based on visual scale, validity and reliability and sensitivity of this measurement tool were confirmed by intense, chronic and cancer-related pain in various studies (Dehghani 2012). Giveh’ee quoted from Boonstra that level of validity of this scale is around 76 to 86 per cent and its reliability is estimated from 60 to 77 per cent (Giveh’ee). Data was analyzed using descriptive statistics (mean and standard deviation) and inferential tests (T test and Chi-squared test) of SPSS 16 with significant level lower than p<0.05. It should be noted that this study was conducted with a permit from Office of research with project number () and security section of the hospital and prior to carrying out the study purpose of the study and its harmless nature was explained to all participants and their informed consent was obtained.

Findings:

Based on the findings descriptive statistics, the youngest participant was 26 years and the oldest was 65 years old. Average age of sample population was 54.66 and standard deviation was 8.603. Gender distribution of participants was equal at 50 per cent.

Based on the findings of Chi-squared test (600/3=2χ , Sig= 0.463) it can be said that zero can be assumed meaning gender distribution in two groups is equal. This means that there is no difference among the five groups in terms of number of male and female patients and they are identical (table1)

Findings of ANOVA variance analysis showed that level of significance (Sig= 0.562) is higher than 0.05 and therefore there is no significant difference in 5 groups in terms of average age of participants (table 2)

ANOVA variance analysis was also used in order to compare pain intensity in five groups of the study. Findings show that there is a significant difference in pain intensity in 5 groups ( F=2.255 , Sig= 0.044). This means that
assuming zero which means equal level of pain intensity in five groups is refuted and difference in this variable is significant among five groups (tables 1 and 2).

Table 1 - Descriptive statistics of pain intensity in 5 groups of the study

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>minimum</th>
<th>maximum</th>
<th>mean</th>
<th>standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>without intervention</td>
<td>20</td>
<td>0</td>
<td>4</td>
<td>1/40</td>
<td>1/602</td>
</tr>
<tr>
<td>5 minutes before injection</td>
<td>20</td>
<td>0</td>
<td>5</td>
<td>1/15</td>
<td>1/496</td>
</tr>
<tr>
<td>20 minutes after injection</td>
<td>20</td>
<td>0</td>
<td>7</td>
<td>1/05</td>
<td>2/038</td>
</tr>
<tr>
<td>5 minutes before and 20 minutes after injection</td>
<td>20</td>
<td>0</td>
<td>2</td>
<td>0/6</td>
<td>0/882</td>
</tr>
<tr>
<td>5 minutes before and 5 minutes after injection</td>
<td>20</td>
<td>0</td>
<td>2</td>
<td>0/2</td>
<td>0/615</td>
</tr>
</tbody>
</table>

Table 2 – Items in ANOVA analysis test (differences in pain intensity in 5 groups)

<table>
<thead>
<tr>
<th></th>
<th>sum of squares</th>
<th>degree of freedom</th>
<th>of mean square</th>
<th>F</th>
<th>level of significance of</th>
</tr>
</thead>
<tbody>
<tr>
<td>between groups</td>
<td>18/26</td>
<td>4</td>
<td>4/565</td>
<td>2/255</td>
<td>0/044</td>
</tr>
<tr>
<td>within groups</td>
<td>192/3</td>
<td>95</td>
<td>2/024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>210/56</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using ANOVA variance analysis and with repeated measurement of bruise width after 24, 48 and 72 hours after injection a significant difference between bruise width in group 2 (with cold application 5 minutes before injection) and group 5 (cold application 5 minutes before and after injection) because level of significance is lower than 5 per cent. In other groups, however, this difference is not significant (table 3 and 4).

Table 3 – descriptive indexes of bruising after 24, 48 and 72 hours in each group

<table>
<thead>
<tr>
<th>group</th>
<th>variable</th>
<th>No.</th>
<th>minimum</th>
<th>maximum</th>
<th>mean</th>
<th>standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>without intervention</td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>20</td>
<td>4/25</td>
<td>6/164</td>
</tr>
<tr>
<td></td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>50</td>
<td>6/1</td>
<td>11/79</td>
</tr>
<tr>
<td></td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>50</td>
<td>6/1</td>
<td>11/719</td>
</tr>
<tr>
<td>5 minutes before</td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>5</td>
<td>0/7</td>
<td>1/417</td>
</tr>
<tr>
<td></td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>10</td>
<td>1/4</td>
<td>2/722</td>
</tr>
<tr>
<td>20 minutes after</td>
<td>bruising time</td>
<td>20</td>
<td>0</td>
<td>5</td>
<td>0/6</td>
<td>1/569</td>
</tr>
</tbody>
</table>
Discussion:

Findings of this study indicated that there is a significant difference between two groups of men and women (t=3.039, p<0.05). Based on the data on pain intensity in women (1.43) and men (0.42) in can be said that pain intensity in women is higher compared to men; however, there is no significance difference in amount of bruising in two genders. Therefore, it can be concluded that women’s group have lower pain tolerance compare to men but bruising is not related to gender.

Findings of ANOVA variance analysis, used to compare pain intensity in 5 groups, showed that there is a significant difference in average pain intensity in 5 groups (F=2.25, sig=0.004). Pain intensity in control group was by far the highest. These findings are consistent with those of Rahmani et al (2014).

In their study, titled “Effect of Local Cold and Subcutaneous Enoxaparin Sodium Duration on Pain Intensity and Bruise at the Injection Site”, Rahmani et al (2014) reported 27.55 ± 38.66 pain intensity for control group and 16.17 ± 55.30 for intervention group with a 1.8 difference in pain intensity which is statistically significant. However, average pain intensity in intervention group is lower compared to control group and highest level of...
reported pain in control group is 100 while the highest in intervention group was 56 which is clinically a significant difference. This indicates that applying cold reduces pain in patients receiving subcutaneous injections. In current study the difference of pain intensity between control group and intervention group was statistically significant. In general, it can be said that two case groups receiving cold application (i.e. one with cold application 5 minutes before and 20 minutes after injection and the other with cold application 5 minutes before and 5 minutes after injection) equally experienced the lowest level of reported pain. These findings are consistent with those of Kuzu et al (2001) who investigated the effect of cold application on pain intensity and bruising in injection site of subcutaneous low-molecular-weight heparin in 63 patients. The findings of their study done on 63 patients for whom 4 different injection methods were used showed that applying cold before and after injection significantly reduces pain in injection site. It seems that the reason for contradicting results of the two studies mentioned above is in the use of cold compress before and after injections which resulted in longer painless experience. Therefore, current study confirms this by using both cold applications.

Repeated measurement of bruising of injection site 24, 48 and 72 hours after injection in variance analysis also revealed that there is a significance difference in average bruising in intervention groups (the ones using cold application 5 minutes before and after injection, and 5 minutes before injection) but this trend was not observed in other groups. However, in the study by Rahmani et al (2001), highest average bruising in intervention group was observed in the second 24-hour period and was almost equal to that of third 24-hour period and there was no statistically significant difference in bruise width between two groups in the second and third 24-hour. However, the findings of a study done by Varghese et al (2006) on 100 patients to investigate the effect of local cold application on pain intensity and bruising resulted from heparin injection showed that bruising trend gradually decreased starting from 12 hours and up to 48 and 72 hours after injection and this is also consistent with the findings of the current study. Another study done by Silvain et al (2012) done to investigate the effect of cold 5 minutes before subcutaneous injection of heparin on bruising and size of Hematoma found that there is a significance difference in size of Hematoma in injection site seen before applying cold between control group and intervention group and this is consistent with findings of Rahmani Anaraki et al (2014). It seems that contradiction between the findings of the studies and the current study is in the size of sample population (36 patients). Therefore, the researchers attempted to eliminate this restriction by increasing the size of sample population.

Conclusion:

The current study showed that local cold application reduces the size of bruises and pain associated with injection. Based on the results of this study, it seems that level of pain and bruising associated with injection in intervention groups receiving cold application 5 minutes before and after injection were the lowest. Therefore, in order to improve the quality of clinical care and minimizing unpleasant and stressful experiences the findings of this study can be used a guideline for reducing unpleasant side effects associated with subcutaneous enoxaparin and for training healthcare staff. These findings can also be used for clinical nursing in order to improve the quality of nursing performance and increase patients’ satisfaction and cooperation. There were some restrictions in conducting this study including the effect of patients’ cultural background and beliefs and everyday life on how they perceive and described their pain which cannot be controlled or measured.

References:


Abstract

Introduction: Females are more prone to genital infections than males and these infections develop more complications for females than males. No doubt the infections of the genital tract and consequently their complications are reduced in women by investigating their beliefs in this regard and drawing them to the facts based on the scientific evidence. Hence, this article attempts to explain the deep-rooted beliefs about causes and diagnosis their urogenital infections before Pregnancy in women.

Methodology: In this qualitative study, 144 women aged more than 80 years old who lived in the city of Neyshabur were recruited. The researcher in this qualitative study collected data using focus group and individual interviews. We used the proposed method of Lincoln and Cuba to evaluate and enhance the reliability and validity. Data analysis was performed by content analysis and AtlasT software.

Results: The findings of the present study showed that women's belief on their urogenital infections into two main themes, infection diagnosis and infection causes. Infection diagnosis falls into 2 sub-themes, namely, traditional diagnosis and medical diagnosis. The reasons behind female genital tract infection fall into three sub-themes, including brides' behavior in the wedding night, women's behavior during menstruation, and behaviors related to sexual health.

Discussion: Given that the health beliefs enjoy high leverage, an effective step can be taken to reform and promote women's insights and beliefs through establishing a link between traditional methods and the well-known modern medicine.

Keywords: belief, infection, women, urogenital, diagnosis, qualitative study

Introduction

Women mostly visit gynecological disease specialists due to genital tract infections. Patient's proper understanding and the specialists' right approach contribute to the treatment of these diseases and reduction of their long-term effects (1).

Also, these infections are the most prevalent infectious diseases during pregnancy harming both the mother and the fetus, thus they should be diagnosed and treated at once. Education, screening, treatment, and prevention comprise the significant components of prenatal care (2).

The relationship of some types of genital tract infections with preterm delivery, low birth weight and postpartum infection is direct and significant (3) which incurs high costs to families and society and leads to disability in infants (4).

Epidemic sexually transmitted genital tract infections are reported in the United States. Based on the CDC estimation, almost 20 million new infections per year incur about $ 6 million. Since 2010, these infections are increased by approximately 4-8%.

In Iran 10-15% of women experienced this infection during their lives, of which 1-2% of sexually active young women suffer with its complications i.e. acute pelvic infections, the most prevalent of which is in women aged 16-25 (5).
The disability of which is more than all other infections occurring in this age group, and its etiology is different in specific geographical regions and some populations.

Almost 85% of infections are spontaneous and non-iatrogenic which occur in pregnant women with sexual activity. The other 0.15% includes infections that occur after doing activities damaging cervical mucus barrier such as insertion of IUD, biopsy or curettage, and uterine endometrium.

Other risk factors include early sexual activity, increased sexual activity, smoking, women whose husbands have multiple partners, low social-economic level, a recent history of abortion, and avoiding contraceptive methods.

The complications include infertility, ectopic pregnancy, chronic pelvic pains, and even seldom mortality from tube-ovarian infections if diagnosed and treated inappropriately (5).

Moreover, the pelvic infection – despite symptoms of acute onset – can cause continuous or intermittent chronic infections that ultimately lead to complications such as infertility. By and large, the rate of pelvic infection in infertile women is more than fertile women (6).

Therefore, given the significance of the subject and involvement of pregnant and non-pregnant women age group, we should seek for a proper and standard method to reform health behaviors among women. Understanding and finding this model requires recognizing the culture and beliefs of a community, and a common and uniform model is not achieved unless the geography and climate are separated.

Community health culture depends on multiple factors such as social beliefs regarding the disease, education, health, sexual behaviors, health services, level of education and the economy of that society. No doubt the infections of the genital tract and consequently their complications are reduced in women by raising their beliefs in this regard and drawing them to the facts based on the scientific evidence (7).

To promote an educational treatment plan as well as proper development of a model for women during fertility age, we need to identify their imaginations, concepts, and beliefs about the disease and their treatment decisions, and definitions. Basically, these beliefs should be investigated individually for each region and culture.

Methods

This article is part of a qualitative study that explores woman’s beliefs about female genital tract infections during pregnancy in the city of Neyshabur. In the study 144 married woman with different ages participated in the central part of the city of Neyshabur, Zeberkan, Sarvelayat and Mian Jolgeh.

The samples were chosen based on Purposeful Sampling and the maximum variation sampling of various ethnic groups (Fars, Lor, Turks and Arabs) and education levels.

How to choose the centers were as follows: Comprehensive health service center number one in the city center as well as Farakh and Mirabad Health Centers were selected as representative of urban and rural population.

In Sarvelayat district, there are Barzanoun and Marusk health centers, which share the same customs and traditions, but they are different from other centers. Therefore, Barzanoun Health Center and Barzanoun Medial House were chosen. From the rest of health centers, Chekneh Health Center and Fahneh Medical House were included in the study. In Mian Jolgeh district, out of Raeesi, Ardameh and Fadisheh centers, Raeesi Medical House and out of another house center, Golbou Health Center and Golbou Sofla Medical House were selected. The underlying reason for selection of these centers was that health customs and beliefs of their respective population were representative of the entire region.

In Zeberkan District, Ghadamgah Health Center and Poust Foroushan Medical House were chosen, as this district corresponded to other areas in terms of customs and traditions, and it was geographically located in the middle area with its people largely belonging to the middle-income category.

In the central region, 35 female participants were recruited from Heath Center 1 (n=19), Mirabad (n=11) and Farkhak (n=5). In Zeberghan District, 25 subjects from Poust Foroushan village and in Sarvelayat District, 40 participants - 20 from Fahneh and 20 from Barzanoun - discussed infertility issue. In Mian Jolgehe District, 44 subject including 30 from Raeesi village and 14 from Golbou village participated in the study.
In the beginning of the project meetings were held with the presence assistants and cooperator about proposal and research methods in Health Center in four districts of Neyshabur. Then several workshops focused on qualitative research methods and focus group discussion for health volunteers and relevant officials to transfer in formation to other health volunteers. Of participants was obtained oral and written informed consent and to them was assured about having permission to investigate, maintaining anonymity, confidentiality and resignation from the study.

In this study, the predominant method for data collection was focus group discussion, but the three groups of people were conducted individual interviews; the first group, those who have wealth of information about our research topic, such as local midwives, the second group of elderly women who were not patient enough to attend in group sessions and finally volunteers group. Time and place of the interview was chosen by participants, mostly in the home of one of the women participants, mosques, Shrine and home health. Sampling continued until data saturation.

For this purpose, Interviews were conducted by using unstructured questionnaire. In first interview used of general question about participant’s beliefs about female genital tract infection before pregnancy and then more in-depth questions were followed. Other questions depend on the interview process and answer any person. Which that by listening and reviewing previous interview, the questions in the mind of the interviewer took shape for the next interview. We were used for more information, clarity and encouraged participants to continue the interview and get to the deeper issues during the interview questions such as “What did you mean?” “Can you explain?” The duration of each interview session lasted average between 45 to 60 minutes. In this study was held 58 volunteers with 65 meeting. Speeches were recorder by the voice recorder or mobile phone and written on paper the first opportunity. After typing the content, reinter views were listened and matched with typed text that to be modified content for incomplete or incomprehensible.

Data analysis was performed using AtlasT software. Data were opened code, Those who have had similar, were placed in a class. In this way after typing interview in Word software and convert doc extension to rtf, files were open code in AtlasT software. After extraction and determination of initial codes, those were similar that have been placed in a class and each group using the View content words, And family and superfamily were made and finally the appropriate network was designed.

To assess and increase the reliability and validity qualitative Trustworthiness of findings in qualitative research, were used methods. The proposed method was used Lincoln and Guba. To provide (Credibility) data was used Prolong engagement method (8). Thus, to confirm the accuracy of the data and extract key concepts, the review participants were used. The text of the interview and its code, besides member check by 4 of external check in the field of qualitative research was reviewed and approved.

**Result**

The findings of the present study showed that women's belief regarding the lower genital tract infection falls into two main themes, infection diagnosis and infection causes. Infection diagnosis falls into 2 sub-themes, namely, traditional diagnosis and medical diagnosis. The reasons behind female genital tract infection fall into three sub-themes, including brides' behavior in the wedding night, women's behavior during menstruation, and behaviors related to sexual health.

**Infection diagnosis:** The specialist can reach a diagnosis based on the symptoms or by sampling genital secretions and testing them. Participants’ beliefs on the diagnosis fall into two sub-themes, including traditional diagnosis and medical diagnosis.

**Traditional detection:** People used to fall back on traditional methods for the diagnosis of diseases due to the lack of advancements in medical science and a shortage of doctors. Todays, according to some participants of the present study, genital infections are diagnosed by traditional methods and without visiting the specialists, such that women an illiterate 65-year-old with 8 child said: “the yolk of a boiled egg was inserted into the genital tract, and change of color into blue was interpreted as infection. In this regard, participants with diploma educational, 33 years old and has 2 children states: Having back pain, abdominal pain, and knee pain were interpreted as infection.

**Medical diagnostic:** A number of participants referred to the new methods of diagnosis, including consulting with the doctor and taking tests. For example women with 46-year-old, 4 children and primary education says: Infection and cysts prevent pregnancy and patients should see a doctor first, or Mrs. 28-year-old with diploma education and 2 children says: then proceed with testing and disinfecting.

**Causes of female genital tract infection:** Vaginal infections are the most common diseases in childbearing age and pregnant women. Different types of bacteria and other organisms like fungus normally live in the vagina, but some of these organisms abnormally grow in favorable conditions, leading to vaginal infections, the symptoms of which include abnormal vaginal discharge.
Beliefs about brides' behavior at the wedding night: The bride and groom engage in their first intercourse in the wedding night. The wedding night involves special customs among the traditional Iranian families in the past and present, for instance, most of the participants believed that it is better not to bathe after the first sexual intercourse, because it leads to genital tract infection and pave the way for infertility. In this regard women 56-year-old with primary education and 6 children states: The bride shouldn't bathe for 3 days, because the uterus absorbs water which can cause infection. The other two participants stated that the bride should neither sit nor use a tub if she needs to bathe.

Some believed that wearing underwear also paves the way for genital tract infection due to providing favorable conditions for the growth of pathogens resulted by lack of air flow and constant contact with vaginal discharge. According to the participants this issue is more crucial, especially in times of increased vaginal discharge. In this regard participants an illiterate 83-year-old with 9 children said: Women refused to wear underwear at wedding night to avoid infection.

Beliefs about women's behavior during menstruation: Menstruation is the most significant period in the life of every woman, in particular, because women are engaged with it for one week. This period is along with specific health rules and musts due to its relative importance and that ignoring these rules can lead to genital tract infections. One of participation 54 year-old with 5 children says: During menstruation, it is better not to wash after urination, because the water goes inside leading to infection. Women with 45 aged and primary education and 3 children states: The reason behind infection and late pregnancy is using cotton cloth rather than sanitary pads.

Beliefs about sexual health: Infectious diseases are those transmitting from person to person. Sexually transmitted diseases are also transmitted during sexual activity. According to the participants in this study, personal hygiene is one of the solutions to prevent or reduce the risk of infection during sexual intercourse. A participant 24 year-old with diploma education and 10 children said that personal hygiene should be fully observed by the partners to prevent infection, otherwise infection is unavoidable. Women 37 year-old with 2 children and diploma education says: The couples must observe personal hygiene to avoid urinary tract infections.

Discussion

In our study, women chosen from different cultures and climates considered the two methods of traditional diagnosis and modern medical diagnosis to diagnose genital tract infections. In the present study, the basis for traditional diagnosis method is the use of edible substance or plants, and these substances change color and respond to vaginal secretions of the infected person. In normal conditions, vaginal flora largely holds aerobic bacteria formed on average from 6 different bacterial species the most common of which are hydrogen peroxide producing lactobacilli. The normal vagina PH is less than 4.5 which is balanced by secretion of lactic acid (9). In the abnormal conditions and if infected, the combination of obligate and facultative anaerobic bacteria, mycoplasma and other types of microbes the vaginal flora substitute which is dominant lactobacilli in normal conditions leads to foul-smelling discharges (10).

The diagnosis of women's genital infections such as vaginitis include the smell of fish, gray color, PH > 4.5, increased CLUE cells, Whiff test (release of a fishy odor on adding KOH), and PCR culture and cytology. Other common and available methods include PH tape and amines, RNA, ribosomal, gardenella vaginalis, and painting, for instance in gonococcus cervicitis infections, increase in neutrophils in the mucopas discharges are painted in slides and / or increase in the number of polymorphonuclear leukocytes is seen in some other infections (9). The opportunistic microbes developing infections and symptoms change the PH of the vagina and as noted before, it is due to the replacement of other microbes than the lactobacilli bacteria (11).

In order to diagnose vaginal infections, women in our study used traditional methods based on food and plant. They learned these methods through the educations of mother, grandmother or older women in the society. It seems that the older women play a greater role in educating women with lower socioeconomic class.

The food and plants in contact with infectious vaginal secretions react by change in odor or color. This change of PH and response to the above substances is the basis of the traditional medicine diagnosis (11). The basis of the common and prompt diagnosis in modern medicine methods is the same way. But according to the studies conducted, using laboratory methods is the most accurate method of vulvovaginal diagnosis and the diagnosis is confirmed only through the positive in vitro-culture (12). Therefore, given the development of new diagnostic methods the use of foods and plants are not recommended for the diagnosis (11).
Another reason for not using plant and food methods i.e. traditional diagnosis methods is the inability to differentiate the type of infection and development of allergy in the patient (13). Another classification for diagnosing genital infections in our study is based on symptoms such as back pain, which is acceptable based on scientific sources, but lacks the sensitivity and specificity required to prove or disprove any infection (14).

In the present study, the second theme in women's beliefs was the analysis of the cause of infection. First, the sexual intercourse at the wedding night was analyzed, when the first culprit in developing infections at the wedding night was considered non-observance of principles and rules such as early shower, ignoring the sanitation during intercourse and even wearing underwear. Definitely sanitation in these areas will be the basis for the prevention of infections in future, and women with a low socioeconomic level defined the observance of these principles in terms of different behaviors with sometimes scientific basis, e.g. wearing inappropriate underwear providing a moist environment for the fungal growth and opportunistic infections (9).

Even bathing was considered as the culprit agent. Because they believe that the old baths with a cellar structure made the water stagnant and polluted due to the public use which resulted in the spread of infection. The vagina environment undergoes an acidity change and infection in those bathrooms and the infection quickly penetrate through contaminated water infecting the women's genital tract. Then these beliefs can be realized through scientific society based on the documents and resources (15).

Women's menstrual cycle is another time period during a woman's life with high risk genital infections. According to the women in the present study, the menstrual cycle and subsequently using sanitary pads or contaminated cloth (by low socioeconomic status in the past) is the aggravating factor of genital tract infection. These beliefs have a scientific basis based on the studies conducted in this regard (10). The absorbent powder in these sanitary pads is a source of moisture leading to infection. Apart from the hormonal changes before the menstrual cycle, these pads provide the favorable environment for opportunistic infections in women's genital tract (10).

In the current study, women believed that the sexual behavior intensifies the infection which leads to the chronic infection. Based on other studies and even the accepted scientific sources, mostly young women who are sexually active comprise the riskiest group of women for infection and STD and that no significant change occurred even under the hygiene principles (16).

Another deep belief of women in this study was the relationship between infection and infertility or transmission of infection to the fetus during pregnancy; in our study, only 2 cases noted such relationship. Based on the scientific evidence and studies conducted in the developed countries, this belief is absolutely true and scientific. One of the causes of infertility among infections is inflammatory causes such as chlamydia, Schistosomiasis, gonococcus and tuberculosis, in which the production of cytokines harms the ovulation and changes the anatomical structure of the female genital tract followed by infection (10). Some mothers believed that the transmission of infection from pregnant mother to the fetus takes place through the umbilical cord, maternal-fetal blood relation, delivery tubes and even breastfeeding. This is now a proven scientific issue (17).

**Conclusion**

We made every effort in this study to understand the traditional beliefs of women regarding their different culture and climate in the field of common infections in women where there can be made a bridge between their traditional conventional methods and the accepted medical treatment. The researchers and the colleagues in the present study made effort to reform or eliminate these beliefs by providing recommendations to health authorities. We hope that this study take a major step forward to improve the beliefs and promote women's insight who are central to the well-being of the family and society.

**Acknowledgement**

This study is sponsored by the Neyshabur University of Medical Sciences. Researchers their duty to express gratitude to health volunteers and of women participating in this study. Also appreciated of the health departments of colleges and health centers and home health for all people who helped us.

**References**

Relationship between Personality Traits with Place Attachment and Resilience of Migrants with Migraine Headaches: a Relational Design

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Abstract

Background: migration process, regardless of the reason and duration, is a stressful event. This stress can be accompanied by increase in ratio of physical and psychological illness. Headache is one of the most common complaints of human being which may happen due to various reasons and migraine and tension headaches are the most common types.

Aim: present study aims to examine the relationship between personality traits with place attachment and resilience of migrants with migraine headaches.

Methodology: this is a cross-sectional study conducted in 2016 with a sample of 140 participants from among the migrants (Afghan migrants and migrants from other provinces of Iran) referring to the Neurological Clinics of the state hospitals affiliated with Shahid Beheshti University of Tehran who had symptoms and complaints about tension and migraine headaches. Sampling based on availability was used to select the participants. Regarding the nature of the study, data were collected based on a survey method and the NEO Personality Inventory, Place Attachment Inventory (PAI) and Personal Resilience Questionnaire. Data were analyzed based on descriptive statistics of mean, standard deviation and variance and also Pearson Correlation Test was used for data analysis.

Findings: results of the study showed that there was a significant negative relationship between neuroticism and resilience (p <0.01) and there was also a positive relationship between extroversion and conscientiousness (p<0.01). However, there was no significant relationship between resilience with agreeableness and openness to experience. Regression analysis also showed that only neuroticism predicts the resilience of this group. Furthermore, there is a positive relationship between extroversion and place attachment (p <0.01).

Conclusion: there is a significant relationship between personality traits with place attachment, resilience of the migrants and their migraine.

Keywords: resilience, place attachment, migraine headaches, migrants, personality traits

Introduction

Quick population growth, economic issues, political instability, ethnic and racial conflicts, wars and unemployment in the developing world have led to a massive increase in the number of migrants and refugees in recent years (World Health Organization, 2013). Migration is a stressful process regardless of any reason and duration of time (Bayer, 2008). This stress can be accompanied by increased rate of physical and psychological disorder. Preparation of migrants and refugees, their acceptance by the host community and the migration process itself are the important factors creating psychological disorder followed by physical illness (Bhugra & Jones, 2009). Place attachment or attachment to a place is a multi-dimensional, complicated and interdisciplinary concept which combines various aspect of individuals’ attachment to place. This concept has been considered by many scholars in various academic areas (sociology, social psychology, anthropology, human geography and architecture) during the last decades.
Theoretical complexity of place attachment, on one hand are related to the concept of attachment which has cognitive, affective and behavioral aspects (Brown and Perkins, 2001). Among social factors, the effect of social ties and relations on attachment to residential place is highly important. In most studies, social ties are the strong and positive predictors for psychological and physiological health of individuals (Miller, 2013). Migraine headaches are among the illnesses which are directly related to stress and stressful situations (Wolfson et al, 2011). Migraine headache is a recurring pounding headaches with transient neurological symptoms. The headache attacks are usually accompanied by vomiting and avoiding light and noise. It usually appears at forehead or temporal region (Muston, 2010). Migraine headache attacks may start with the tensional changes of life such as puberty, change of spatial and social status, etc., and can be created by certain types of incidents, people and experiences. Psychosocial stress associated with affective disturbances and inability to deal with life events is one of the predictors of headache attacks (severity and number of attacks) that can affect the health of the individual (Leyden, 2005). In general, the pressures of life on the individual, how to deal with one's pressure, and the amount of resistance and bearing pressure highly affect the development and exacerbation of migraine attacks. Therefore, headaches, especially migraine headaches, are not only a person's own neurological and psychological problems, they sometimes lead to general disabilities, which in turn affects the quality of life of the patient and family members. Various studies have shown that there is a significant relationship between migraine headaches, quality of life, and coping strategies with life events (Trig, 2009). Resilience, as a popular area in recent years, explores and discovers the individual and interpersonal abilities and makes progress and resistance in difficult situations (Hoods, 2010). Resilience is the individual's ability to establish a biological, psychological and spiritual balance against the risky conditions, a kind of self-repair, which is associated with positive emotional, affective and cognitive outcomes (Kalafi, Ostevar and Haghshenas, 2010). In fact, resilience is said to be a successful adaptation that becomes apparent at the heart of the suffering and stress. This definition of resilience reflects the actions and dynamics that require a complex balance between risk factors and protective factors (Boulahari and Dadfar, 2011). More recently, research into personality and its relation to health and psychological harm has made many researchers interested. There is also a lot of empirical evidence indicating that personality traits play an important role in creating, reducing or eliminating symptoms of physical and mental disorders (Widiger, 2005). It is assumed that personality can affect mental health in two ways; first, indirectly, through the impact on the objective health of individuals, for example, through the effect of personality traits on the type of physiological responses of individuals to stress; second, personality traits have a significant impact on assessments of individuals on their own health (Chalbiano and Garoosi Farshi, 2010). Accordingly, results of various studies have shown a significant relationship between various personality aspects with psychological health indices (Moore et al, 2006; Terracciano, Costa and Jerram, 2010). Generally speaking, life pressure, the way an individual cope with the pressure and their resistance and resilience have significant effect on emergence and intensity of migraine attacks. A study showed a significant relationship between migraine headaches and coping strategies against life events (Davis, 2011). Studies have shown that individuals with high resilience have higher general health and can thus reduce the number and intensity of migraine headaches (Roquette, Fernanda and Oliviera, 2012). According to what mentioned above, the present study aims to examine the relationship between personality traits with place attachment and resilience of migrants with migraine headaches.

Participants

As the present study is a correlational one in terms of method and in correlational research, the size of the sample should be between 5 and 20 participants for each variable (Hooman, 2010), therefore, considering the inclusion of twenty participants for each of the three research variable, 140 participants were included in this study.

\[ N = 5q = 7 \times 20 = 140 \]

Ethical Considerations

Ethical Considerations
Informed consent to participate in this research was made without any compulsion, threat, pundit, or seduction, and the refusal to acceptance or continue to participate in the study was respected. Attempts were made to not investigate the research methods with the religious and cultural standards of the subjects, and the participants of the research should be protected in all stages of the design, implementation and reporting of research on the subject of human dignity, respect, and physical integrity.

Methodology

This is a descriptive correlational study. Population of the study included all the migrants (Afghan migrants and migrants from other provinces of Iran) referring to the Neurological Clinics of the state hospitals affiliated with Shahid Beheshti University of Tehran who had symptoms and complaints about tension and migraine headaches. The data of this study were collected using questionnaire and clinical interviews in 2016 based on a survey method. For this purpose, seventy (N=140) immigrants with migraine headaches were selected through available sampling. Three research instruments of Place Attachment Inventory (PAI), NEO Personality Inventory and Personal Resilience Questionnaire to measure place attachment, personality traits and resilience, respectively. Collected data were analyzed using Pearson Correlation Coefficient to measure the correlation among research variables. First, the research instruments were given to the participants to take permission and informing them about general purposes of the study. Then, they were asked to study the questionnaire completely. They were then thanked for filling the questionnaires and participating in the study.

Research Instruments

NEO Personality Inventory (NEO-PI): Costa and McCrae (1983) developed a test to measure personality and called it Neo. It is one of the most important psychological instruments which is used in studies aiming to examine personality traits. This inventory has 12 items for each domain which are selected based on having higher factor load on the related trait (Costa and McCrae, 2004). In other words, the scale has 60 items to measure big five personality traits of openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. This scale was translated into Persian by Garousi Farshi (2001) and standardized on Iranian students. McCrae and Costa reported Cronbach’s alpha of 0.68 to 0.86 for 5 personality traits and test-retest reliability of 0.86 to 0.90 with a two-week interval. Holden (1992, cited in Chalbianlo and Garousi, 2009) also reported the Cronbach’s alpha of 0.76 to 0.87 for these five personality traits.

Place Attachment Inventory (PAI)

This scale was developed by Safarinia (2001) based on theory of Low and Altman (1992) and experimental studies of Jorgensen and Stedman (2001) and Kyle, Mowen, and Tarrant (2004) who had an attitudinal view of place attachment. The scale consists of 22 questions that assess the three areas of cognition (location identity), emotional (emotional attachment) and behavioral (location dependence and social bonding). The reliability of the questionnaire was obtained using Cronbach’s alpha of 0.92 and using a re-test of 0.91 which indicates the satisfactory reliability of this questionnaire. The questionnaire also has good formalism and structure.

Personal Resilience Questionnaire

Personal Resilience Questionnaire developed by Connor and Davidson is used in this study. This scale has 25 items which are scored based on a four-point Likert scale. The mean score the scale is 52 and scores higher than 52 indicate more resilience and as it approximate zero, it indicates lower resilience. Cronbach’s alpha coefficient was used to determine the reliability of the scale and a coefficient of 0.89 was reported (Samani, Jokar and Sahragard, 2007).

Statistical Analysis

Pearson Correlation as a parametric test was used in this study due to the nature of the study, review of related literature and aiming to examine the relationship between personality traits with place attachment and resilience regarding the fact that all three scales are based on interval.

Findings
The indices of central tendency and dispersion of big five personality traits, resilience and place attachment component scores of the experiment group are presented in Table 1.

Table 1: The indices of central tendency and dispersion of research variables

<table>
<thead>
<tr>
<th>main personality traits</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism N</td>
<td>22/16</td>
<td>7/86</td>
</tr>
<tr>
<td>Extroversion E</td>
<td>30/70</td>
<td>5/04</td>
</tr>
<tr>
<td>Openness O</td>
<td>25/65</td>
<td>4/47</td>
</tr>
<tr>
<td>agreeableness A</td>
<td>29/79</td>
<td>5/50</td>
</tr>
<tr>
<td>Knowledge C</td>
<td>32/93</td>
<td>5/57</td>
</tr>
<tr>
<td>Cognitive (place attachment)</td>
<td>33/05</td>
<td>12/055</td>
</tr>
<tr>
<td>Affective</td>
<td>49/21</td>
<td>8/333</td>
</tr>
<tr>
<td>Behavioral (social and place attachment)</td>
<td>23/32</td>
<td>6/728</td>
</tr>
<tr>
<td>Resilience</td>
<td>64/80</td>
<td>16/09</td>
</tr>
</tbody>
</table>

Table 2: Pearson Correlation Coefficient of resilience, place attachment and five big personality traits

<table>
<thead>
<tr>
<th>main personality traits</th>
<th>X</th>
<th>Y</th>
<th>r_{XY} (n=140)</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>F</td>
<td>Resilience</td>
<td>298/102 **</td>
<td>-0/651</td>
</tr>
<tr>
<td>Extroversion</td>
<td></td>
<td></td>
<td>100/347 **</td>
<td>0/527</td>
</tr>
<tr>
<td>Openness</td>
<td></td>
<td></td>
<td>192/942**</td>
<td>0/594</td>
</tr>
<tr>
<td>agreeableness</td>
<td></td>
<td></td>
<td>129/915 **</td>
<td>0/540</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td>420/050 **</td>
<td>0/769</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>place attachment</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>F</td>
<td>place attachment</td>
<td>415/023**</td>
<td>0/787</td>
</tr>
<tr>
<td>Extroversion</td>
<td></td>
<td></td>
<td>591/180**</td>
<td>0/840</td>
</tr>
<tr>
<td>Openness</td>
<td></td>
<td></td>
<td>453/107**</td>
<td>0/781</td>
</tr>
<tr>
<td>agreeableness</td>
<td></td>
<td></td>
<td>252/220**</td>
<td>0/686</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td>560/078**</td>
<td>0/819</td>
</tr>
</tbody>
</table>

* \( P < 0.001 \)

Given that the absolute value of the calculated t index (for all big five personality traits) is greater than the critical \( t_{0.01} \) index with a degree of freedom of 198 in the two-domain tests (2.576), so the null hypothesis indicating lack of correlation between the five main factors of personality and resilience is rejected with 99% confidence level.
Increased neuroticism leads to reduced rate of resilience in patients with migraine. With increasing extraversion, openness, agreeableness, conscientiousness, and resilience increases in patients with migraine.

Given that the absolute value of the calculated $t$ index (for all big five personality traits) is greater than the critical $t_{0.01}$ index with a degree of freedom of 198 in the two-domain tests (2.576), so the null hypothesis indicating lack of correlation between the five main factors of personality and place attachment is rejected with 99% confidence level.

Conclusion

Patients with migraine have specific personality traits which may be effective in onset or intensity of migraine headache. Patients with migraine headache are mostly worried, anxious and obsessive and these anxiety and worry leads to introverting the emotions and onset of a headache which can be changed to migraine by becoming chronic and not paying attention to changes in personality traits. The present study aimed to determine the relationship between personality traits (neuroticism, extraversion, openness to experience, agreeableness and consciousness) with place attachment and resilience of migrants with migraine headache. Results of the study showed that there was a negative and significant relationship between resilience and neuroticism which included negative emotions and lack of or weakness in compatibility (Besharat, 2010). This is in line with findings of Campbell-sills, Cohen and Stein (2006) and Climer, Cowen and Wyman (2000). Climer, Cowen and Wyman (2000) reported that neuroticism includes negative affections such as feeling sad, anger and discomfort and the patients which are low in terms of negative affection would probably show more incompatibility facing hard and disastrous situations. Furthermore, Campbell-sills, Cohen and Stein (2006) pointed that vulnerability to tension is one of the personality traits in neurotic patients. Thus, it is not wonderful if the patients with higher scores on neuroticism obtain lower score in resilience scale. Moreover, there is a significant positive relationship between resilience and extroversion which includes positive emotion and affections style, close interpersonal relationship and high level of social activity and interaction (Tugade and Fredrickson, 2004). These findings are in line with the studies of Besharat (2007) and Linguae (2022). Tugade and Fredrickson (2004) indicated that given that migraine headache (as mentioned) is a multifactorial illness, undoubtedly many hereditary, psychological and social factors play a role in its emergence and exacerbation, and perhaps one of the shortcomings of this study is the mere examination of psychological factors of cognitive resilience, defense mechanisms and general mental health. One of the social factors that can be mentioned is migration. Separation from family and community, non-acceptance in the host country, severe harm before leaving the homeland, aging or adolescence, lack of familiarity with the language of the country, and lack of social-economic factors are considered as influential factors on the mental health of migrants and retarded people. There are significant relationships between psychological problems such as anxiety, and depression with migraines headaches of the migrants. Among the limitations of this study, it can be reminded that this study is of a correlation type, so it can only be said that there is a relationship between resilience and the big five personality traits, not that one factor causes the other and this is the most important limitation of every correlation research. Controls to eliminate the effects of individual differences (e.g., introversion / extraversion) or other probabilistic variables in studies such as the present research are not straightforward, and they only rely on the sampling and sampling methods with the natural society.

Conclusion

Therefore, it is suggested that two construct of place attachment and resilience should be studied in the form of experimental research designs and controlled by interventional variables. Another limitation of the study is the reliance of the findings of the present study on data collected from personal reports. It is necessary to pay attention to the limits imposed by caution in generalizing and concluding findings from the reported findings. Given that migraine and tension headache are multifactorial illnesses, there are no doubt many hereditary, psychological and social factors involved in its development and intensification. Therefore, based on the results of this study, it can be concluded that in psychiatric aspects associated with headache should be considered diagnosis, prognosis and treatment of chronic headaches.

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Parenting style, positive youth development and academic buoyancy: a causal model

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Abstract

Academic buoyancy is defined as maintaining academic competence and positive adjustment against encountered adversities in adolescents in the academic context. The aim of the present study was to determine the relationship between perception of maternal and paternal parenting and positive youth development with academic buoyancy using structural equation model. 400 adolescent girls completed self-report measures on their perceived parenting, positive youth development and academic buoyancy. Findings indicated that the effect of positive youth development and perception of parenting on academic buoyancy are both positive and significant and also positive youth development plays a mediatory role regarding perception of parenting and academic buoyancy. In addition, 48% of the variance of academic buoyancy and 41% of the variance of positive youth development can be explained by the variables in the research model. Thus, it can be mentioned that contextual (perception of parenting) and individual (positive youth development) variables affect academic buoyancy.

Keywords: Academic Buoyancy, Resilience, Positive Youth Development, perception of parenting.

Introduction

In recent years, new approaches in psychology called “positive psychology” have become popular, where they focus on a person’s abilities and talents, rather than their deficits and disorders. The ultimate goal of this approach is identifying ways to promote wellbeing and happiness for a person. Therefore, the most fundamental constructs considered in this approach are factors that increase a person’s adaptability to life’s needs and threats. Resilience, along with its dimensions such as AB (academic buoyancy), is of particular interest in the fields of developmental psychology, educational psychology and mental health (Hejazi, SalehNajafi & Gholamali Lavasani, 2015).
Resilience is the maintenance of competence or positive adaptability in encountering life adversities. Resilience helps individuals improve successfully after encountering life challenges and adversities (Lerner et al., 2012). In recent years, the multidimensionality nature of this construct is particularly emphasized that emotional resilience, mental resilience and academic resilience can be mentioned (Luthar, Cicchetti, & Berker, 2001). Resilience in the academic context (academic resilience) refers to students’ successful academic performance in spite of academic challenge and stress (Martin & Marsh, 2006, 2009). Martin and Marsh (2008a) argued that the researches on academic resilience were conducted in groups of students who were exposed to intense life threats and adversities such as poverty, single-parenthood and natural calamities and ignored other students who are not confronted with intense problems and adversities. Daily academic setbacks and challenges such as weak grades, threats to self-confidence and test anxiety are regarded as the steady reality of the academic life of most adolescents. Accordingly, these researchers introduced daily academic resilience as AB in the field of positive psychology.

According to Martin and Marsh (2009), academic adversities and challenges can be intense and harsh such as being expelled from school to having an intense quarrel with a teacher. They can also be less extreme, such as getting low grades every now and then or experiencing stress and mental pressure from studying, exam anxiety. They suggest that AR (Academic Resilience) is personal and it is relevant to basic adversities and difficulties, while AB is concerned with students’ daily academic adversities (Martin, 2013). Thus, it seems that AR is pertinent to a small group of students and AB is concerned with all students who at some point experience the less intense forms of academic challenges. (Martin & Marsh, 2009).

AB is defined as maintaining academic competence and positive adjustment against encountered adversities in adolescents (Martin & Marsh, 2009; Martin, Ginns, Papworth, & Ghasemi-Nejad, 2013; Martin, 2014). Based on Bowen’s results (2010), AR is relevant to depression, emotional estrangement, social isolation, refractoriness and school expelling and AB is concerned with the usual challenges in students’ self-confidence, motivation and engagement in the academic life. In accordance with Martin and Marsh (2008a, 2009) and Martin (2013), that AB is applicable to all students in relation to the traditional concept of resilience, the present study investigates the antecedents of AB in the area of positive psychology.

Predictors of AR and AB (Daily academic resilience) can be divided into distal and proximal ones. In this regard, Martin and Marsh (2008a) pointed out that proximal factors include life experience at the present time or available resources such as psychological, educational, family and peer factors. Distal factors are relevant to
important experiences in the individual’s life history affecting current events. Research results have indicated that proximal factors can be more manipulative in educational and behavioral interventions and have more ability to make positive changes. Therefore, in the present study, perception of parenting is regarded as the proximal factor and PYD (Positive Youth Development) as the effective individual factor in AB.

In the relational developmental systems theory (Lerner, 2011, Overton, 2013), resilience is an aspect of positive human development that accomplish through adaptive mutual relationship between an individual and his or her ecological systems (Lerner, et al, 2012). Making adolescents equipped with positive developmental abilities and functions increases their ability in encountering problems, challenges and stresses in all life fields (Lerner et al., 2012; Lerner, 2013). One of the suggested concepts in relational developmental systems theory is the concept of PYD. In this model, equipping adolescents with positive developmental functions results in psychological functions such as buoyancy.

PYD is conceptualized in different forms (Lerner et al., 2011). One of these models is suggested by Lerner (2004) in the form of “five Cs”. In the model, the conceptualization of PYD is formed with emphasizing adolescents’ abilities. These abilities are used in five components to describe the characteristics of a thriving adolescent, including competence, confidence, connection, caring and character. These characteristics enable adolescents to take step in the adult world desirably. The PYD approach emphasizes adolescents’ strengths and abilities and believes that considering these abilities and reinforcing them can place them in the path of positive development. Finally, the thriving adolescent not only will be safe from endogenous and exogenous problems such as depression and high risk behaviors, but also will achieve another characteristic of contribution in the family and civil society (Farruggia & Bullen, 2010). A number of researchers believe that promoting positive development in adolescents can enhance AR in at-risk adolescents and children (Edwards, Mumford, & Serraroldan, 2007; Evans, Banerjee; Aldana; Foust; & Rowley 2012; Smith & Barker, 2009; Lerner; Von eye; Lerner & Lewin- Bizan, 2009).

According to relational developmental systems theory (Lerner, 2006, Overton, 2013), in mutually person ←→ context relations, when the strengths of individual are aligned with resources in the environment and ecological context (e.g., families, schools and neighborhood), the probability of positive development and positive developmental outcomes such as resilience, increases. Multiple factors in individual (e.g., cognitive and motivational abilities) and different factors within multilevel ecological systems such as families contribute in positive development (Lerner, 2006b). In other words, family, as the most fundamental contextual factor, plays
a crucial role in students’ positive development and preparation to confront life challenges such as academic setbacks

On the other hand, in explaining the role of parents in the positive youth development, Self Determination theory pertains well to socialization and children’s development (Grolnick, 2009). Parents, as the factor of socializing children, play an important role in satisfying their psychological needs and their positive development. Ryan and Deci (2000a) in the theory of “self-determination” regard man as an active agent with basic psychological needs, that has intrinsic motivation to meet his needs and also inherent tendency to be dominant over his surrounding environment so that his wellbeing depends on meeting three innate, basic and universal needs including autonomy (selecting deeds freely), competence (mastery over deeds) and relatedness (making relation with important individuals in life and enjoying their support). The context and environment that contribute to psychological needs being satisfied by their support, provides the background to achieve high psychological wellbeing in individuals (Grolnick, 1997).

In the theory of self-determination, parents’ effect is investigated in the three frameworks of involvement (a degree in which parents identify their children’s favorite activities and participate in them actively), autonomy support (a degree in which parents support children problem-solving attempts, allowing children choices select and participate them in decision-making) and warmth (expressing love, kindness, interest and satisfaction to children (Tanhaye Reshvanloo & Hejazi, 2012., Grolnic, 2009).

Chand et al. (2013) reviewed the research literature referred to the features of parenting that are important for the developmental outcomes of adolescents. These factors include: low levels of adolescent-parents conflict (McElhaney et al., 2009), parents’ warmth (Nash et al., 2005), effective parental monitoring (Kerr & Statin, 2000) and supporting of autonomy and decision-making in adolescents (Silk et al., 2003). To determine the predictors of positive youth development, saleh najafi (2013). Found that all aspects of perception of parenting (warmth, Autonomy support and parental involvement) had positive significant relationship to PYD. Furthermore, Dehghanizadeh and HosseinChari (2012), in their research, analyzed the mediatory role of self-efficacy in the relation between perception of the family communication model and AB. Their research results showed that self-efficacy has a mediatory role between conversation tendency and AB.

Respecting the presented issues, the main objective of the present study is to identify the role of PYD between perception of parenting style (maternal & paternal style separately) and AB in the structural model.
The current study examines the role of two contextual and individual variables (perception of parenting style as contextual and PYD as individual variable) in AB based on relational developmental systems theory (Lerner, 2011; Overton, 2013) as well as Bio-ecological approach to human development (Bronfenbrenner, 1979). According to the conceptual model, the research hypotheses are as follows:

1. Students’ perception of parents’ parenting styles has a direct effect on their positive development.
2. Students’ positive development has a direct effect on their AB.
3. Students’ perception of parents’ parenting styles has an indirect effect on their AB through positive youth development.

METHOD

Procedure

The methodology of the present research and its plan is descriptive (non-empirical) and correlative of structural equations, respectively, because in the research, the relation between variables is analyzed in the form of a causal model.

Participants

The statistical population of the research includes all female high school students of Kerman studying in the academic year 2014-15. The size of the statistical population was estimated 3810 persons according to the report...
of SENAD system of the Educational Plan Department of Kerman and among them, 400 persons were selected as the research sample. To select the participants in the research, multiphase clustering sampling method was used.

To control the difference made by urban or non-urban effect in the research variable, the sampling was limited to the urban governmental schools.

**Measures**

**Perception of parenting**

Students’ perception of parenting style was measured by the scale of the perception of parents prepared by Robbins (1994) and according to the theory of self-determinism. This scale has two versions of children and college students. In this research, the second version that is designed in accordance with the adolescent years is used. This scale has 42 items (21 items for the mother and 21 items for the father which are 21 items repeated twice, once for the mother and once for the father. Questions are adjusted based on the Liker five-point scale from completely disagree (1) to strongly agree (7). The factorial structure of this scale, according to the makers’ view, includes the components of involvement, autonomy support and warmth for each of parents that totally constitutes six factors. The validity of the subscales of this tool by its makers is reported 0.72 and 0.86 (Robbins, 1994). The coefficients of Cronbach’s alpha in the present research are 0.85, 0.75, 0.87, 0.79, 0.87, 0.85 and 0.93 for the subscales of involvement (mother), autonomy support (mother) warmth (mother), involvement (father), autonomy support (father) warmth (father), and the whole scale, respectively. The results of confirmatory factorial analysis are mentioned in Table 1.

**PYD**

PYD inventory (Arnold et al., 2012) has two short and long forms that is prepared based on 5C model of PYD (Lerner et al., 2005). In the present research, the long form with 48 items and 5 subscales of competence (14 items), confidence (9 items), connection (8 items), character (9 items) and caring (8 items) was used. Questions are adjusted in the continuum form of 4 points from (1) completely disagree to (4) strongly agree. Alpha coefficients in the present research were obtained 0.78, 0.85, 0.87, 0.83, 0.85 and 0.88 for competence, confidence, character, caring, connection and the whole scale, respectively. The results of confirmatory factorial analysis are presented in Table 1.
To measure students’ AB, Husseinchari and Dehghanizadeh’s questionnaire (2012) was employed. The makers developed this scale with modelling Martin and Marsh’s scale of AB (2008) that has 4 items. This scale has one factor and 10 items that is adjusted in Likert seven-point scale from (1) strongly agree to (7) completely disagree. In the present research, the reliability coefficient was calculated using Cronbach’s alpha and 0.83 was obtained. The results of confirmatory factorial analysis are presented in Table 1.

To examine the validity of the research tools, confirmatory factorial analysis was used. In Table 1, the results of confirmatory factorial analysis are reported to analyze the validity of the variables. As observed, the indices of the research tools have an acceptable validity.

### Table 1: Fitness indices of confirmatory factorial analysis models

<table>
<thead>
<tr>
<th>Indices</th>
<th>$\chi^2$/df</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
<th>CFI</th>
<th>NFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father’s parenting style</td>
<td>2.33</td>
<td>0.058</td>
<td>0.95</td>
<td>0.92</td>
<td>0.99</td>
<td>0.98</td>
</tr>
<tr>
<td>Mother’s parenting style</td>
<td>1.92</td>
<td>0.048</td>
<td>0.96</td>
<td>0.94</td>
<td>1</td>
<td>0.99</td>
</tr>
<tr>
<td>PYD</td>
<td>2.69</td>
<td>0.065</td>
<td>0.93</td>
<td>0.90</td>
<td>0.96</td>
<td>0.95</td>
</tr>
<tr>
<td>AB</td>
<td>3</td>
<td>0.071</td>
<td>0.96</td>
<td>0.93</td>
<td>0.94</td>
<td>0.91</td>
</tr>
</tbody>
</table>

### Data Analysis Method

To analyze the causal relations between the variables, structural equations method was used after calculating the descriptive indices of the research variables. To analyze the data, SPSS and LISREL Software were used.

### Results

Considering the correlative matrix as the basis of the analysis of casual models, correlative matrix, mean and standard deviation of the studying variables are presented in Table 1.
The results of Table 1 show that the correlative coefficient of father’s parenting style is positively and significantly related to mother’s parenting style (r=0.52), PYD (r=0.46) and AB (r=0.51) at the p<0.01 level. The correlative coefficient of mother’s parenting style is positively and significantly related to PYD (r=0.47) and AB (r=0.48) at the p<0.01 level. The correlative coefficient of PYD is positively and significantly related to AB (r=0.65) at the p<0.01 level.

In the figure 2 of the tested model, the relation between parents’ parenting styles, PYD and AB is presented. As observed, the path of father’s parenting style to AB is significant at the level 0.05. The rest path coefficients are positive and significant at the 0.01 level. Mother’s parenting styles have the highest effect coefficient on AB.

![Figure 2: Tested model of the research](image)

Chi-Square=375.60, df=145, P-value=0.00000, RMSEA=0.063

Since in the above model, the mediatory role of PYD is analyzed in the relation between parents’ parenting styles and AB, in Table 3, the coefficients of direct, indirect and total effects as well as the explained variance of the research variables are reported.

<table>
<thead>
<tr>
<th></th>
<th>AB</th>
<th>PYD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father’s style</td>
<td>Autonomy</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>Involvement</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>Warmth</td>
<td>0.59</td>
</tr>
<tr>
<td>Mother’s style</td>
<td>Autonomy</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>Involvement</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>Warmth</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Table 3: Results of tested model
As shown in Table 3, the effect of PYD (β= 0.45), mother’s parenting style (β= 0.49) and father’s parenting style (β= 0.16) is positive and significant on AB. The effect of mother’s parenting style (β= 0.51) and father’s parenting style (β= 0.39) is positive and significant on AB. The indirect coefficients of father’s parenting styles (β=0.17) and mother’s parenting styles (β= 0.23) on AB are positive and significant through PYD. Thus, PYD plays a role in the relation between parents’ parenting styles and AB. In addition, results indicated that 48% of the variance of AB and 41% of the variance of PYD are explained by the variables exiting in the research model.

The fitness features of the structural equations model are presented in Table 4.

<table>
<thead>
<tr>
<th>Paths</th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Total effect</th>
<th>Explained variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toward AB from:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PYD</td>
<td>0.45**</td>
<td></td>
<td>0.45**</td>
<td>48%</td>
</tr>
<tr>
<td>Father’s parenting styles</td>
<td>0.16*</td>
<td>0.17**</td>
<td>0.43**</td>
<td></td>
</tr>
<tr>
<td>Mother’s parenting styles</td>
<td>0.49**</td>
<td>0.23**</td>
<td>0.72**</td>
<td></td>
</tr>
<tr>
<td><strong>Toward PYD from:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father’s parenting styles</td>
<td>0.39**</td>
<td>-</td>
<td>0.39**</td>
<td>41%</td>
</tr>
<tr>
<td>Mother’s parenting styles</td>
<td>0.51**</td>
<td>-</td>
<td>0.51**</td>
<td></td>
</tr>
</tbody>
</table>

**P<0.01

According to Table 4, the relation of chi-square to free degree (χ²/df=2.59), goodness of fitness index (GFI=0.95), adjusted goodness of fitness index (AGFI=0.91) and the root mean square error of approximation (RMSEA=0.63) are at a suitable level. Therefore, the fitness of the model predicts AB at a suitable level.

Discussion and Conclusion
The aim of the present research was to investigate the relation between parents’ parenting style and PYD with AB using structural equations. The results of structural equations indicated that the suggested model has good fitness with the research data and can explain 48% of the variance of AB and 41% of the variance of PYD.

The research results are discussed according to the research hypotheses as follows:

According to the first hypothesis of the research, the perception of parenting has a direct effect on adolescents’ PYD. Results indicated that the direct effect of the perception of parents’ parenting styles on adolescents’ PYD was positive and significant. This result is consistent with the results of Bowers et al. (2014), Chand et al (2013), Carvalho and Schumacker (2012), McKey (2007), Hejazi, Saleh Najafi & Gholamali Lavasani, (2015) and Rahmani et al. (2006). According to the result, it can be mentioned that parents, as the first factor of socializing children, by their parenting style, play a crucial role in their children’s psychological and social development and their behavior is effective in satisfying or dissuading psychological needs (Niemiec et al., 2006). The experience of a steady and safe relationship with parents and being fostered in a calm and disciplined space contributes to the mental wellbeing and socialization, because child development is intensively affected by relationships with parents. According to the theory of self-determinism, an environment that provides the background to satisfy basic psychological needs in individuals, contributes to the increase of internal inclination to individuals’ psychological health and compatibility. Grolnick et al. (1997) also believe that individuals need have a sense of belonging to parents, and feel secure in their relationship with them. Therefore, parents who are sensitive to their children’s needs and have a warm relationship with them, as well as being encouraging and satisfying their need to belong, promote high levels of positive development. Parents’ warm relationships, especially in adolescence, will be of particular importance in their positive development. At this age, any ostracism by parents according to adolescent’s potential need to express independency, can intensify subsequent problems. Research results indicate that adolescents with parents who support their autonomy, grant them the right to select and participate in decision-making, are warm and welcoming, show their love and kindness to their children and are involved in their children’s academic affairs report higher levels of positive development.

According to PYD approach, all adolescents have abilities. But the Adolescents positive development is predictable by their biological and ecological resources. Studies have indicated that the more exposure that adolescents have to positive resources and experiences—and where synergy between multiple settings can be established—the more likely it is that they will develop positively. Therefore, physical and institutional resources present in the social environment (for example, family supports) are just as essential for promoting
positive youth development as are individual assets (such as skills, talents, and resiliency) (Zarrett & Lerner, 2008).

On the basis of the second hypothesis of the research, adolescents’ positive development has a direct effect on students’ AB. Results indicated that adolescents’ positive development has a direct, positive and significant effect on AB. This result is consistent with the results of Evans et al. (2012), Huberty (2012), Smith and Barker (2009), Lerner et al. (2009) and Edwards et al. (2007). According to the result, it can be mentioned that the positive development of adolescents is based on ability that is in the sense of being involved in positive social behavior and avoiding risk behaviors. According to Lerner (2013), the resources of action in man’s development are Nature’s dynamic interaction (heredity) and environmental experience and contextual effects (education) and individuals are in the center of the interaction. Accordingly, in the theory of relational developmental systems, individuals are the third resource for individuals’ development. Contrary to theories such as Skinner’s behaviorism (1965) that believe that behavioral development is necessarily controlled by the environment, scientist of developmental sciences regard individuals as the main resource and the center of development and consider them able in encountering life challenges. In this regard, positive-based intervention programs emphasizing children and adolescents’ strengths abilities have the most crucial role in creating resilience and buoyancy in adolescents compared to other preventive models. Therefore, Huberty (2012) believes that resilience and buoyancy is the consequence of positive development and thriving Thus PYD can be regarded in preventive programs such as prevention of depression and anxiety in children and adolescents. Furthermore, according to Roth and Brooks-Gunn (2003), promoting PYD takes children and adolescents toward generative adult and by providing necessary opportunities and support contribute to adolescents to acquire required qualification and knowledge to deal with increasing challenges during their development.

According to the third hypothesis of the research, students’ perception of parents’ parenting styles indirectly affects their AB through adolescents’ positive development. Results indicated that the indirect effect of students’ perception of parents’ parenting styles on their AB is positive and significant through adolescents’ positive development.

On the basis of the approach of Relational developmental systems, PYD and AB are affected not only by individual factors, but also contextual factors such as family (Wright et al., 2013., Sesma et al., 2013; Lerner et al., 2012; Lerner et al., 2013; Moore 2013; Ungar & Liebenberg, 2011; Jokar et al., 2011; Hashemi & jokar, (2015).
Masten (2014 b) in response to this question that “what factors can plays essential role in achieving competence (positive development) and resilience in adolescents” refers to the individual characteristics such as high-level intelligence functions, easy temperament, self-regulative skills and at the family level, authoritative parenting, desirable socioeconomic status and extra-family factors such as effective schools. Masten considers these factors as adaptable systems and points out that these systems play a crucial role not only in Adolescents’ positive norm development, but also in their resilience. Thus, she does not regard resilience as the result of unique and perplexing factors in adolescents, but in his view, resilience is the result of the act of adaptable systems in man’s development trend that Masten calls it “ordinary magic”.

According to the research results, parents who are supportive of their children’s autonomy and allow them to participate in their decision and solve their problems independently, create perception of autonomy support in their children. Parents who accept their children unconditionally and have a warm and firm relationship with them, create positive perception of interaction in their children and increase academic motivation, perception of competence, academic adjustment, academic achievement and positive development in them (Grolnick & Ryan, 1989; Grolnick et al., 1997; Jimerson, 2000; Leung et al., 2004; Mo & Sing, 2008; Karsheki, 2008; Tanhaye Reshvanloo & Hejazi, 2012; Hejazi & Salehnajafi, 2015). The issue, in turn, increases adolescents’ resilience and buoyancy.

Moreover, according to the research results, mother’s parenting styles compared to father’s parenting styles has the higher effect coefficient on PYD and AB. In this regard, Grolnick (2009) believes that parents’ parenting style is affected by three groups of factors. The first group is children’s individual and personal characteristics, because each child is born with their particular psychological characteristics, the characteristics that motivate particular behavior in parents. For example, obstinacy in boys makes most parents involved in controlling their behaviors. The second factor is parents’ life environmental features. Life in stressful environments makes parents not to have the necessary energy, time and mental readiness to be involved in children’s activities. This creates greater limitation and control of children, minimizes the need to autonomy and affects their mental performance. The third factor is parents’ individual characteristics such as expectations of children and their desires that can affect their control level and giving or not giving opportunity of selection to children. Therefore, the obtained differences in this research can be regarded as the result of the individual differences and cultural characteristics of the studying population. Considering the fact that the mother is the first person to be in relationship with the child. She plays the most important role in children’s mental and emotional fostering and is
regarded as the children’s heart of health or disease. Nowadays, in spite of the increase of the trend of joining mothers to the workforce, the relation between mothers and children is more firm than in the past and women have found the ways to maintain the balance between work and child caring. In addition, in traditional cultures such as the studying population, mothers are more involved in fostering their children, spend more time with them and have greater interaction to solve their problems. Kim, & Rohner, (2002) point out that owing to the unemployment of most mothers in traditional societies, they can spend more time with their children and therefore, their involvement in their children’s academic activities and their warmth and acceptance as well as autonomy support are related to greater positive development and academic buoyancy. Although in Iran, the number of dual-income families has increased over the years, but the mother role in parenting, traditionally, defined as caregiver (see, Bem, 1974, sex role theory), thus mothers compared to fathers provide more warmth for children and more involved in academic affairs.

The research results have applied implications. Planning and implementing each program is relevant to the promotion of adolescents’ positive development and AB that requires its identification of effective elements and components. The research results can be taken into account by planners and can make reforms in the educational institution. In the present research, the role of gender in the relation between the variables is not analyzed and according to the fact that individuals’ gender is among the characteristics playing role in their beliefs of their abilities, this variable can be effective in resilience and buoyancy. Thus, it is recommended that gender will be analyzed in future researches. Furthermore, the research data have been collected using self-report tools. This kind of data is biased inadvertently and advertently, therefore, it is suggested that qualitative and mixed research methodologies be employed in future researches.

References


The casual relation between perceived stress and social support by mediating psychological hardiness in life expectancy in Type 2 Diabetic Patients

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³Associate Professor of Imam Hossein University, Tehran, Iran

Abstract

Purpose: the current study investigated the casual relation between perceived stress and social support by mediating psychological hardiness in life expectancy in Type 2 Diabetic Patients. Method: This research was a descriptive-correlational study. The statistical population included all type 2 diabetic patients referring to Shiraz hospitals in Fars province who have been treated in diabetes clinics in 2016-17. According to Muller's formula for modeling the study sample, the number of acceptable samples will be 246 people. They were selected by using available sampling method. In order to analyze the data, in addition to descriptive indexes related to each scale, structural modeling was used to study the main objective of the research. SPSS.22 and Lisrel Software was used to analyze the data. Findings: The model's fit indices were: RMSEA = 0.078, p-value = 0.000, GFI = 0.85, AGFI = 0.85, CFI=0.95, CMIN=2.2, CFI=0.95, NFI=0.98, df= 583, \( x^2 \)= 583, \( x^2/df \)=0.46 Therefore, the model has good fitness. Because all of the model's indices correspond to the standard fit indices. The results of this model are effective in promoting health and compliance in patients with type 2 diabetes and have acceptable fitness. In this study, there was a significant positive relationship between life expectancy, psychological hardiness and social support and patients who had a better life expectancy had better health and quality of life. Hardiness had a direct mediating role on life expectancy through the transfer of the effects of predictive variables of social protection and perceived stress and the life expectancy model of type 2 diabetic patients is predictable based on the social support variable and perceived stress mediated by psychological hardiness and have acceptable fitness. Multiple regression analysis with step-by-step model to predict life expectancy reflects that changes in predictive variables, i.e., social support and psychological hardiness and perceived stress with the level of standardized regression coefficient, have a meaningful coefficient of acceptance by considering the negative load of perceived stress, has been created in negative reversal result of hardiness. The changes of \( R^2 \) at the significant level \( \beta \) (≤ 0.001) is 0.44 and 0.33 respectively.

Keywords: Life expectancy, Psychological Hardiness, Perceived Stress, Social Support, Type 2 diabetes

Introduction

Diabetes mellitus is a chronic disease that requires long-term treatment, care, and modifying lifestyle. Over time, diabetes has been associated with many physical complications and in the long run it can cause various emotional problems such as depression, dysthymia, anxiety disorder, and so on. Since diabetes mellitus has become known as a disease, there has been awareness of the role of emotional factors (Nath, Victor, Naskar, 2016). The chronic disease affects the health of millions around the world and according to the (GBD) report (2015), the prevalence of diabetes rises from about 333 million in 2005 to around 435 million, an increase of 30.6% in 2015. During the same period, the annual mortality rate from diabetes has increased from 1.2 million to 1.5 million (Ingelfinger and Jarcho, 2017). Given the increasing prevalence of diabetes and its complex etiology, diabetes adaptation strategies need to change management practices and current therapies. This change
should take place from the mere physical variables to psychosocial factors affecting diabetes management and its therapeutic programs (Mazloum Befruyi, Shams Esfandabad, Jalali, Afkhami Ardakani, Dadgari, 2015).

The psychological approach that widely used in diabetes is based on the type of patient's behavior. This approach states that people in a collision with a disease or a life-threatening factor create a general picture and a specific belief of the illness and its treatment in their minds, which is called the perception of the disease. This perception of the disease affects how the individual behaves, adapts to the illness, and treats the illness by the individual and, in general, as a result of the disease. Research in the field of perception of the disease shows that the perception of the disease consists of five different aspects: recognition of symptoms, duration of illness, cause of illness, result of illness and its curable condition (William et al., 2004). Studies show that diabetic patients' perceptions of diabetes are effective in managing patients' behavior about disease and thus controlling blood glucose (Baxter et al., 2004).

The International Diabetes Federation reported that there were 382 million diabetic patients around the world in 2013 and according to the organization, the number of them will reach 592 million in 2035 of which more than 80 percent live in low and middle income countries. This means that every 10 seconds, 1 person or each year 10 million people will be added to the statistics of people with diabetes (Raeis et al., 93). Therefore, this research seeks to develop a psychological model that is aimed at promoting and adapting to diabetes 2 and test the casual relation between perceived stress and social support by mediating psychological hardiness in life expectancy in Type 2 Diabetic Patients to follow the treatment and taking care of their health.

Method

The design of this study, based on the nature of the subject and the desired purpose, is a descriptive research of correlation type (Delavar, 2007). Statistical population: Muller (1999) uses a parametrical sample for estimating the sample size. He mentioned that the minimum of this ratio is 5 to 1, the average is 10 to 1, and the upper limit is 20 to 1. However, in the current study, considering the upper limit of sample size to the number of observed variables and free parameters, model complexity, free parameter estimation method (estimation of maximum correctness (need for high sample size), the amount of missing data (less than 5%) and the multivariate normalization relationship with the sample size of the original, provided that the sample size of 246 persons is sufficient to implement the structural equation modeling. The statistical population included all type 2 diabetic patients referring to Shiraz hospitals in Fars province who have been treated in diabetes clinics in 2016-17. According to Kline 1989, at least 20 samples should be considered for each parameter in the model. Since there are 9 components and parameters in the model, the sample size was considered to be 246 people, for more external reliability. The sampling method was available sampling. The research instruments included: Psychological Hardiness Questionnaire

The research tools are: Psychological Hardiness Questionnaire, Kobasa Hardiness Questionnaire (1984) has a 50 item, which contains 17 commitment questions, 16 challenge questions and 17 control questions which is based on the Likert scale, and is multiple question. Reliability of Hardiness Scale: In a study by Medi (1990), the reliability of the hardiness scale is reported which was acceptable. The studies show that hardiness components such as control, commitment, and challenge each have coefficients of 0.70, 0.52 and 0.52, respectively.

Perceived Stress Scale: It was designed in 1983 by Cohen et al., with three editions of 14, 10 and 4 items used for perceived stress in the last month and evaluates the thoughts and feelings about stressful events, control, overcoming and coping with mental pressure of experienced stress. The Cronbach's alpha coefficient for this questionnaire was reported in 0.84, 0.85 and 0.86 in a study (Cohen et al., 1983).

Snyder - Hope Scale: it was designed by Snyder et al, (1991) to evaluate the hope. In a research carried out by Golzari (2007) on 660 female students in Tehran province, the reliability of this scale was assessed by internal consistency method and the obtained Cronbach's alpha was 0.81.

The social support appraisals (SSA) scale: it was designed by Vaux A, Phillips J, Holly L, Thomson B, Williams D, and Stewart D in 1986, is the most prominent tool in this regard. It is also known in Iran as Vaux
social support appraisals (SSA) scale. The questionnaire is based on the Cobb theory of social support. Cobb defined social support as having the affection, assistance and attention of family members, friends and others. The Cobb social support appraisals (SSA) scale has 23 questions and two ways of scoring. This questionnaire measures three areas of social support: family, friends and others.

Data analysis method: SPSS 22 software was used for data analysis. The reliability of the research tool was measured using internal consistency of component method and Cronbach's alpha value. Multivariate regression test (for testing the mediation) was used. Maximum Alpha Error Level to test hypotheses was considered (05 / ≥ P). In order to analyze the data in addition to descriptive indexes related to each scale, a structural equation modeling (SEM) is used to study the main objective of the research. SPSS.22 and Lisrel Software was used to analyze the data. The path analysis method was used to investigate the casual effect of the variables considered in the hypothesized model as the cause, on the variables considered to be invalid.

Findings:

A total of 246 patients with type 2 diabetes participated in the study. Their average age was 35 ± 75 years, range from 35 to 75 years. Most of male patients (55%) and women (45%) were married, 35% were illiterate and 65% were illiterate.

<table>
<thead>
<tr>
<th>Commitment</th>
<th>0.521</th>
<th>0.122</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge</td>
<td>0.517</td>
<td>0.119</td>
</tr>
<tr>
<td>Control</td>
<td>0.467</td>
<td>0.084</td>
</tr>
<tr>
<td>Psychological hardiness</td>
<td>0.761</td>
<td>0.158</td>
</tr>
<tr>
<td>Hope</td>
<td>34.36</td>
<td>3.43</td>
</tr>
<tr>
<td>Thought, motivation, hope</td>
<td>33.34</td>
<td>3</td>
</tr>
<tr>
<td>Hope</td>
<td>37.13</td>
<td>3.49</td>
</tr>
<tr>
<td>Family support</td>
<td>33.33</td>
<td>13.3</td>
</tr>
<tr>
<td>Friends’ support</td>
<td>18.50</td>
<td>5.39</td>
</tr>
<tr>
<td>Self-acceptance</td>
<td>18.77</td>
<td>5.55</td>
</tr>
<tr>
<td>Others’ support</td>
<td>17.97</td>
<td>5.12</td>
</tr>
<tr>
<td>Social support</td>
<td>8.40</td>
<td>2.75</td>
</tr>
<tr>
<td>Optional perceived stress</td>
<td>9.89</td>
<td>2.94</td>
</tr>
</tbody>
</table>

The results of the Kolmogrov-Smirnov test show that the hypothesis of normal distribution of variables cannot be rejected (P > 0.01). The obtained significance level for all variables is more than the value of 0.01. In sum, the results indicate that the distribution of main variables does not have a significant deviation from normal distribution and it is possible to evaluate the distribution of research variables normal or close to normal and use parametric tests.
Pearson's parametric correlation test was used because the research variables are a combination of several indicators, and also the result of the normal test, it was shown that the distribution of variables is normal or close to normal. The results of the correlation between the variables are presented in Table 2.

Table 2: Mean, standard deviation and matrix of correlation coefficients between research variables and their components

<table>
<thead>
<tr>
<th>Variable</th>
<th>Life expectancy</th>
<th>Psychological hardiness</th>
<th>Perceived stress</th>
<th>Social support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy</td>
<td>1</td>
<td><strong>0.595</strong></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Psychological hardiness</td>
<td><strong>0.595</strong></td>
<td>1</td>
<td><strong>-0.65</strong></td>
<td><strong>-0.65</strong></td>
</tr>
<tr>
<td>Perceived stress</td>
<td><strong>-0.65</strong></td>
<td>-0.40</td>
<td>1</td>
<td><strong>-0.65</strong></td>
</tr>
<tr>
<td>Social support</td>
<td><strong>0.76</strong></td>
<td><strong>0.595</strong></td>
<td><em>0.34</em>*</td>
<td>1</td>
</tr>
</tbody>
</table>

Mean |

| 35.79 | 03.56 | 19.70 | **16.55** |

Standard deviation |

| 52.8 | 52.8 | 36.9 | **54.8** |

*P<0.05 **P<0.01

The results show a correlation between the hardiness and social support features, features psychological hardiness of commitment with family support and challenge with friends support and control with others support have a statistically significant positive relationship with social support for type 2 diabetic patients (P<0.05). There is a relationship between psychological hardiness and life expectancy.

Table 3: The Effect of mediating role of psychological hardiness on the relationship between perceived stress and life expectancy and social support

<table>
<thead>
<tr>
<th>Relationship type</th>
<th>b-value</th>
<th>Standard error</th>
<th>Standard coefficient</th>
<th>t-value</th>
<th>Sig level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 psychological hardiness on life expectancy</td>
<td>0.016</td>
<td>0.007</td>
<td>0.119</td>
<td>2.93</td>
<td>0.023</td>
</tr>
<tr>
<td>Step 2 psychological hardiness on social support</td>
<td>0.088</td>
<td>0.036</td>
<td>0.125</td>
<td>2.45</td>
<td>0.015</td>
</tr>
<tr>
<td>Step 3 psychological hardiness on perceived stress</td>
<td>-0.011</td>
<td>-0.004</td>
<td>-0.009</td>
<td>2.23</td>
<td>0.028</td>
</tr>
</tbody>
</table>
Life expectancy for type 2 diabetic patients is predictable based on perceived stress.

Table 4: Summary of multiple regression analysis with step by step model to predict life expectancy

<table>
<thead>
<tr>
<th>Predicting variables</th>
<th>R</th>
<th>R2</th>
<th>R2 changes</th>
<th>Sig level</th>
<th>β</th>
<th>Sig level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>0.53</td>
<td>0.44</td>
<td>0.44</td>
<td>0.001</td>
<td>0.332</td>
<td>0.001</td>
</tr>
<tr>
<td>psychological hardness</td>
<td>0.57</td>
<td>0.46</td>
<td>0.46</td>
<td>0.001</td>
<td>0.343</td>
<td>0.001</td>
</tr>
<tr>
<td>perceived stress</td>
<td>0.35</td>
<td>0.25</td>
<td>0.25</td>
<td>0.001</td>
<td>-0.21</td>
<td>0.005</td>
</tr>
</tbody>
</table>

β = standardized coefficient of regression.

Table 5: Indices related to the path of psychological well-being and self-efficacy model with psychological hardness and self-esteem of benign brain tumor patients.

<table>
<thead>
<tr>
<th>Index</th>
<th>Coefficients β</th>
<th>Standard coefficients</th>
<th>T- ratio</th>
<th>P-Level</th>
<th>Fitness index of RSMEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological hardness on life expectancy</td>
<td>0.21</td>
<td>0.21</td>
<td>5.35</td>
<td>P ≤ 0.00</td>
<td>RSMEA ≤ 0.0001</td>
</tr>
<tr>
<td>Social support to life expectancy</td>
<td>0.22</td>
<td>0.22</td>
<td>5.01</td>
<td>P ≤ 0.00</td>
<td>RSMEA ≤ 0.0001</td>
</tr>
<tr>
<td>Perceived stress to life expectancy</td>
<td>-0.31</td>
<td>-0.31</td>
<td>4.50</td>
<td>P ≤ 0.00</td>
<td>RSMEA ≤ 0.0001</td>
</tr>
<tr>
<td>Perceived stress to hardness</td>
<td>0.47</td>
<td>0.47</td>
<td>6.95</td>
<td>P ≤ 0.00</td>
<td>RSMEA ≤ 0.0001</td>
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<tr>
<td>Social support to hardness</td>
<td>0.38</td>
<td>0.40</td>
<td>7.5</td>
<td>P ≤ 0.00</td>
<td>RSMEA ≤ 0.0001</td>
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</table>

Diagram 1: Standards of the components of the mediating variable of psychological hardness. Second factor analysis in significant level (relationship between variables and psychological hardness items).
The model shows the second order confirmatory factor analysis in a significant level (t-value). This model actually tests all the first and second order first order (factor loads) equations using the t statistic (it is noted that if the absolute value of t-value is more than 1.96, then it is significant). According to this model (Fig. 1), the calculated t-values for all first and second order factor loads are larger than 1.96, thus, at 95% confidence level, are significant. Therefore, it is possible to reconcile the questions of the questionnaire to measure the concepts at this valid stage. In fact, the results show that what the researcher has been trying to measure by the questions of the questionnaire has been realized by this tool.

Figure 2: A quadratic model of life expectancy with social support and perceived stress by mediating a psychological hardness variable (with influencing coefficients).

The life expectancy model of type 2 diabetic patients is fitted with a social support variable through mediation of psychological hardness.

Table 6: Investigating Indices of Model Fitness

<table>
<thead>
<tr>
<th>Indices</th>
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<td>K square</td>
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<td>Degree of freedom</td>
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<td>GFI</td>
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<td>CFI</td>
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<tr>
<td>AGFI</td>
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<tr>
<td>CMIN</td>
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<tr>
<td>VALUE-P</td>
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<tr>
<td>NFI</td>
<td>0.91</td>
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</table>
Discussion

The purpose of current study investigated the casual relation between perceived stress and social support by mediating psychological hardiness in life expectancy in Type 2 Diabetic Patients by SEM. The results of descriptive indices showed that 246 patients with type 2 diabetes participated in the study. A total of 246 patients with type 2 diabetes participated in the study. Their average age was 35 ± 75 years, range from 35 to 75 years. Most of male patients (55%) and women (45%) were married, 35% were illiterate and 65% were illiterate.

The Kolmogorov-Smirnov statistical test was used to determine the data distribution (normal). The results of the Kolmogorov-Smirnov test showed that the assumption of normal distribution of variables cannot be rejected (P > 0.01). The obtained significance level for all variables is more than the value of 0.01. In sum, the results indicate that the distribution of main variables does not have a significant deviation from normal distribution and it is possible to evaluate the distribution of research variables either normal or close to normal and use parametric tests.

Table 1 shows the values of the Kolmogorov-Smirnov test for evaluating the normal variables and the variables are normal.

Inferential statistics include a series of statistical methods that provide predictions based on sample information about population characteristics. The primary focus of most research is on the studied parameters of the population. Samples and descriptive statistics are only important to provide information about population parameters. Therefore, an important aspect of statistical inference is including the report from the probable accuracy or degree of confidence of a sample statistic that predicts the population parameter (Agresti & Finale, 1997). Then, using Pearson correlation test and regression test (to examine mediation), the hypotheses and research relationships were tested.

There is a relationship between psychological hardiness and stress and illness (Weibe and Williams, 1992). Weibe and Williams have presented a conceptual model of the relationship between psychological hardiness with stressors and health based on a physiological-psychosocial view. According to the Weibe and Williams model, the threat of an event and the unproductive coping responses are a factor in increasing the physiological excitability and repeated and prolonged physiological excitation also leads to pressure and impairment of the immune system and ultimately leads to illness, but psychological hardiness prevents a negative and harmful physiological excitation by changing the assessment of events and coping responses.

Adams 11 and Bier (22) (1986) concluded that social support works not only as a shock and shield against stress, but also increase the harmony of the immune system. There is considerable evidence that social support at work or at home may provide a lasting protection against the effects of stress. It has also become clear that the existence of supportive systems, such as extended families, working groups, friends and associations, facilitates coping with problems, rehabilitation and recovery (Powell 3 3, Translated by Bakhshipour and Roodsari, 2010). The results of this study are consistent with the results of Powell and Roodsari (2010) and Adamz and Bier (1986).

There is a relationship between psychological hardiness and life expectancy. The result is a correlation between psychological difficulties with life expectancy (Table 2) which is significant at 95% confidence level (P< 0.05).

Kobasa (1979) considers stubbornness to be a personality trait that acts as a source of resistance and protective shield in the face of stressful life events. Hardiness is a belief that, according to that, provides a change in the ordinary aspect of life and an opportunity to grow and learn more (Arbes, Kohli, Ferrer-Averboch, Barry et al., 2011). Crawley's research, Haislip and Habi (2003) suggests a relationship between hardiness and coping strategies and life satisfaction. Nayeri and Ayoubi (2011) have shown that the overall score of psychological hardiness and the control component have the predictive power of psychological well-being. Salehi and Besharat (2010) showed that psychological hardiness is related to mental health. Stadinger, Durner and Michel
(2005), Francis (2006), and Capra and Wasteka (2005) also showed that feeling of control over events and high self-efficacy increased the level of mental well-being and life satisfaction.

Hardiness is not like a reckless attack, it is the ability to understand the situation and the surrounding environment and the ability to make self-decision or, in other words, make decisions about yourself (Kosaka, 1996, quoted by Goudarzi, 2002). Kobasa et al, state that the psychological flexibility of hard-core people does not merely spill over from the individual effects of these three components, but because of a particular coping style that is consistent with the dynamical composition of these three components (Yarkorundal, 1998, quoted by Goudarzi, 2002).

In fact, hardiness is a single structure that integrates its components, in other words, the hardiness eliminates the differentiation of its components and creates a homogeneity among them (Kobasa et al., 1981, quoted by Goodarzi, 2002). Kobasa points out the delicate points in Sileh work (1956) in an attempt to reach the effective factors of stress response that controls the negative impact of stressful events.

Baron and Kenny frameworks were used to investigate the mediating role of variables. The results indicate that psychological hardiness has a significant effect on life expectancy (P <0.05). In this sense, psychological hardiness has been able to play a significant role in mediating between social support and perceived stress with life expectancy. The severity of the effect of psychological hardiness on life expectancy at the first stage is 0.119 and it is significant (Fig. 3). The life expectancy of type 2 diabetic patients is based on perceived stress and social support variables through mediation of predictable psychological hardiness.

The results of this study are consistent with the results of Kohasa (1979) and Goudarzi (2002) and Capra and Wasteka (2005).

Generally, diabetic diagnosis imposes severe stress on an individual and it is clear that prolonged diabetes treatment (because it occupies a significant part of the person's life) turns stress into chronic stress and ultimately psychological disturbances lead to lower quality of life in the affected population (Hoffman, Zevon and D. Arrigo and Cechini, 2004; Carlson, Angen & Cullum, 2004; Faul, Jim, Williams and Jacobsen, 2011, quoted by Stafford, Foley, Jood et al., 2013). The moderating effect of social support that helps to alleviate the effects of acute and chronic nervous pressure on health and also increases the adaptation to the stressor of diabetes mellitus (Zare Shahabadi et al., 2010).

Table 3 and 4 of the study show the effect of mediation of psychological hardiness in the relationship between perceived stress and life expectancy and social support indicates the role of mediating psychological hardiness for transferring the effect of perceived stress and social support as predictor variables for the criterion of life expectancy. Because the amount of Beta factor is 0.119 at a significant level. Therefore, life expectancy for type 2 diabetic patients is predictable based on the perceived stress variables.

Table 4 shows a summary of multiple regression analysis with stepwise model for predicting life expectancy indicates that changes in predictive variables such as social support, and psychological hardiness and perceived stress with the level of standardized regression coefficient have a significant acceptable coefficient, considering the negative load of perceived stress, the negative reversal has been made toughness. The changes in R2 at the significant level (0.001) β were 0.44 and 0.33 respectively.

Life expectancy for type 2 diabetic patients is predictable based on the social support variable mediated by psychological hardiness.

Table 5 shows the estimation of the indirect impact coefficients and the overall mediator model of relationships between life expectancy, psychological hardiness, perceived stress, and social support. According to the results, the coefficients of the life expectancy variable are predicted to be as high as 0.58 and the hardness predicted.p a life expectancy of 0.49. Also perceived stress has predicted the effect of life expectancy as much as -0.33. Social support has predicted a hardness effect as high as 0.47. Therefore, the mediation of hardness is confirmed in the model and it has a complete and direct mediator. One of the most important factors influencing life expectancy and longevity is the hope of recovery and continuity of life (Wilson, translated by Bajelan Farokhi,
2009). Hope has biological effects and can have a positive effect on the control of pain and physical disabilities in patients. Hope and expectation are the cause of activation of brain circuits and the release of endorphin and Ankfalin, therefore reducing pain in the body (Schneider et al., 2005; Seligman et al., 2000). Future orientation, positive expectations, purposefulness, realism, goal setting and internal communication are among the most important features of hope (Benzein & Saveman, 1998). Schneider's research, the founder of the theory of hope and its treatment on mental illness and some physical illnesses, such as diabetes, shows that many mental illnesses and some physical illness occur in response to loss of hope. And therapeutic hope can improve mental health and self-efficacy of patients (Schneider and Lopez, 2001; Schneider et al., 1991). On the other hand, diabetes seems to have the greatest impact on hope compared to other chronic diseases (Roleight, 1992).

One of the factors that causes diabetes to facilitate the process of atherosclerosis is oxidative stress (Hematabadi et al., 2009). In diabetic patients, high blood sugar can lead to increased oxidative stress and as a result, changes in the structure and function of lipids and proteins (Maxwell et al., 1997). Lipid peroxidation leads to the formation of toxic aldehyde, such as malon dialdehyde (Esterbaue et al., 1991). It has been determined that social support dimensions are considered as the strongest and the most powerful coping forces for the successful and easy confrontation of individuals during conflict with stressful conditions which facilitates difficulty tolerance (Lee et al. 2007).

Table 6 shows the indicators of life expectancy model pathways in type 2 diabetic patients based on social support variable with mediating psychological hardiness of type II diabetic patients and multi-variable correlation coefficients along with determining coefficients and changes of determining coefficients for predicting life expectancy variables. Table 5 presents the multivariate correlation coefficients along with determining coefficients and changes in determining coefficients of life expectancy predictor variables and psychological hardiness of perceived stress with social support as predictors of model variables and these factors ultimately determine 54% of life expectancy variance.

Chart 1 shows the standard of psychological hardiness components of second-order factor analysis in significant situation (relationship between variables and psychological hardiness). The model shows the second-order confirmatory factor analysis in a meaningful state (t-values). This model actually tests all the first and second order (factor load) equations using t-values. (It is to be noted that if the value of the absolute power of the t-value is more than 1.96, then it is significant). According to this model (Fig. 1), the calculated values of t for all first and second order factor loads are larger than 1.96 thus, at 95% confidence level, are significant. Therefore, it can be shown that the questionnaire is consistent with the measurement of the concepts at this valid stage. In fact, the results show that the researcher has tried to measure them using questionnaire questions.

Table 6: The model's fitness indices are: RMSEA = 0.078, P-VALUE = 0.000, GFI=0.85, AGFI = 0.85, CFI=0.95, CMIN = 2.2, CFI =0.95, NFI=0.98, df= 583, \( \chi^2 \) =583, \( df \) =0.46. So the model is GOOD FITNESS because all of the model's indices correspond to the standard fitness indices. Table 6 is indices of the model's fitness model, the purpose of fitting the model is to what extent a theoretical or conceptual model is determined or how it is adjusted to the data obtained from the statistical population. (Houman, 2005, 422).

Thus, life expectancy model of type 2 diabetic patients based on the social support variable is fitted with mediating psychological hardiness. The life expectancy model for type 2 diabetic patients is predictable based on the social support variable mediated by psychological hardiness.

Hard people often consider life as a positive and useful experience, and they make a sense of commitment to it (Maddi and Kobasa, quoted by the Mojalal Safari, 2009). Kobasa and Medi (1977) introduce hardiness as instruments of the three elements mentioned above that these people believe in what others do, and dedicate themselves to the purpose they are doing (Commitment). They also feel that they are dominant and self-determining. (Control). They consider life changes a challenge and opportunities for growth and development, not limitation and threat (challenging); (Kobasa, 1979; quoted by Besharat et al., 2009).
Given the Lisrel output, it is the value of the model. Regarding the output of the Lisrel, the value x², the K-square to the degree of freedom is 2.46, which is the appropriate value. The low level of this index indicates a slight difference between the conceptual model of the research and the observed data of the research. Also, the RMSEA output is 0.05, for the model, it is less than 0.08. In addition to x², the RMSEA index is lower, the model has a better fit (Hooman, 2005, 422).

According to the values of the indicators in Table 6, the model has desired fitness. The value of k-square is less than the number three. Also, the RMSEA value is 0.05 and less than 0.08 and the indicators (GFI, AGFI, CFI) are all greater than 0.90. So the model is well-fitted and approved. RMSEA: root mean square error approximation (less than 0.80 acceptable.), RMSEA: Root Mean Squares Approximation Error (Less than 80.) Acceptable. (χ² : K-square not meaningful). χ²/df : K-square on degree of freedom (less than 3). GFI: Fitness Index (greater than 0.90). AGFI: Adjusted fitness index (more than 0.90). NFI: soft fit index (more than 0.90). NNFI: Normal fit index (greater than 0.90). CFI: Comparative fit index (more than 0.90). The P-VALUE index is less than 0.05. The RMSEA index is between 0.05 and 0.08. The GFI index is between 0.95 and 1. The AGFI index is also between 0.9 and 1.

**Conclusion**

This model is effective in improving the Health promotion and coping of the disease in type 2 diabetic patients and it has an acceptable fitness. In the treatment process, Social team work, especially health psychologists, is bound to have supportive psychotherapy role for type 2 diabetic patients. Therefore, considering the importance of maintaining and improving the quality of life of patients with type 2 diabetes, the study of perceived stress and social support by mediating psychological hardness and intervention to increase the life expectancy and psychological rehabilitation of these patients is recommended for improvement and adaptation to the disease. In the present study, there was a significant positive relationship between life expectancy, psychological hardness and social support and patients who had a better life expectancy had better health and quality of life. And hardness has direct mediating role on life expectancy through the transfer of the predictive variables effects of social support and perceived stress and the life expectancy model for type 2 diabetic patients is predictable based on the social support and perceived stress level mediated by psychological hardness and it has acceptable fitness.

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EFFECTS OF FOOT REFLEXOLOGY MASSAGE ON PAIN AND FATIGUE IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFT

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ABSTRACT

Background and objectives: Pain and fatigue are of prevalent complaints among patients following heart surgery. Hence, although the use of analgesics is the most common intervention to reduce pain, but nonpharmacologic approaches to alleviate pain could be useful due to the side effects of excessive drug administration and high costs. The present study was conducted to determine the effect of foot reflexology massage on reducing pain and fatigue in patients undergoing coronary artery bypass graft (CABG).

Materials and methods: In this randomized controlled trial (RCT), 100 male and female patients over 18 years old undergoing CABG in Cardiac Surgery ICU at medical centers in Shiraz, Iran, were assigned to one of two intervention and control groups. In the intervention group, the reflexology massage was carried out on the second day after surgery for 30 minutes on foot (preferably the left foot), at the end of the evening shift between the hours of 5 and 7 pm. In the control group, the patient’s foot was only rubbed for 30 minutes without applying any pressure. The severity of pain and fatigue was measured using Numeric Rating Scale (NRS) 10 minutes before and 10 minutes, 30 minutes and 24 hours after the intervention, and then compared between the two groups.

Results: The severity of pain and fatigue in the first 10 minutes after intervention was lower in the group receiving reflexology massage compared to control group (p=0.016). The severity of pain and fatigue in 30 minutes and 24 hours after intervention showed no statistically significant difference between the two groups.

Conclusion: According to our findings, the use of foot reflexology massage in temporary reduction in the severity of pain and fatigue is effective in patients, and can be useful as one of the non-invasive nursing actions and non-pharmacological methods to reduce pain and fatigue.

Keywords: Reflexology, Pain, Fatigue, CABG

INTRODUCTION

Coronary artery disease (CAD) is the most important cause of mortality and morbidity in developed countries, as well as is responsible for about one third of deaths over 35 years of age, resulting in the death of 17 million people each year (1). About 83.6 million people in America are experiencing at least one type of the CAD, which is also responsible for 46 percent of all deaths in Iran (2).
The coronary artery bypass graft surgeries may be regarded as one of the main and common techniques used in the treatment of CAD that are performed with quite extensive in order to increase survival and improve the quality of life in patients with severe narrowing of coronary artery that has not respond to the other therapies (3). Surgery as a routine therapeutic method causes pain and anxiety in patients and as potential important risk factor endangers the patient's health, and can make psychological reactions like anxiety and physical reactions like changes in physiological functions of the body such as increased blood pressure, pulse rate and pain. Effective pain relief has great impact on the pace of recovery and faster return to previous activities (4, 5). Despite the large number of cardiac surgery, these patients still experience considerable pain during the critical period after surgery (6). Diagnosis and treatment of pain are of the most ancient sciences that man has tried to acquire and complete it with unremitting and tireless efforts and has managed to earn lifesaving and wonderful achievements as well. According to the International Association for the Study of Pain (IASP) in 2015, the pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. The pain control is expressed as an important part of the care, so that the American Pain Society suggests that pain is the fifth vital sign and states that the pain should be assessed routinely while taking blood pressure and pulse (5, 7). The pain in the patients can cause respiratory movement restrictions, inability to cough, atelectasis and increased the complications of postoperative mobility (6). The pain allows releasing catecholamines and consequently increased heart rate and blood pressure, which can lead to myocardial ischemia in susceptible patients (5). This impairs the healing process after surgery. The pain also affects the mobility of patients after surgery and gives rise surgical complications. Accordingly, effective management of pain results in reduced cardiopulmonary complications after heart surgery (8).

Fatigue is another complication of cardiac surgery, which is attributed to intraoperative injury into the heart muscle tissue, decline in cortisol and heart dysfunction. Fatigue and respective exhaustion, in addition to quality of life, destroy physical ability after heart surgery. More importantly, the presence of fatigue is considered as a predictor index for future cardiac events, including myocardial infarction (6). Although pharmacotherapy is the most effective means available to nurses for reducing pain and fatigue, but it is important to use nonpharmacologic methods along with these medicines to eliminate pain and fatigue because of the side effects of analgesics, opioids and differences in the response to them. In recent years, some investigations have been done on non-drug methods, including reflexology. The use of this technique has increased recently in health care units. Many institutions have employed this intervention to treat patients and even help healthy individuals (9). Foot reflexology is among the six most widely used methods for complementary and alternative medicine in Norway, Denmark and the United Kingdom (10). Reflexology is a complementary therapy in medicine and in the treatment group of hand massage whose basic principle is the use of specific touching or pressing techniques on reflexology points of hands and feet to make biophysiological changes in the body (5). The reflex points on the soles of the feet and hands as small mirrors can reflect all parts of the body. Arrangement of various body parts on the feet is similar to their position in the body (11). In addition, massage by affecting the nervous system, muscles and blood flow causes muscle relaxation, increased blood flow and oxygenation. Increase blood flow in the area of massage improves nutritional status and excretion of waste products such as lactic acid, leading the release of energy and the elimination of fatigue (6). Mechanical stimulations through the massage cause the release of central analgesic agents from midbrain, such as beta-endorphin and enkephalin that inhibit pain with penetration into the spinal dorsal horn. Because 15 minutes are required for the effect of massage on pain, so it takes 15 minutes to increase the level of endorphins and enkephalins (12).

To date, many studies have examined the foot reflexology massage as a non-invasive nursing intervention in different conditions. The results confirm that foot reflexology brings significant reduction in pain and fatigue in patients following CABG, systolic blood pressure in patients undergoing CABG and pain intensity in patients with abdominal and chest surgeries and subsequently reducing the need for analgesic drug of pethidine (8, 10).

With regard to the further length of hospitalization in these patients and the importance of reducing complications after heart surgery especially pain that rises in the early days after surgery, deep breathing, coughing, working with spirometry, activity in bed and having chest tube as well as due to conflicting results regarding the effect of foot reflexology in reducing postoperative complications (13), there is a need for strong research support to use this method as a complementary therapy along with drug therapy because of low cost and no side effects to the nursing community in the intervention and application for enhancing patient comfort and health. Therefore, this study was
conducted to evaluate the effect of foot reflexology massage on reducing pain and fatigue in patients undergoing coronary artery bypass graft surgery.

MATERIALS AND METHODS

This randomized controlled trial (RCT) was carried out in 2016 on 100 male and female patients over 18 years old undergoing CABG in Cardiac Surgery ICU at medical centers in Shiraz (Namazi, Shahid Feghhi, Ghalb-e-Alzahra and Shahid Beheshti Hospitals). Inclusion criteria for the study were willingness to participate in the study, experiencing heart surgery for the first time, non-emergency open heart surgery, age over 18 years, the absence of structural deformity in the feet, full consciousness after surgery, no addiction to drugs or alcohol, lack of sensory and motor disorders, lack of hearing and visual impairment and no history of foot reflexology massage. Exclusion criteria included arterial line on foot, blood disorders, thrombocytopenia, need for intra aortic balloon pump (IABP), intubation for more than 24 hours, bleeding more than 200 ml per hour of chest tubes, repair or replace the valve with CABG, infectious lesions and skin diseases in the feet, cardiac pacemaker, remobilization to the intensive care unit for further care and lack of access to suitable environmental conditions for intervention during research.

The patients were assigned to one of two intervention and control groups using Stratified Block Randomization. The considered intervention in this study was the foot reflexology massage. The patients in the intervention group were quiet for five minutes while they were lying with comfortable dress and in a situation that the palms were open and outward; a pillow was placed under the head and between the knees. The massage duration was varied between 25 to 30 minutes and was carried out on the second day after surgery (at least 18 hours after surgery) at the final hours of the evening shift, while at least four hours had passed since the last taking painkiller.

During performing massage, curtains were closed around the patient and external noises were minimized by expelling visitors. The massager sat on a chair beside the patient after washing and warming up the hands, and then the patient's foot was oily with a little olive oil. The massage was performed for 30 minutes (12); including first and last 5 minutes for doing relaxation actions on foot, and 20 minutes for foot reflexology massage first in the entire sole of the foot (preferably left foot) and then in the areas related to thorax and heart. The reason for selecting left foot in this study was based on the principle of reflexology, so that the left parts of the body is associated with the reflex points on left palm and sole and right parts of the body are in line with the reflex points on right palm and sole. Hence, stimulation of the reflex points on the left palm or sole is preferable to reduce the pain associated with surgery, often located on the left side. Since the soles of the feet have the points without any lids, bandages and venipuncture, so the sole of the left foot is preferred. The massage was done in this way. The outer edge of the foot was moved forward and backward using the palm of the hand. In patients who are difficult to relax, reflexology was applied with the thumb or index finger on Solar Plexus areas on soles of the feet. After that, reflexology was carried out using Ingham method aimed at stimulating the whole body, modifying the wastes and increasing relaxation on all parts of the soles of the feet, especially the points related to endocrine glands and Solar Plexus areas.

In the control group, the patient's foot was only rubbed for 30 minutes without applying any pressure, and the researcher was present at the bedside. The severity of pain and fatigue was assessed at different times (10 minutes before intervention, 10 and 30 minutes and 24 hours after intervention). Noise pollution, pager sound, voices in the ward and alarms of devices can interfere in the procedure, which were attempted to be controlled as much as possible.

The primary outcome of interest in this study was the severity of pain and fatigue that was measured using Numeric Rating Scale (NRS) at different times. Numeric pain scale includes a 10-cm horizontal line graded from zero to ten; zero shows the absence of symptoms of pain and fatigue and ten indicates maximum severity of symptoms. The severity of pain was measured and recorded in 10 minutes before intervention, 10 and 30 minutes and 24 hours after intervention. The amount received narcotic drugs in each group was measured and evaluated by Medication Schedule Checklist. The data were analyzed in SPSS version 22 software through descriptive and inferential tests (independent t-test, one-way ANOVA, chi square test in the case of normal distribution of data and non-parametric Mann-Whitney test). The significance level was set at 0.05.
Research Ethics Committee of Bushehr University of Medical Sciences and Health Services approved the present study (bpums.rec.1394.25). Written informed consent to participate in the study was obtained from all patients. As well, the necessary authorizations were received from government hospitals in Shiraz to start and conduct the research. Before entering the first sample, the study was recorded in the Iranian Registry of Clinical Trials (IRCT2015112122466N7)

CONSORT 2010 Flow Diagram

Assessed for eligibility (n=100)

Randomized (n=100)

Excluded (n=0)
Not meeting inclusion criteria (n= 0)
Declined to participate (n= 0)
Other reasons (n=0)

Allocation

Allocated to intervention (n= 50)
Received allocated intervention (n=50)
Did not receive allocated intervention (give reasons) (n= 0)

Allocated to intervention (n=50)
Received allocated intervention (n=50)
Did not receive allocated intervention (give reasons) (n= 0)

Follow-Up

Lost to follow-up (give reasons) (n= 0)
Discontinued intervention (give reasons) (n=0)

Lost to follow-up (give reasons) (n= 0)
Discontinued intervention (give reasons) (n= 0)

Analysis

Analysed (n=50)
Excluded from analysis (give reasons) (n=0)

Analysed (n=50)
Excluded from analysis (give reasons) (n= 0)
Results

In total, 100 patients participating in this study consisted of 50 in the intervention group and 50 in the control group, and each group included 25 males and 25 females. All 100 people participated in the study. Evaluation of basic characteristics and levels of pain (pain, numbness, pain perception and pain vary) in the two intervention and control groups before intervention showed no significant differences between the two groups in terms of effective variables. Table 1 shows the results of comparing the basic variables before intervention.

Table 1 - Determine the severity of pain before intervention between the two intervention and control groups in terms of demographic information

<table>
<thead>
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<th>Variable</th>
<th>Intervention</th>
<th>Control</th>
<th>P value*</th>
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<tbody>
<tr>
<td>Age (years) o</td>
<td>62.30±9.48</td>
<td>58.78±10.44</td>
<td></td>
</tr>
<tr>
<td>Weight (kg) o</td>
<td>70.82±19.86</td>
<td>71.66±12.54</td>
<td></td>
</tr>
<tr>
<td>Height (cm) o</td>
<td>165.86±9.06</td>
<td>168.22±10.44</td>
<td></td>
</tr>
<tr>
<td>Body mass index o</td>
<td>25.64±6.10</td>
<td>25.39±4.54</td>
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</tr>
<tr>
<td>Gender*</td>
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<tr>
<td>Female</td>
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</tr>
<tr>
<td>Married</td>
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<tr>
<td>Single</td>
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<td>0 (0)</td>
<td></td>
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<tr>
<td>Divorced</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Deceased spouse</td>
<td>5 (10)</td>
<td>12 (24)</td>
<td></td>
</tr>
<tr>
<td>Educational level o, °</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>24 (48)</td>
<td>25 (50)</td>
<td></td>
</tr>
<tr>
<td>Reading and writing</td>
<td>13 (26)</td>
<td>11 (22)</td>
<td></td>
</tr>
<tr>
<td>Under diploma</td>
<td>5 (10)</td>
<td>4 (8)</td>
<td></td>
</tr>
<tr>
<td>High school diploma or higher</td>
<td>8 (16)</td>
<td>10 (20)</td>
<td></td>
</tr>
<tr>
<td>History of smoking o, °</td>
<td>16 (32)</td>
<td>20 (40)</td>
<td></td>
</tr>
<tr>
<td>Family history of heart disease o, °</td>
<td>19 (38)</td>
<td>23 (46)</td>
<td></td>
</tr>
<tr>
<td>History of respiratory disease o, °</td>
<td>12 (24)</td>
<td>9 (18)</td>
<td></td>
</tr>
<tr>
<td>Baseline pain (before intervention) o</td>
<td>5.45±2.49</td>
<td>5.20±1.81</td>
<td></td>
</tr>
</tbody>
</table>

° (Mean ± SD)  
° ° Frequency (percent)

Compare the two intervention and control groups indicated that the differences in the severity of pain and fatigue before intervention was not statistically significant between the two groups. Comparison of pain intensity after the intervention (Figure 1) showed that the difference between the two groups 10 minutes after intervention was statistically significant (p=0.016). This comparison 30 minutes and 24 hours after intervention showed no statistically significant difference (respectively p=0.115 and p=0.980). Table 2 and Figure 1 compare the changes in the mean severity of pain and fatigue before and after the intervention between the intervention and control groups.

Table 2 - Comparison of changes in the mean severity of pain and fatigue before and after intervention between the two intervention and control groups

<table>
<thead>
<tr>
<th>Time</th>
<th>Intervention, Mean±SD</th>
<th>Control, Mean±SD</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10m Before</td>
<td>5.45± 2.49</td>
<td>5.20± 1.81</td>
<td></td>
</tr>
<tr>
<td>10m After</td>
<td>4.57± 2.12</td>
<td>4.70± 1.67</td>
<td>0.016</td>
</tr>
<tr>
<td>30m After</td>
<td>5.73± 11.59</td>
<td>4.32± 1.68</td>
<td>0.115</td>
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<tr>
<td>24h After</td>
<td>3.43± 2.05</td>
<td>3.24± 1.92</td>
<td>0.980</td>
</tr>
</tbody>
</table>

* P Values are related to changes from baseline
DISCUSSION

The results of the current study suggest that reflexology causes temporary improvement of pain and fatigue (in the first 10 minutes after intervention) in patients after coronary artery bypass graft surgery.

The results consistent with the findings of Bagheri Nsamy et al. (2012) indicated that the foot reflexology massage caused a significant reduction in pain and fatigue in patients after coronary artery bypass graft surgery. In their study, the patients’ feet in the control group were oily only one minute. In the present study compared to the study of Bagheri Nsamy et al., the duration of intervention and placebo was identical in the two groups. In the control group, the patient’s feet were rubbed for 30 minutes without applying any pressure to dictate intervention to the patient, as well as the present study was conducted with a larger population compared to the study of Bagheri Nsamy et al. (6). In the study of Mohammad Aliha et al. (2013), the foot reflexology massage was performed in the three intervention, placebo and control groups during the first 24 hours after surgery, and pain was assessed at 0-25-35 minutes and 24 hours later by Visual Analogue Scale (VAS). The result was a reduction in pain (5), which is in line with the present study. In their study, no massage was performed in the control group, simple foot massage was done in the placebo group and zigzag massage was performed by in the intervention group. The method of intervention is not consistent with our study; because in this study, first the relaxation and then the foot reflexology massage were carried out in all the reflex points of the body and finally in the points of chest and heart, based on the principles of reflexology. Zigzag actions can be a relaxation technique and may therefore involve accidently the points related to the project. In addition, analgesic drugs were used in the control and placebo groups, which can be confounding variable affecting the result of intervention. In the present study, in case of taking analgesic drugs, the intervention was delayed for 4 hours and was considered well in this study (5). The result of Nazimzade et al. (2012) is in line with the current study; intervention method is consistent with the present study as well. However, the times of intervention assessment was before and after the first session, before and after the third session and three weeks after the end of the third session due to the long duration of assessment and use of analgesics by patients with chronic pain that might be used such drugs at the time of assessment could affect the results of the study (12). Rigi (2014) did not articulate the assessment minutes after intervention, but only assessed the impact of massage twice within 30 minutes after the intervention. Therefore, its impact could be different in the first and last moments
Khoshtarashan et al. (2010) showed that pain intensity after reflexology massage on patients after cesarean section was declined significantly in the intervention group (15).

The results from this study are different from previous findings about the effectiveness of reflexology massage on pain and fatigue. For example, the study of Sadeghi et al., their results showed that reflexology massage had no effect on physiological parameters and sternotomy pain after heart surgery. The reason for the inconsistency could be the lack of systematic method of foot reflexology. Left foot in the placebo group received massage similar to the right foot in the intervention group (13). An important consequence of this research is that reflexology massage has no significant impact given the statistically significant difference of this intervention. The reflexology massage can be used as a non-invasive complementary therapy along with other therapeutic interventions.

Strengths and weaknesses of the study:

The strength of this study was to measure the intensity of pain during the three phases in two consecutive days. One limitation of the present study included low literacy in these patients because of old age, cultural and linguistic differences, which led to the need to spend more time for further explaining that in itself caused delays in the implementation of intervention. Another limitation was the noise pollution, including sound alarm of devices connected to patients, such as ventilator of other patients, monitoring, attached syringe pumps, hospital pager and personnel voice. Relatively small sample size was also one of the limitations of this study. Given that the main outcome variables of pain and fatigue are subjective factors, so conducting studies with larger sample size can be helpful to a large extent. On the other hand, double blinding was not possible given the nature of intervention, which is another limitation in this study.

Conclusion

The scales used in this study will contribute to the use of non-invasive treatment approaches such as reflexology due to the lack of side effects, easy procedure, low cost and the ability to learn medical personnel and caregivers in health centers as complementary therapy to reduce temporarily pain and fatigue immediately after the massage. Therefore, there is need for further studies with larger sample size in future investigations to make greater use of foot reflexology and its introduction to medical centers.

Acknowledgments

Authors hereby would like to thank all the patients who cooperated in adverse conditions of illness as well as Deputy of Research at Shiraz University of Medical Sciences, affiliated hospitals and colleagues (physicians and nurses) in cardiac surgical ward that helped us in this study. This study was completed with the financial support of Deputy of Research at Bushehr University of Medical Sciences and has been adapted from M.Sc. thesis in nursing.

References


