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Table of Contents

- | | | |
|----|---|--|
| 3 | Effects of Communication Skills Training on Aggression and Quality of Lives of Male Patients with Chronic Mental Illnesses | Khodabakhshi Koolaee, A., Ebrahim Baighi, H., Navidian, A. |
| 11 | Effects of Reflexology on Sleep Quality of Elderly Women Undergoing Abdominal Surgery | Kheyri, A., Bastani, F., Haghani, H. |
| 19 | Exploring the Challenge of Adoption from the Perspective of Iranian Infertile Women | Hasanpoor-Azghady, S, B., Simbar, M., Vedadhir, A., Amiri Farahani, L. |
| 27 | The Effect of Teaching Coping Skills on the Anxiety of Caregivers of Patients with Cancer Undergoing Chemotherapy | Seyedolshohadaee, M., Ayar, P, M., Mardani, M., Haghani, H. |
| 37 | Comparing the Effect of Acupressure and Cryotherapy on the Pain Caused by Removal of Chest Drain Tube in the Elderly Patients Undergoing Open Heart Surgery | Bastani, F., Hajizadeh, S., Sa`atchi, K., Haghani, H. |
| 53 | The Effect of Self-Management Training Using CD on the Quality of Life of the Patients with Chronic Heart Failure | Najafi Ghezeljeh, T., Abbasi, A, R., Oshgholi Farahani, M., Naderi, N. |
| 63 | Study of the Stature Structure of 10-12 Years Old Female Students in Selected Elementary Schools in Tehran | Borimnejad, L., Salmanyazdi, N., Haghani, H. |

Effects of Communication Skills Training on Aggression and Quality of Life of Male Patients with Chronic Mental Illnesses



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ABSTRACT

Background: Chronic mental illnesses affect cognitive status and behavior, which lead to social and communication impairment and behavioral problems. This research investigated the influence of communication skills training on aggression and quality of life of the patients with chronic mental illnesses.

Methods: This study is a quasi-experimental study with pretest and posttest. First, a total of 30 patients with chronic mental illnesses were selected based on the inclusion criteria. Next, they were randomly assigned into the control and experimental groups. The experimental group received techniques of communication skills for 10 sessions (each session 60 minutes, one session per week). The research instruments were The World Health Organization Quality of Life and Buss-Perry Aggression Questionnaire. Statistical analysis was conducted through analysis of covariance (ANCOVA).

Results: Our findings indicated that the means of quality of life scores ($F=41.62$, $P=0.001$) and aggression ($F=11.30$, $P=0.002$) were significantly different between research groups after the intervention.

Conclusion: Communication skills training improve behavioral problems and quality of life in patients with chronic mental illnesses. Thus, it is necessary to use these skills to prevent and decrease behavioral problems and promote social skills in patients with mental disorders.

1. Background

Many studies have reported that patients who diagnosed with psychotic disorders such as major depression (Dumais

et al. 2005), schizophrenia, schizoaffective disorder (Nederlof et al. 2013; Nolan et al. 2005), and bipolar disorder (Ballester et al. 2012) are engaged in violent behaviors more than healthy population. In general, aggression is an inclination towards attack, menace, and struggle in agitating situations (Ružić et al. 2008). However, the most

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victims of aggressive behavior of inpatients in psychiatric department are medical staff (Zieřt et al. 1980; Anderson & West 2001). Different factors are involved in increasing the risk of showing violent behavior, including illness-related factors (severity of psychotic symptoms and the type of disorder) (Winsper et al. 2013), personality characteristics (Barlett & Anderson 2012), environmental variables (Simons et al. 2011), lack of insight, and impulsive behavior (Krakowski 2003).

Some recent studies on the increased incidence of aggression in patients with psychotic disorder highlighted the role of environmental factors and poor communication skills (Gerdtz et al. 2013; Pulsford et al. 2013). However, other studies on aggression among mental illness patients indicated that aggression was a determinant factor for psychiatrists to diagnose mental disorders (Chan & Chow 2014; Singh et al. 2012). On the other hand, stigma towards mental diseases leads to increase in anxiety, withdrawal, and deterioration in social performance. Thus, all these factors would result in increase in aggressive behavior in patients with mental diseases (Fresan et al. 2009).

Patients with mental disorders have impaired cognition and behavior that ends in problems with interpersonal skills (Yoon et al. 2008). Onset of chronic mental diseases in early age prevents affected individuals from learning social skills (Vakilian & Jashem Abadi 2008). Patients diagnosed with schizophrenia behave poorly in communication and interpersonal skills, especially in collaboration, adjustment, and centralization compared to patients with other mental disorders (schizoaffective, paranoid schizophrenia, and psychosis). In addition, information exchange process in psychotic men is poorer than relations with others (Moore et al. 2012).

Social skills impairment becomes stable over time in the absence of psychological interventions, and it gets resistant to medical treatment (Sadock & Sadock 2012; Dimatteo et al. 2002). Although, it seems that mental illness responds to medical treatment, a large proportion of these patients experience psychological symptoms that result in downgrading their life quality. In order to understand the causes of aggressiveness in mental illnesses, other factors such as quality of life (Strous et al. 2009), personality traits, and family functions (Abbasi et al. 2009) should be considered. Quality of life is an individual's perception of his or her position in life in the context of the culture, beliefs, and expectations (Kalatehjari et al. 2007).

Functional cognition is an index of independent function of life and job that is influenced by mental illness (Fagiolinia & Goraccib 2007). Researchers in this area have

shown the relationship between positive and negative psychotic symptoms and physical function, independent life, and quality of life (Awad 1997; Mohr 2007). They have also investigated that quality of life reduce the hospitalization time (Saarini et al. 2007; Hofhuis et al. 2008). However, individuals who learn communication skills display lower degrees of aggression (Vyskocilova & Prasko 2012).

A meta-analysis research indicated that social skills training can improve social skills of the patients with chronic psychosis and can reduce their psychiatric symptoms (Yousefi & Ghorbanalipour 2009; Kurtz & Mueser 2008). This intervention is useful for the patients with psychological disorders that have interpersonal problems such as difficulty in establishing new relationships, responding to critiques, declining offers, expressing their feelings, having close friends, marital relations, and so on. (Nolan et al. 2005).

This method is an appropriate intervention for a range of psychiatric disorders like bipolar disorder (Goldstein et al. 2008), schizophrenia (Roder et al. 2002), anxiety disorder (Herbert et al. 2005), and substance abuse (Botvin & Wills 1985). Social skills was defined as a typical strategy that individuals use to perform effectively their social responsibility (Kravits et al. 2010). In other words, social skills are individuals' abilities in response to environment that lead to generate, maintain, and increase their positive influence in interpersonal relationships (Leberton & Tuma 2006).

Social skills training include behavioral, cognitive, perceptual, and emotional skills. It encompasses 3 components; 1) Social perception (detection of nonverbal and verbal stimuli), 2) Social cognition (analyzing the social stimulus), and 3) Behavioral response (generate effective verbal, nonverbal, and paralinguistic responses) (Drake & Bellack 2005). Behavioral factors of social skills are abilities to have healthy interaction with others, as well as flexibility and self-adjustment with environment. Based on the concept of social skills, optimal social behavior requires individual's ability to understand the situation and integrate with certain behaviors (3 components) that have effective and positive results in the concrete social situation (Vyskocilova & Prasko 2012; Deniz et al. 2009).

Social skills can help patients with psychosis to manage stressful events, solve problems and challenges, and improve medication adherence and psychological intervention (Kopelowica et al. 2006; Kern et al. 2009; Patterson et al. 2005).

On the other hand, in recent years, researchers emphasize that low quality of life in patients with schizophrenia plays an important role in aggravating symptoms of

psychosis (Ritsner & Gibel 2006). Therefore, maintaining and developing quality of life is necessary and should be considered in intervention therapeutic programs. In this regard, several studies have been performed on the relationship of chronically mental illness symptoms with other disorders. However, there is a gap in the study of training programs with regard to decrease in negative and positive symptoms of the chronically mental illnesses. Therefore, the current study aimed to investigate the influence of communication skills on improving the quality of life and decreasing aggression in male patients with chronic mental illnesses.

2. Materials & Methods

The present study is a quasi-experimental research with pretest-posttest design and follow up. First, study patients were selected through convenience sampling method according to inclusion criteria out of patients referred to Lavasani Hospital from July 2014 to December 2014. Then, they completed Buss-Perry Aggression Questionnaire (BPAQ) and The World Health Organization Quality of Life (WHOQOL)-BREF. To respect the rights of the participants, some information was provided about the performance of the program and the researcher emphasized on the principle of the confidentiality of personal information. Informed consent forms were obtained from

participants' parents or guardians before the actual training. The inclusion criteria were as follow: not showing any severe or pervasive cognitive impairment, having obvious psychotic symptoms, and recovery period between two hospitalizations and consciousness problem, having healthy orientation, demonstrating a minimum of IQ score of 90, and having high school diploma.

Exclusion criteria were as follows: showing impaired judgment, impaired orientation, low level of education, lack of parental or guardian consent, delusions and hallucinations, mental retardation, personality disorder, and using anti-aggressive drugs.

Finally, 30 patients who took the optimal cutoff score (78) for diagnosing aggression were selected. They were randomly assigned into the experimental (intervention) group and control group.

The intervention group received communication skills trainings (Table 1) in 10 sessions (1 hour for each session per week), but the control group did not receive any intervention. The researcher followed the standardized procedures and techniques of the training program to the letter. To minimize the environmental differences between the intervention and control groups, the same person instructed both groups and the sessions were held in the same place. Part of each

Table 1. Contents of communication skills training.

Sessions	Sessions objectives
First session	Initial introduction, briefly explain the objectives of the sessions, Homework: focusing on the relationship with others
Second session	Improving an effective relationship, preparation and termination of a relationship, identifying personality characteristics
Third session	Non-verbal communication, identifying environment factors
Forth session	Effective conversation, barriers to effective listening
Fifth session	Learning reflecting and feeling in relationships, fostering empathy, identifying different responses
Sixth session	Modes of communication in society, identifying the benefits of self-disclosure
Seventh session	Learning coping strategy in different relationships, growing power to say no
Eighth session	Awareness of the advantages and disadvantages of conflict, distinguishing between conflicts, managing individuals or groups conflicts
Ninth session	Implementable model of cooperative problem solving, coping with problems
Tenth session	Learning structure of love mode and its influence in relationships

session was devoted to reviewing the content, topics, and assignments from the previous session. At the end of each session, the assignments were given for the next therapy session. After the intervention sessions, the posttest was taken from the intervention and control groups. Also, 1 month after study completion, the therapeutic effects in both groups were assessed with the same questionnaire.

WHOQOL was used to assess the quality of lives of study participants. This questionnaire is a short form of "World Health Organization Quality of Life" that was published by WHO in 1991. It comprises 24 items that measure physical and psychological health, environment, social relationships, general health, and apparent quality of life (Montazeri et al. 2005). Participants respond to items on a 5-point Likert-type scale. Its internal consistency reliability (The Cronbach α) was reported in the original study between 0.73 and 0.89. In the Persian study, the internal consistency reliabilities were as follows: total=0.88, physical health=0.70, mental health=0.77, social relationship=0.65, and environment quality=0.77 (Rahimi et al. 2006).

In order to assess aggression, we used BPAQ. It has 29 items (Buss & Perry 1992) and was prepared in 1992. The items are scored on a 5-point Likert-type scale. It includes 4 subscales of physical aggressive, verbal aggressive, aggression, and hostility. Its internal consistency reliabilities were as follows: physical aggressive=0.82, verbal aggressive=0.81, aggression=0.83, and hostility=0.80 (Montazeri et al. 2005). In its Persian version, the Cronbach α was reported as 0.89 (Mohammadi 2007). The collected data were analyzed through analysis of covariance by SPSS ver 20.

3. Results

Table 2 presents the sample characteristics of the participants in the study.

As shown in Table 2, most patients were diagnosed with schizophrenia (32.3%). The educational level of patients ranged from high school to bachelor's degree, and 51.6% of them had a diploma. In addition, the highest range of patients' age was 41 (19.4%). As shown in Table 3, the re-

Table 2. Demographic characteristic of patients in both research and control groups (n=15 in each group).

Mental disorder	^a n _i	^a P	Level of education	^a n _i	^a P
Schizophrenia	10	32.3	High school	12	38.7
Depression	8	25.8	Diploma	16	51.6
Bipolar	6	19.4	BA/BS	2	6.5
Schizoaffective	6	19.4	Total	30	100

Abbreviations: P: Relative frequency, n_i: Absolute frequency.

Client-Centered Nursing Care

Table 3. Results of covariance analysis of aggression and quality of life.

Variable	Group	^b SS	^b df	^b MS	F	P-value	^b R ²
Aggression	Pretest	3802.50	1	3802.50	19.13	0.001	0.40
	Group	1363.26	1	1363.26	11.30	0.002	0.28
	Error	5564.22	28	198.72	-	-	-
Quality of life	Pretest	4927.900	1	4927.900	50.85	0.001	0.64
	Group	3850	1	3850	41.62	0.001	0.60
	Error	2737.82	28	97.79	-	-	-

Client-Centered Nursing Care

^b Abbreviations: SD: Standard Deviation, df: Degree of Freedom, SS: Sum of Square, MS: Means of Square, R²: Partial Eta Square.

* P<0.05.

sults indicate that the influence of communication skills training is statistically significant in the scores of aggression posttest scores (partial eta squared=0.28). Therefore, there is a significant difference between a pair of means ($F=11.30$, $df=1$, $P=0.002$). Furthermore, there is a significant difference between pretest and posttest results of quality of life scores ($F=41.62$, $df=1$, $P=0.001$, $\eta^2=0.64$).

4. Discussion

The current study was performed to investigate the influence of communication skills in aggression and quality of life in male chronically mental ill patients. The findings indicated that communication skills play a critical role in decreasing the aggression and increasing quality of the patients' lives. These results are consistent with previous studies results (Rodriguez et al. 2015; Mazurek et al. 2013; Dahuji & Tarakkoli 2014; Fukui et al. 2011; Curtis et al. 2013). In general, chronically mentally ill patients have problems in communication with others. In other words, chronically mentally ill patients have demanding of quality of life (Khodabakhshi Koolae et al. 2014).

Social skills training has influence on the promotion of self-care in chronically ill patients (Koujalgi et al. 2014). Durand and Merges (2001) found out that functional communication training improves effective relationship with others and reduces behavioral problems, especially aggression. However, there is a negative relationship between aggression and communication skills as well as self-disclosure (Herrenkohl et al. 2007). Lack of communication skills causes other disabilities. It is worth mentioning that mental illness, especially chronically mental illness creates critical problems which ends in patient's isolation (Hematimansh et al. 2012). The recent research performed on social skills training to stabilize outpatients with schizophrenia indicated that social skills training improved psychopathology, social discomfort, social cognition, social withdrawal, interpersonal communication, and quality of life compared with the treatment-as-usual (Rus-Calafell et al. 2013).

Furthermore, teaching cognitive behavioral social skills to older patients with schizophrenia improved their dysfunctional behavior such as lack of motivation, depression, anxiety, negative self-esteem, and life dissatisfaction (Granholm et al. 2013). In addition, social skill training had a remarkable effect on improving adaptive functioning and decreasing negative symptoms such as apathy and anhedonia (Kurtz & Mueser 2008; Koujalgi et al. 2014; Avery et al. 2009). In this regard, previous research showed that communication skills training in dementia care promoted the quality of lives in patients with demen-

tia and increased their positive interactions in different situations (Eggenberger et al. 2013). Based on the findings of the present and previous studies, it can be argued that the status of communication skills in chronically mentally ill patients is related to their quality of lives. In other words, self-confidence, skills, and abilities of these patients in communication and communal living skills improve their daily living capacity and enhance their quality of lives (Khodabakhshi Koolae et al. 2014)).

Thus, we suggested that communication skills be taught to mentally ill patients to improve their behaviors. In addition, it is recommended that future studies be conducted with longer follow up periods, and also determine the other factors, which were influenced by communication skills training. However, the limitations of this study which restricts its generalization relates to first using only male subjects in this research and second, the few number of studied mental disorders that were confined to schizophrenia, depression, bipolar, and schizoaffective disorders.

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Conflict of Interests

The authors declared no conflict of interests.

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Effects of Reflexology on Sleep Quality of Elderly Women Undergoing Abdominal Surgery



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ABSTRACT

Background: Sleep disorder is one of most prevalent complaints in elderly people. Tension reduction can be effective in improving sleep quality. In this regard, reflexology can be effective in reducing anxiety and tension. This study aimed to determine reflexology effects on sleep disorders of elderly women undergoing abdominal surgery.

Methods: This study was a non-randomized clinical trial (quasi-experimental). A total of 80 elderly women undergoing abdominal surgery were selected by continuous sampling method and simple random selection of two hospitals (Hazrat-e-Rasool [PBUH] and Firouzgar). Then, they were assigned in experimental and control groups. The study instrument was sleep quality questionnaire (PSQI). Descriptive statistics included calculating mean and standard deviation and inferential statistics were performed through the independent t-test and paired t-test.

Results: There was no significant difference in terms of quality of sleep ($P=0.504$) between control and experimental groups, before the intervention. Also, There was no significant difference between means of quality of sleep scores ($P=0.606$) before and after the intervention in the control group. However, there was a significant difference between the means of quality of sleep scores ($P=0.048$) before and after the intervention in the experimental group. Finally, the means of quality of sleep scores of two groups after the intervention was significantly different ($P<0.001$).

Conclusion: Considering the significant effect of reflexology on improving the quality of sleep in elderly women undergoing surgery, it is recommended that this simple technique (which is available and low-cost as an alternative medicine) be used in reducing the postoperative pain and improving the quality of sleep of patients.

Keywords:

Elderly, Reflexology,
Sleep disorder

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1. Background

Sleep disorder, with an incidence of 9% to 15% in the general population worldwide, is one of the most common complaints of the patients (Ohayon et al. 2004). Sleep disorders may lead to fatigue, impaired daytime functioning, irritability, depression and anxiety disorders (Taylor et al. 2003).

According to Nobahar and Vafayi (2007), the incidence of dyssomnia in the elderly was about 67%, and 61% of them suffer mostly (28.5%) from (primary, alternate, and final) insomnia. The incidence of parasomnia was 29% and it was mostly in the form of having nightmares. With regard to treating methods, behavioral therapy is used by 57% of cases, mostly (25%) by focusing on body organs before sleep. About 95.5% of the patients were familiar with cognitive methods mostly (26%) about the effects of the age on sleeping. Also, 100% were aware of the sleep hygiene, and most of them (39%) were at least familiar with the effects of 4 hygienic items on sleeping, and finally 20% took drugs (Nobahar & Vafaei 2007).

Although sleep patterns change during the lifetime, sleep problems are usually associated with chronic medical problems which are more common in the elderly. Sleep problems can lead to deterioration in focus, slowed reaction, and memory impairments, which is subsequently likely to increase the probability of stumbling and slipping and bring up the problem of falling in the elderly during the changes in the environmental conditions or during their short way to use toilet (Ancoli-Israel et al. 2003).

In this regard, some studies like Helbig et al. (2013) study about the relationship between insomnia and falls in the elderly emphasized that sleep disorders may lead to their fall. In 2014, Arašteh et al. studied the sleeping quality in the hospitalized patients and showed that generally the quality of sleeping in 26.7% of the hospitalized patients was desirable and in 73.3% undesirable, and being in the hospital was one of the most effective factors in the sleep disorders of these patients. Because on one hand, being in the hospital causes anxiety and stress, separation from family, and change in the sleeping place and the probability of the having pain on the other hand all affect sleeping and its conditions. Another important finding in this study was the relation of quality of sleep with the patients' gender, so that men had a more desirable and better sleeping quality than women (Arašteh et al. 2014).

Other studies had emphasized the relationship of the gender with the sleeping quality. For example, Kinja et

al. (2004) claimed gender as one of the most effective factors on sleeping disorders and it was of more importance in elderly women since it was significantly related to the hormonal changes in menopause (Kravitz et al. 2008).

Operation is one of the factors which can cause post-operative pain and sleeping disorders. In this regard, one of the ways to improve the quality of sleeping is using sleeping pills. However, medications may have adverse effects in the elderly, including drowsiness, cognitive dysfunction, transient amnesia, falling, and loss of mental functioning although an undeniable improvement is seen in the adequate use of these drugs (Bloom et al. 2009). Despite continuous advancement and improvements in pharmacologic and non-pharmacologic treatments of insomnia, using alternative medicine with conventional medication is common. A survey in America had shown that 4.5% of the elderly reported that they have used a complementary or an alternative medication for the treatment of their insomnia or sleep disorder in the past year (Lee et al. 2011).

In a review study by Yang et al. on the effects of acupuncture, reflexology, and ear acupuncture on people with insomnia (not necessarily the elderly), it was found that reflexology, as an effective treatment of insomnia, compared to the different psychological cares such as counseling, relaxation training, sleep hygiene education, lifestyle changes, and the use of some sleep-aid drugs, has always been considered in some groups (Yeung 2012). Reflexology is a complementary therapy with no side effects and its learning and applying is easy. A little knowledge is necessary for its application and it gained popularity among the general population (Yang 2005). In a study by Li et al. on the effects of the reflexology on exhaustion, sleeping, and pain, it was shown that reflexology is one of the interventions that could be effective on the reduction of sleeping disorders, exhaustion, and patients' pain (not necessarily the elderly). Furthermore, some other studies emphasized on performing more research on the effects of the reflexology as a nursing intervention on the variable outcomes of exhaustion, sleeping, and pain (Lee et al. 2011).

With regard to few studies conducted on the effects of non-pharmacological interventions such as reflexology on the sleep quality of the elderly hospitalized patients, several and sometimes irrecoverable and threatening complications of sleep disorders such as falling in the older people, the positive effectiveness of reflexology as a non-pharmacological approach with affordable nursing intervention, and also according to the results of a recent systematic review (Song et al. 2015) indicating the need

for further and more accurate studies on reflexology (foot massage) management of symptoms (such as sleep disorders) in different people, this study aimed to determine the effects of reflexology (foot massage) on sleep disorders in female elderly patients undergoing abdominal surgery.

2. Materials & Methods

This research is quasi-experimental with pretest, post-test and control group, and in terms of purpose, is an applied study. The samples were chosen from the Hazrat-e-Rasol (PBUH) and Firoozgar (Operation Ward) hospitals.

Study participants

A total of 80 elderly women undergoing abdominal surgery were selected based on the sleep quality questionnaire by purposive sampling method among all older women undergoing abdominal surgery in 2015. Then, they were randomly assigned into two groups of control and experimental (each group 40 subjects).

The inclusion criteria were as follows:

- Undergoing abdominal surgery;
- Having trouble in sleeping;
- Absence of disease or foot deformity (corns, burning feet, amputations, or skin diseases);
- No history of drug use or mental disorders;
- The ability to self-report the pain.

The exclusion criteria were as follows:

- Lack of cooperation or death of the elderly subject;
- Not wanting to continue to participate in the study;
- Having any malignancy associated with surgery;
- Need for hospitalization in intensive care unit.

Study instrument

Pittsburg sleep quality index (PSQI) is a questionnaire designed to examine the sleeping disorder. This questionnaire has 7 components as follows:

- A general description of the quality of sleep;
- Sleep latency;
- Actual sleep duration;

- Sleep efficiency (actual sleep duration based on the ratio of the total time spent in bed);
- Sleep disturbances (awaking at night);
- The amount of consumed sleeping pills (dose);
- Daily functioning (individual experienced problems due to lack of sleep during the day).

The total score ranges from 0 to 21. The questionnaire had a sensitivity of 90% and specificity of 87%. Buysse and colleagues (Buysse et al. 1989) who designed the questionnaire calculated its internal consistency as 0.83 by using the Cronbach α . In Iranian version of the questionnaire, the validity and reliability were 0.89 and 0.86, respectively (Heidari et al. 2010). In 2013, Beirami and colleagues used this questionnaire in their research on sleep disorders in older adults in which the test-retest reliability of the survey was reported between 0.93 and 0.98 (Beyrami et al. 2014).

Study procedure

The research is registered with the code No. IRCT2016010325625N2 at the clinical trial center. The researcher started sampling after getting the permission of the Ethics Committee of Iran University of Medical Sciences and the written introduction letter from the authorities of Nursing School as well as the informed consents of the patients who met the study inclusion criteria. After selecting the samples, they were placed in 2 groups. The control group did not receive any special treatments.

However, the experimental group received the reflexology intervention twice a day (20 minutes each time), one in the morning (an hour after breakfast) and one at night (an hour before sleeping) in the second and third day after the operation. The pretest was performed half an hour before the intervention on the second day of the post operation and posttest one day after finishing the intervention. Descriptive and inferential data analysis was conducted using mean, standard deviation, paired t-test and the Independent t-test.

3. Results

The main hypothesis of this research was “study of effects of reflexology on sleep quality of elderly women undergoing abdominal surgery” which in turn can be separated into three minor ones.

- The sleeping quality of older women undergoing surgery in the experimental group was different before and after the intervention (Table 1);

- The sleeping quality of older women undergoing surgery in the control group was different before and after intervention (Table 2);
- The sleeping quality of older women undergoing surgery in the control and experimental group was different before and after the intervention (Tables 3 and 4).

In the continuation, the study hypotheses are examined by statistical tests.

Hypothesis 1

The means and the standard deviations of the sleeping quality scores of the elderly women undergoing surgery in the experimental group were different before and after the intervention.

The results of the paired t-test are presented in Table 1. It shows that the mean sleeping quality scores had a significant difference (increase) before and after the intervention in the experimental group and after the intervention (P-value=0.048).

Hypothesis 2

The means and the standard deviations of the sleeping quality scores of the elderly women undergoing surgery in the control group were different before and after treatment. According to Table 2, the sleeping quality scores in the elderly women undergoing surgery in the control group did not show a significant difference before and after the intervention and remained unchanged (P-value=0.606).

Hypothesis 3

Numerical indices of sleep quality scores in the elderly women undergoing surgery in experimental and control groups were different before and after the intervention.

Before the intervention

Table 3 compares the difference of means of sleeping quality scores between the control and experimental groups before the intervention. Based on the Independent T-test results in Table 3, two groups did not show a significant difference in the sleeping quality before the intervention (P-value=0.504).

Table 1. The means and standard deviations of sleeping quality scores of elderly women in the experimental group before and after the intervention and its significant test.

Sleeping quality scores before the intervention		Sleeping quality scores after the intervention		Paired t-test
Mean	SD	Mean	SD	
16.10	2.85	17.33	1.81	t=1.54, df=39 P-value=0.048

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Table 2. The means and standard deviations of the sleeping quality scores of the elderly women in the control group before and after the intervention and its significant test.

Sleeping quality score after the intervention		Sleeping quality score before the intervention		Paired t-test
SD	Mean	SD	Mean	
2.88	15.29	3.37	15.63	t=0.521, df=39 P-value=0.606

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Table 3. The means and standard deviations of the sleeping quality scores of the elderly women in the control and experimental groups before the intervention and its significant test.

Sleeping quality score in the experimental group		Sleeping quality score in the control group		Independent t-test
SD	Mean	SD	Mean	
2.85	16.10	3.37	15.63	t=0.671, df=78, P-value=0.504

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Table 4. The means and standard deviations of the sleeping quality scores of the elderly women in the control and experimental group after the intervention and its significant test.

Sleeping quality score in the experimental group		Sleeping quality score in the control group		Independent t-test
SD	Mean	SD	Mean	
1.81	17.33	2.88	15.29	t=3.80, df=78, P-value<0.001

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After the intervention

Table 4 compares the difference in the sleeping quality scores after in the intervention between the control and experimental groups.

As it can be seen in Table 4, the control and experimental groups had a significant difference with regard to the mean of the sleeping quality scores after the intervention (P-value<0.001). Because the mean sleeping score of the experimental group was higher than the control group, and the higher score means better sleeping quality, it can be said that reflexology was effective in the improvement of the sleeping quality in the elderly women undergoing surgery.

4. Discussion

This study aimed at examining the effects of reflexology on sleeping quality of the elderly women undergoing abdominal surgery. The research results showed that reflexology was effective on improving the sleep quality of these patients.

The results of this research are consistent with the results of Boitor et al. (2015) study. They studied the effect of palm massage (reflexology) on postoperative pain in adults hospitalized in the intensive care unit. The intervention (palm massage) was performed on patients 2 to 3 times per day, each time 15 minutes. The results showed that after the second and third session of the massage, the patients' pain had significantly reduced. The main findings of this study showed that palm massage (reflexology) could alleviate postoperative pain caused by incision in cardiac surgery.

The results of this study are consistent with the results of Babajani et al. (2014) study entitled "the effects of the reflexology on the level of the pain during chest tube removal after coronary artery bypass graft".

The results showed that foot massage at the reflection spot of the chest is effective on reducing pain due to the removal of the chest tube. Foot reflexology massage is an effective nursing intervention in dragging chest tube after open heart surgery. In another research, Ashcandy et al. (2014) examined the effects of reflexology on the

sleeping quality in the ischemic patients hospitalized in CCU in a clinical trial. Reflexology treatment was conducted on the experimental group for two nights each time for 20 minutes in succession (each foot 10 minutes).

The results showed that reflexology, as an easy, low-cost, and without adverse effects, is effective in the treatment of the insomnia in hospitalized patients with ischemic heart disease. Hashemi et al. (2012) in their experimental and applied study examined the effects of the reflexology on the foot sole in reducing backache caused by discopathy in 30 men suffering from backache. Reflexology was conducted on the subjects on alternate days (each time for 30 minutes) for one month. The results showed that the backache caused by discopathy can be reduced through foot sole massage.

Merdacy et al. (2013) conducted a study entitled "the effects of the foot massage on the mothers' sleeping disorders in post-delivery". This clinical study was conducted on 60 nulliparous mothers referring to the health centers of Khorramshahr City, Iran in 2013. The results showed that foot massage was effective on the improvement of the mothers' sleeping disorders and pain relief. The elderly, especially women experience a high level of anxiety (Segal et al. 2008).

Regarding that the elderly women, in this study, underwent an abdominal surgery, their level of the anxiety was high. One of the main causes of insomnia is anxiety (McGowan et al. 2016). Low sleeping quality in the elderly women undergoing surgery can be caused by their anxiety. Postoperative pain also affects this sleeplessness and intensifies it. In addition, it increases anxiety and aggravates pain feeling in the patients (Welch-McCaffery 1985). Therefore, insomnia will increase. Foot massage, easing muscle tension, relaxing muscles, and creating a sense of comfort in the patients, reduce the pain and relax the patient and will eventually decrease patient's anxiety (Dashtbozorgi et al. 2012; Hernandez-Reif et al. 2004; Krohn et al. 2011; Quattrin et al. 2006). On the other hand, foot massage reduces the level of catecholamines (epinephrine and norepinephrine), which play some role

in creating the anxiety (Dashtbozorgi et al. 2012; Field et al. 2005). Also foot massage increases the secretion of hormones like dopamine and serotonin, which their main role is creating euphoria and happiness in people, and consequently decreases the patients' anxiety (Hernandez-Reif et al. 2004; Field et al. 2005; Field 2002). Suppressing the anxiety can directly affect and improve the sleeping quality (McGowan et al. 2016).

The results of the present study verify the study hypotheses, and apparently reflexology is effective on the sleeping quality of the elderly in post abdominal surgery. Therefore with more research, reflexology, as an easy and safe non-pharmacological intervention, can be used to manage the sleeping problems (in the elderly) and postoperative problems, especially since it can be done very easily by a nurse or other people at home or elderly care homes. Therefore, based on the findings of this study, it is recommended that non-pharmacological methods of improving sleeping quality like reflexology be included in the geriatric health programs.

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Conflict of Interests

The authors declared no conflict of interests.

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Exploring the Challenge of Adoption from the Perspective of Iranian Infertile Women



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ABSTRACT

Background: Adopting another person's child by infertile couple might not alleviate their pain so much but direct the suffering and pain of infertility towards parenthood and parental experience. Therefore, this study aimed to explore the challenges of adoption to assist in proper planning to improve the quality of adoption.

Methods: This qualitative study was conducted with conventional content analysis method on 25 women with primary and secondary infertility. The study was conducted in Vali-e-asr Reproductive Health Research Center, Tehran, Iran. Sampling method was done purposefully and data were gathered from semi-structured interviews. The interviews continued until saturation of the data. Concurrent with data collection, their analysis was done based on the conventional content analysis method.

Results: The main concepts derived from data were categorized into 3 main themes and their subthemes as follows: 1) Legal and cultural barriers (importance of blood ties, priority of treatment before deciding to adopt a child, and strict legal requirements), 2) The attitude of the husband towards adopted child (adoption as a good deed, husband preferred to continue the treatment as much as possible, the decision of the husband depends on the reaction of others around them, and preferring remarriage over adoption), 3) Attitude of the others (fear of disclosure of adoption in the future and negative attitudes of the society).

Conclusion: The findings of this study showed that in our society, the importance of blood ties, cultural factors, and infertility treatment are among the barriers to adoption. The results show that it is critical to raise the awareness and enlightenment in society through the media to minimize the socio-cultural consequences of adoption.

Keywords:

Infertility, Adoption, Qualitative study

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1. Background

Infertility as a life crisis, accompanies with a vast range of social, psychological, physical, and financial problems (Avidime et al. 2013; Greil et al. 2010). More than 80 million people worldwide are infertile. Infertility rates are different across the countries from less than 5% to more than 30% (Daar & Merali 2002). In Iran, in a comprehensive study which was conducted to determine the prevalence of infertility in 2005, it was found that 24.9% of the couples had experienced primary infertility during their married life (Vahidi et al. 2009). Although infertility is not a disease, its impact on all aspects of a person's life can cause mental, social, and emotional disorders (Hasanpoor-Azghdy et al. 2015).

Despite the huge progress in the diagnosis and treatment of infertility and the great efforts usually done by the couples to have a baby, even in the best equipped health centers, some infertile couples do not succeed to have a child. High failure rate of these approaches cast doubts on using them. Furthermore, infertility treatments are too expensive and not all families afford them or can access them (Yassini et al. 2012; Ezenwankwo et al. 2014; Joshi et al. 2015; Ojelabi et al. 2015).

Also, some infertile couples may be reluctant to get pregnant by using complicated and invasive technologies, so they can experience parenthood through adoption (Ismaili 2004; Aliakbari & Tavakol 2010). Adoption is among the most important strategies in dealing with the negative consequences of infertility and it can help cure the damaged mental aspects of infertile couples and improve relations between spouses. Also couples feel the joy of parenting and resolve mental health problems caused by lack of child in their lives (Abubakar et al. 2013; Joshi et al. 2015). However, adoption has been neglected and considered an obsolete method. There are different attitudes toward adoption; some of them are extremely negative (Bagheri et al. 2009).

Adoption is a legal relationship formed by adopting a child by a man and woman who are not his or her biological parents (Nguefack et al. 2014). For most infertile couples, decisions on the adoption or use of third party reproductive technology (For example, egg donation, embryo, etc.) are not made easily and fast. During the preliminary medical treatments, once couples are hopeful towards success of the treatment, adoption creates great concern. This is the fear they don't want to face during the quest for having a biological child (Razzaghi 2006). Qualitative research findings in Iran also showed that the challenge of adoption is the

dilemma that made respondents face with serious tensions. Interest or disinterest in adopting a child, insistence or opposition of the husband to adopt a child, intervention of the couple's families, and so on were among serious concerns of infertile women. The child's unknown family tree and reaction of relatives and acquaintances to the newcomer baby were among the issues that made the couples hesitant in adopting a child. Most of infertile women oppose to adopt a child and mention emotional issues, social problems, people's words, and appearance of adopted child's parents as the causes of their disagreements (Abbasi-Shavazi et al. 2005; Fahami et al. 2010; Bokaie et al. 2012).

The results of Avidime et al. (2013) study showed that 42.6% of all participants would like to adopt a child, if there was no solution to their infertility. In a study in Cameroon, 84.8% of the subjects were aware of the adoption and attitude of 76.7% of them was good towards adoption; however, only 1% had adopted a child at the time of the study which was due to their enthusiasm towards having a child (Nguefack et al. 2014). In a study by Yassini et al. (2012), only 4.5% of infertile couples had an adopted child at the time of study. Most infertile couples have some constraints on adoption, so the first and most important step to assist these couples is to identify their challenges with regard to adoption. Without real knowledge of the factors affecting adoption, it is not possible to support and help these couples.

The cultural reasons that impede adoption were seen in all studies done in developing countries (the studies that we had access to them) (Adewunmi et al. 2012; Bokaie et al. 2012; Nguefack et al. 2014; Joshi et al. 2015). Also, studies have shown that investigating the various aspects of infertility is incomplete and futile, without paying attention to the socio-cultural context of the society in which the infertile person lives. Because the cultural context is very important in shaping infertility life experiences (Gannon et al. 2004; Inhorn 2008; Greil et al. 2010), this qualitative study explored the challenge of adoption to help prepare proper planning to improve the quality of adoption process based on deep understanding of these challenges.

2. Materials & Methods

To explain the perception of infertile women in their assessment of adoption, a qualitative approach was used with the conventional content analysis method. In this research, the study population consisted of infertile women with primary and secondary infertility. Participants with secondary infertility had no pregnancy that led to a live birth. The study setting was Vali-e-Asr Reproductive Health Research Center, Tehran, Iran, which infertile women from

different parts of the country get acquainted with it by the medical staff, acquaintances, or infertile partners.

Sampling was purposively done with the maximum diversity and range which could further contribute to the generalization of the findings (Polit & Beck 2006). The participants were selected with different ages, duration of marriage, duration of infertility, types of treatment, duration of treatment, educations, occupations, living in urban and rural areas, and incomes. These difference added to the reliability of the obtained data. Inclusion criteria for participants consisted of having primary or secondary infertility due to just gynecological causes, not having a living child (in women with secondary infertility), not adopting a child, not having chronic diseases or mental illnesses, and willing to participate in the study.

After approval of the Ethics Committee of Shahid Beheshti University of Medical Sciences and presenting the introduction letter to research center, The researcher explained to the participants the study purpose, reason for choosing infertile women for the study, their role in the study, advantages of their participation in the research, confidentiality of their information, their right to participate or decline the research and how to contact the researcher. Then, after the participants agreed to take part in the study, their informed written consents were taken.

To select information-rich participants who can actively take part in the study, the researcher followed this procedure. In the morning and before the interviews, the researcher reviewed files of all participants supposed to be visited on the day and chose some of them who met the inclusion criteria. Then, the researcher checked out the behavior and manner of the selected women through talking with the physician and midwives of the ward and during the examination. This procedure, along with the guidance of medical staff (with regard to their frequent contacts with infertile women), were helpful in choosing information-rich participants who can provide their experiences to the researcher.

To collect data, semi-structured individual interviews, observation, field notes, and files of patients were used. The interviews were done in a room located on the second floor of Infertility Center which was quiet and completely at the researcher's disposal. After participants' agreements, the recorder was turned on and interview began (using an interview guide form) with this question:

“Did you ever think about the issue of adoption or if there was a conversation between you and your husband about this issue?”

During the interview, the nonverbal behaviors of participants were paid attention to. For each participant, an interview was conducted for 60 to 90 minutes. Interviews continued until the data saturation which occurred with the 23rd participant. To be on the safe side, two more women were interviewed and the number of interviews reached 25. After each interview, the information which was recorded with the permission of participants were transcribed word by word in the shortest possible time and after 2 to 3 times of listening to the records. Finally, they were typed. Along with the process of data collection, their analysis was performed, too (Polit & Beck 2006).

Observation of reactions and conversations of infertile people with others was done in different sections of the Infertility Center such as the waiting room, the admission office, examination room, sonography room, and diagnosis procedure room, but the researchers did not notice any situation in which the women talked about adoption with each other or the medical staff to have field note in this regard.

To analyze the data, conventional content analysis method was used. Qualitative content analysis is a research method used for mental interpretation of written data content. In this method, during the process of systematic classification, codes and themes are identified out of the views of study participants. Then, the codes, which are extracted based on the units of meaning drawn from participants' descriptions, are classified with regard to their differences or similarities and their themes are identified (Spannagel et al. 2005). In this way, the interview transcripts were reviewed several times to get completely familiar with their contents, then the codes were extracted based on the units of meaning drawn from participants' descriptions and classified with regard to their differences or similarities and finally the related themes were identified.

To be ensured of the data credibility, different techniques such as diversity of participants, long-term exposure to participants and research setting, providing information about the study objectives, continuous evaluation of the data, sound recording and transcription, data analysis immediately after the interview, and using its feedback for the next interview, were used. Moreover, the obtained data were verified and revised through review by a number of study participants and independent experts. To check transferability of the study, the data were presented to some infertile women who did not participate in the research and were asked to compare the results with their own experiences (Polit & Beck 2006).

3. Results

Analysis of the data drawn from the interviews and field observations led to the formation of 3 main themes and their subthemes, which are shown in Table 1.

Cultural and legal barriers

This theme includes the following 3 subthemes: the importance of blood ties between the child and parents; priority of treatment before deciding to adopt a child, and strict legal terms.

Perception and experience of the participants indicated that blood ties between the child and parents are of great importance for some of them. These women believed that when the child is not from their blood and flesh, she or he will leave them in adulthood or his or her real parents might take him or her back. Others believed that they try hard to raise a child who is from other parents.

“It is of no worth to raise that child, I’d like to be his/her real mother, when I do not have a sense of motherhood, how can I be kind towards that child... when you gave birth to a child that was kick in ‘in your stomach, It’s a good and different feeling. I like the kid to be mine and of my own blood.”

(30 years old woman, diploma, housewife, 7 years of infertility)

Most of these women wanted to have a biological child, believing that a mother can only express genuine and sufficient affection to her biological child, because adopted child is not form their blood.

“I do not accept that child as my own, perhaps I show kindness towards his/her but that kindness, you are a woman as well, is not by heart.”

(31 years old lady, BA, translator, 2 years of infertility)

The duration and type of treatment are the other determining factors for some infertile women to think about the adoption. Some participants said that as the duration of their infertility period was short or they have not completed treatment yet, they would not think about adoption.

“No way, because our period of infertility is not so long, it is two and a half years now. For example, we say to a lady who has no child for 13 years that go and adopt a child, but she is also hopeful to IVF. We did not think like this, because my tubes were treated soon, they got opened and I’m so hopeful that may God give me a baby soon.”

(27 years old woman, diploma, housewife, 2.5 years of infertility)

Some participants mentioned that as long as the doctors have hopes that they give birth to their own children, they will try any type of treatment, and after that they will think about adoption.

Some participants who have searched for information about adoption, mentioned that legal requirements for adoption in our country were very difficult, especially the financial terms that an infertile couple should afford to apply for adoption. These terms would not let them to do so.

“Even if someone wants to adopt a child, it is too difficult to do so. You must earn a good income. Now the government takes it so hard.... I surfed the Internet to see that what the requirements are to keep custody of a child, it was written that you must have enough money in your bank account. Your husband must never be addicted. You as mother should not be over 50 years old.”

(35 years old woman, diploma, housewife, 7 years of infertility)

Table 1. The main obtained themes and their subthemes.

Main themes	Subthemes
Legal and cultural barriers	The importance of blood ties Priority of treatment before deciding to adopt a child Strict legal terms and conditions
Attitude of the husband towards the adopted child	Adoption, a good deed Husband prefers to continue the treatment as much as possible The decision of the husband depends on the reaction of other persons around Preferring remarriage over adoption
Attitude of others	Fear of disclosure of adoption in the future Negative attitudes of the society

Attitude of the husband towards the adopted child

This theme includes 4 subthemes: child adoption as a good deed, preference of the husband to continue the treatment as long as possible, decision of the husband is dependent on the reactions of those people around, and preference of the husband to remarry rather than adopt a child.

Participants' experiences indicated that one of the major factors in making decision of infertile women to adopt a child is their husbands. Perception and experience of participants show different decisions made by their husbands with regard to adopting a child. Some men agree with adoption due to their beliefs that raising these children is a kind of good deed, but the majority of them disagree with it.

"My husband will probably agree. Because when it comes to this conversation, he agrees. He says if a family raise these children, it is a good deed. My husband is a philanthropist. I know he would agree."

(39 years old lady, BA, language teacher, 2 years of infertility)

"If I talk about adopting a child in front of my husband, he would leave me."

(28 years old woman, guidance school, housewife, 2 years of infertility)

For some participants, decision of some men about adoption depends on the reaction of those around.

"But I think if I talk to my husband about it, he looks the reaction of others around to accept it or not."

(25 years old woman, associate degree, nurse, 2 years of infertility)

Some participants expressed that their husbands preferred to remarry rather than adopt a child and others mentioned that their husband preferred to continue treatment as much as possible rather than adopt a child.

"My husband prefers to remarry 10 times rather than adopt a child."

(37 years old lady, diploma, secretary, 12 years of infertility)

"I talked a couple of times with my husband but he never said yes or no. My husband said: why you get hope-

less so soon. He said: let's continue treatment as long as possible. Let's see what will happen."

(30 years old woman, diploma, housewife, 2.5 years of infertility)

Attitudes of others

This theme includes two subthemes: fear of disclosure of adoption in the future and the negative attitudes of the society.

Judgment and stand of the society regarding adoption have a significant effect on the decision and belief of participants to adopt a child. Some participants mentioned the fear of disclosure of child adoption in the future as the reason for not getting along with the issue of adoption, as that will cause mental trauma to the adopted child.

"When you tell him/her or s/he hears it from someone else, it will affect him/her, it hurts."

(31 years old lady, diploma, housewife, 6 years of infertility)

Most participants mentioned that attitude of other people towards adoption is negative. Couples who take measures to adopt a child, are stigmatized by other people and it will add to their problems.

"In the little villages, if you adopt a child who is not yours, people say words which lead to more problems."

(43 years old woman, elementary school, housewife, 14 years of infertility)

4. Discussion

The decisions of our study participants regarding their willingness or unwillingness to adopt a child were based on different factors. These factors comprised cultural and legal barriers, attitude of husband towards adoption, attitude of others around about adoptions, and the laws governing the adoption terms in the country. All these issues indicate the unwillingness of the majority of participants to adopt a child. In this regard, [Bokaie et al. \(2012\)](#) reported that in 85% of cases, Iranian infertile women were unwilling to have an adopted child, while in Nigeria, 59.3% were opposed to adoption. The high acceptance level in Nigeria is most probably due to the growth of knowledge about adoption with the improvement of public awareness through the media, social research, and other sources ([Ojelabi et al. 2015](#)). Results of Bokaei et al. study showed that in 78% of cases, hope to give birth to their own child is

the main obstacle in adoption. Most couples prefer to have no child or think of new treatments.

Preference of any type of treatment over adoption, the parents' being left alone by the adopted child when they get old, fear of disclosure of adoption, and negative attitude of society towards adoption are themes found in our study which were similar to themes found in other studies in India (Bharadwaj 2003; Joshi et al. 2015), Nigeria (Ojelabi et al. 2015), and Pakistan (Sami & Tazeeni 2012). Bagheri et al. in their study concluded that if couples felt comfortable in terms of attitude of society and others towards adoption, they would have a more favorable attitude and acceptance towards adoption (Bagheri et al. 2009). For example, in Western countries, adoption is a well-known practice and many organizations are ready to help with infertile couples' wants. It seems that adoption in America is higher than all other countries of the world. In 2000, the number of adopted children in this country was 127985 cases (61.5%) (Bernal et al. 2007). Surprisingly, in Gambia, infertility is considered as a disgrace, but child rearing is a strong and rooted tradition. About 43% of infertile couples in Gambia have an adopted child (Sundby 1997). Although one of the concepts extracted from our study data was to adopt a child as "doing a good deed," which was also reported by Aliakbari & Tavakol (2010) in their qualitative study, performance of infertile couples in Iran is very low (despite this belief) with regard to adoption.

In Nigeria, the most common reasons for reluctance to adopt a child were cultural reasons such as unknown family history of the child, lack of legal rights (like inheritance), fear of child's abnormal behavior or disease (such as mental illness or epilepsy that were inherited from his or her biological parents), and finally fear of the being left alone by the adopted child (Adewunmi et al. 2012; Ojelabi et al. 2015). It seems that in our study, the focus was not on the themes related to children, because participants had no intention of adoption.

In line with the beliefs of our study participants, for some respondents in Nigeria, the prospective of adoption was psychologically unacceptable. They felt that they could not love this child like their own birth child (Adewunmi et al. 2012; Ojelabi et al. 2015). Some participants claimed that if they want to adopt a child, they adopt a child of their own relatives. In this case, they are both aware of family history of the child and even if the child is supposed to inherit future wealth from them, he or she is a relative and acquaintances. In this regard, Adewunmi et al. (2012) showed that respondents were willing to adopt a child of a relative, friend, or distant acquaintance.

Nigerian infertile women with positive tendency towards adoption, mentioned family reasons such as lack of support from their husbands, parents, or husband's family for their disagreements in marital relations and disinterest in adoption (Ojelabi et al. 2015). This issue was similar the theme of "the decision of the husband depends on the reaction of peoples around" in our study.

The duration and type of the treatment were other determining factors for our study participants to think about the adoption. A study in the United States of America also showed that infertility period for more than 5 years (Bernal et al. 2007) and in Cameroon for over 10 years (Nguefack et al. 2014) were significantly associated with a positive attitude towards adoption.

Participants complained of strict laws and regulation that the government has enforced for adoption, especially the financial terms that an infertile couple should have to adopt a child. According to the Welfare Organization, the complexity of the legal process to adopt a child in Iran is one of the obstacles in adoption (Bokaie et al. 2012). In Nigeria, infertile couples who earn more than 650\$ a year can afford more than other couples to deal with strict rules of adoption in terms of financial terms. While this might be discouraging for couples who earn less and live in poorer conditions (Adewunmi et al. 2012). In Iran, the maximum age for child adoption is 50 years (Iran, No. 4015) and in Nigeria for a woman who has no children, this age is 45 years and since it take a long time for infertile couples to make a decision on adopting a child, this law creates a problem for them (AGBO, 2014).

Although the issue of "mahramiat" (the concept of unmarriageable kin) of children to parents are important for our participants, religious reasons that Adewunmi et al. (2012) mentioned in their study, were not considered by our participants. In the study of Adewunmi et al. a number of Christian respondents were not willing to adopt a child, since they felt that adoption means lack of faith in God, because their prayers were not answered for the child.

Authorities of child adoption mentioned that among the applicants of child adoption, those infertile couples in which the husband was infertile, were more willing to adopt a child. Studies in Iran also show that the problem of 70% to 80% of infertile couples, who are applicant of child adoption, is related to male infertility. One justification for this issue is the patriarchal dominance governing over child adoption process. Couples that their infertility is related to men are more willing to adopt a child (Naghinia 2000; Sardari 2001; Razzaghi 2006). The results of these studies were in line with the themes found in our study. In

couples whose infertility is related to the wife, remarriage of the husband might be chosen as a solution which sometimes is associated with the stress and divorce. In this case, we see families with two or more wives (Razzaghi 2006). Unfortunately, this reflects the aspects of gender hierarchical and hegemonic relationships (Healy 2000).

Comparing our obtained results with the results of studies in developed societies like Sweden shows that although infertility is a central issue of life in this country, infertile couples reduce the consequences of infertility by doing social activities and keeping children of friends and acquaintances (Wirtberg et al. 2007). In developing countries like our society, the importance of blood ties and cultural factors are barriers for child adoption and infertile couples prefer to continue treatment as much as possible and finally get divorce and choose polygamy over adoption. Also, in Cameroon one reason for infertile women opposing to the adoption is their family stigmatized (Nguefack et al. 2014). Unfortunately, despite the importance of nurturing the orphans in Islam, this religious capacity has not been used appropriately to increase the willingness for child adoption.

Our findings showed that the experiences of participants in this study about child adoption were similar to each other and like the experiences of other developing societies in which, child adoption is typically the last solution among the methods of infertility treatments that are chosen by infertile couples and in some cases, remarriage or divorce are preferred to child adoption. Therefore, we suggest that social workers, nurses, and midwives, especially those with community orientation be present in all infertility centers to provide the information about the adoption process and support infertile couples regarding the challenges that they have in the process of child adoption. This support can even be extended to the future for parents of adopted children. On the other hand, raising awareness and enlightenment in society through the media are critical to minimize the socio-cultural consequences of child adoption, because adoption is not only desirable to improve the quality of life in infertile couples, but also leads to upbringing and growth of children in a lovely environment and is beneficial for both the nation and the government.

Research Limitations

Because infertile couples with high levels of income refer to private infertility centers which the researchers were not allowed to study them, our study participants did not have a very high income. However, we tried to

include among our participants, those couples who had the highest incomes.

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Conflict of Interests

Authors declared no conflict of interests.

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The Effect of Teaching Coping Skills on the Anxiety in Caregivers of Patients with Cancer Undergoing Chemotherapy



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ABSTRACT

Background: Long-term hospitalization for cancer treatment can prevent the continuation of a normal life of patients with cancer and their families. In this regard, caregivers face with problems such as psychological stress, hopelessness, fear, anxiety, and feelings of depression. The aim of this research was to investigate the effect of teaching of coping skills on the anxiety in caregivers of patients with cancer undergoing chemotherapy.

Methods: This research was a quasi-experimental study, pretest-posttest design with control group which started from October 2014 and lasted until February 2015. In this study, 62 caregivers of cancer patients were selected by convenience sampling method. A total of 30 subjects were non-randomly assigned in the experimental (intervention) group and 32 ones in the control group. The intervention was done based on a defined plan, which included teaching coping strategies to the experimental group in 4 sessions (45-60 minutes each session) using booklet and question and answer (QA) meeting. The control group received routine education. After 4 weeks, both groups were compared in terms of anxiety using Beck anxiety inventory questionnaire. The data were analyzed using SPSS 18 software, through performing paired t test, the Chi-square test, the Independent t-test, and Fisher's exact test.

Results: There was no significant difference regarding the anxiety between the experimental and control groups before the intervention ($P=0.122$). Four weeks after the intervention, anxiety of the experimental group improved, but no improvement was observed in the control group. Therefore, the two groups had statistically significant differences in this regard ($P=0.001$).

Conclusion: With regard to anxiety of the caregivers of the patients with cancer undergoing chemotherapy, the results showed the effectiveness of intervention i.e., teaching coping skills. Considering the effectiveness of teaching coping skills and consequently decreased anxiety in the caregivers of patients with cancer patients undergoing chemotherapy, it is suggested that this intervention be included in nurses family-centered care program.

Keywords:

Anxiety, Cancer,
Caregivers, Coping skills

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1. Background

Cancer as one of the biggest health problems (Baykal et al. 2009) affects all individuals regardless of race, gender, or social, economic, and cultural status. American Cancer Society has stated that cancer accounted for 9% of deaths worldwide (O'Hara et al. 2010; Siegel et al. 2012). However, chemotherapy is one of the important treatment methods in patients with cancer (O'Hara et al. 2010).

Because of the debilitating nature of the disease and its treatment, many people require help from informal caregivers, who help them with their daily activities. Because of the chronic nature of cancer, patients have to accept long-term treatments with chemotherapy drugs. Treatment lasts weeks or months and its side effects can be nausea, hair loss, fatigue, muscle aches, skin burns, weight changes, and psychological problems (Milbury et al. 2013; Seyed Fatemi et al. 2006). During the caring role of their favorite patients, caregivers regularly face with changes in patient's conditions and developing new situations, which also create changes in their lifestyle (Ferrans et al. 2005).

Meanwhile, the stress of care includes psychological, physical, and social distress imposed to caregivers as a result of caring patients with chronic diseases. Later on, caregivers will face with many problems such as burnout, depression, and anxiety (Abbasi et al. 2013). The burden of care that caregivers experience is different aspects of stress which is due to imbalance between care demand and the availability of resources to meet these demands (Salmani et al. 2014). In a study by Park et al. the prevalence of anxiety among caregivers of patients with cancer was reported to be 38.1%. Of them, 20.3%, 13.3%, and 4.6% had mild, moderate, and severe anxiety, respectively (Park et al. 2013).

Caregivers face with problems such as psychological stress, despair, fear, anxiety, and feelings of depression. Anxiety is a condition characterized by feeling of fear accompanied by physical symptoms indicative of excessive activity of the autonomic nervous system which actually is a response to an unknown and ambiguous threat combined with conflict. Meanwhile, attention should be paid to the needs of family caregivers so that they can continue to take care of their own health and provide the best possible care for cancer patients (Porter et al. 2011).

Caregivers of patients with cancer experience various degrees of fatigue, anxiety, and burden of care. They have

low quality of life and have to meet the needs of their own and patients at the same time. Therefore, health care providers must pay attention to caregivers in terms of fatigue, emotional stress, burden of care, and quality of life (Fotokian et al. 2004; Johansson et al. 2004). Also, older caregivers have more stressful relationships with the patients. Based on the reports, they have higher levels of anxiety with less social support (Ghaedi Grant et al. 2013).

However, any change in human life either pleasant or unpleasant requires a kind of readjustment (Momeni et al. 2013). Coping mechanisms can be considered a set of functions that are able to help the person tolerate, avoid, or minimize the effects of stress. Family caregivers can benefit from coping mechanisms to cast aside the caring anxiety. Researchers in this field believe that coping strategies can be considered as mental and behavioral efforts to manage the internal and external changes, because these changes create stress in the person and coping is a way to control the stress. Therefore, coping is an active and dynamic process, which should be altered constantly based on environmental changes (Gharraee et al. 2008).

To describe the results of the program, according to Demirbag et al. (2012) study, it is expected that training increases awareness of caregivers and decreases their anxiety (Demirbag 2012). The purpose of this study was to determine the effect of teaching coping skills on the anxiety of caregivers of patients with cancer undergoing chemotherapy.

2. Materials & Methods

This research was a quasi-experimental study, pretest-posttest design with a control group. In this study, the effect of teaching coping methods on the anxiety in caregivers of patients with cancer undergoing chemotherapy has been investigated. After receiving ethical approval of Iran University of Medical Sciences Ethics Committee and permission to conduct the study the researcher referred to the study setting (health centers of Iran University of Medical Sciences) according to a predetermined program.

After obtaining permission from the hospital authorities and the chemotherapy section and introduction to the research units, the researcher explained the study objectives and how the research was going to be conducted. Then, after taking written informed consents and based on the inclusion criteria, the study participants were selected with these criteria: being 18 years or older, passing at least 6 months from the patient's diagnosis, being patient's first degree family member, being able to speak, read, and write in Persian, no having any mental and physical disorders, also the cancer patients were in the first or second stage.

Participants

Study sampling was done by convenience sampling method. To determine the sample size at 95% level of confidence, 80% power, and assuming that the effect size of teaching coping skills on the burden of care caregivers (compared with the control group) should be at least 5 ($d=5$) to be considered statistically significant, the sample size in each group was calculated after inserting the proper amounts in the following formula:

$$N = ((Z_{(1-\alpha/2)} + Z_{(1-\beta)})^2 \times 2S^2) / d^2$$

Then, 30 participants were non-randomly assigned in the intervention group and 32 participants in the control group. However in the beginning of this research, 78 caregivers of patients suffering from various types of cancers (40 caregivers in experimental group and 38 ones in the control group) were selected. They referred to receive chemotherapy courses for their patients. During the training, due to the debilitating nature of the disease, its rapid progression, metastasis, and many concerns resulting from caring and everyday life, 10 caregivers left the research during training. The researcher compensated the loss with recruiting samples from above mentioned sections during 4 training sessions and continued that as far as the samples size reached to 30 trained caregivers. Also, during sample collection, 6 patients of the caregivers in the control group died due to illness and the size of the sample dropped to 32 people. The subjects in the sample were caregivers whose patients were receiving chemotherapy. They referred to research environment of Oncology for chemotherapy along with their patients in hospitals affiliated to Iran University of Medical Sciences, including Hazrat-e-Rasool and Firoozgar hospitals.

To prevent data leakage, the researcher randomly selected two centers for choosing intervention and control samples. Thus, the experimental group were selected from Hematology section 1 and 2 of Firoozgar Hospital and control group were selected from the Hematology and Oncology sections and clinic of Hazrat-e-Rasool Hospital. Based on the exclusion criteria those caregivers who did not attend one of the training sessions, whose patients' diseases spread (metastasis) or aggravated from stage 2 to higher (diagnosed by the physician), died, or changed treatment from chemotherapy to radiotherapy, were removed from the study.

Intervention

Both groups completed the study questionnaires before the intervention, then the control group received routine training, but the intervention group were divided into small groups (5 to 8 people in each group) and undergone train-

ing on coping skills in 4 sessions of 45-60 minutes long using booklet and questions and answer (QA) meetings. All sessions were held in the charity building (Guest House) of Firoozgar Hospital along with the refreshment. Sessions were held separately for each group and participants were informed in advance about the schedule and the time of the next session of classes and they were also contacted on the day of the session. At the end of each session, participants were asked to do assignments for the next session and necessary explanations were given about how and why to do the assignment. The content of the teaching booklet was prepared by the researcher and using existing resources and its validity and reliability were confirmed by 10 members of the faculty of Iran University of Medical Sciences.

Educational topics (booklet) were as follows. The first session: concept of the crisis, types of the crisis, voluntarily evaluation of the problems of the caregivers to have an overall idea; summary of the second session: reviewing the previous subjects, the concept of coping, coping types, inefficient coping, questions about the purposes and experiences according to the subjects taught for collaboration and evaluation; summary of the third session: reminding the past content and beginning to teach effective coping methods, questions about individuals' experiences to assess their performance in the past; summary of the fourth session: review of the previous session, teaching anxiety relaxation techniques and conclusion, summation of the topics, presentation of the report regarding previous assignments, questions about family experiences and the methods used at the time of anxiety, and questions and answers about the materials taught. After 4 weeks, questionnaires were completed again by both intervention and control groups.

Data collection

Following instruments were used in this study:

Demographic data questionnaire

This questionnaire consisted of two parts. Part 1 was dedicated to the information about caregiver and the second part to the information on the patient receiving chemotherapy (Table 1). Information about the caregiver comprised age, gender, education level, marital status, place of residence, occupation, economic status, field of study, occupation before being caregiver, income, history of caring, having another patient at home, insurance coverage. The patient's information (who was undergoing chemotherapy) included age, gender, education level, stage of cancer, type of cancer, and the number

of chemotherapy sessions. The validity and reliability of this questionnaire were confirmed by 10 members of the faculty of Nursing and Midwifery of Iran University.

Beck anxiety inventory (BAI)

This questionnaire had 21 questions each of them scored on 4-point scale from 0 to 3. Each of the test material describes one of the most common symptoms of anxiety (mental, physical, panic symptoms). In this regard, total scores from 0 to 21 indicate very mild symptoms of anxiety, 22 to 35 indicates moderate anxiety, and over 36 will show severe anxiety (Kazemi 2003) (Table 3).

In a survey by Pedram et al. (2010) entitled 'The effectiveness of cognitive-behavioral group therapy on the treatment of anxiety disorders, depression, and giving hope to women with breast cancer', Kazemi (2003), as cited in Beck (1988), the internal consistency of this scale was 93% and its test-retest reliability was 75%. The reliability of this test in Iran calculated by the Cronbach α (n=34) has been reported as 78% (Frikhsdottir et al. 2011).

Ethical consideration

With regard to the observance of ethical principles in this study (registered with the code of ethics ir.iiums.rec.1394.9211196250), the study participants were assured that any time they would not like to decline training sessions, they can leave and there would not be any interference in health care of their patients. Also, an educational booklet along with the introduction of publications of nutrition books about cancer was presented to all participants (the intervention and control groups).

Statistical analysis

Data were analyzed by performing paired t-test, the Independent t-test, the Chi-square test, and Fisher's exact test, in SPSS version 21..

3. Results

The results showed that majority of caregivers in the experimental group (70%) and in the control group (59.4%) were female (P=0.382). Regarding job status, most caregivers were employed, 40% in the experimental group and 8.3% in the control group (P=0.565). The duration of disease and caring from patients and their caring by caregivers was about 6 to 10 months, which comprised 63.3% in the experimental group and 53.1% in the con-

trol group and there was no significant difference between two groups in this regard (P=0.299). In terms of insurance coverage, 86.7% in the experimental group and 100% in the control group used insurance services which according to Fisher's exact test, there was no significant difference between them (P=0.049) (Table 1).

The mean(SD) of anxiety scores in caregivers of patients with cancer undergoing chemotherapy in the experimental group were 18.60(12.57) and 23.56(12.31) in the control group before the intervention, which changed to 12.07(8.94) in the experimental group and 27.47(11.50) in the control group after the intervention. In terms of comparing anxiety before the intervention, the experimental and control groups had no significant difference, although control group showed higher anxiety (P=0.122). Comparison of anxiety in both groups, 4 weeks after the intervention showed statistically significant difference (P=0.001) (Table 2).

Changes in subscales of caring anxiety in the experimental group showed that after the intervention the means of all 3 subscales decreased but in the control group the means of caring anxiety increased (Tables 3 and 4). The results in Table 5 indicate that according to P-value of the Independent t-test, changes in the two study groups with regard to caring anxiety had statistically significant differences (P<0.001). The mean of changes for caring anxiety in the experimental group decreased after the intervention but the mean for burden of care increased in the control group. Considering the statistical results, changes in caring anxiety subscales showed statistically significant differences between two groups. Assessment of changes in caring anxiety subscales in the experimental group showed that the means of all 3 subscales in this group decreased after the intervention, but in the control group this change was uprising and the mean of caring anxiety scores increased (Table 6).

4. Discussion

Our findings indicated that teaching coping skills reduced anxiety in caregivers of patients with cancer. In Chien et al. study with the aim of investigating the effect of need-based training program on the level of anxiety in caregivers in the intensive care unit it was showed that anxiety level in the family of intervention group decreased compared to the control group which reflects the effectiveness of this training. This finding is consistent with the results of the current study (Chien et al. 2006). Although this study has been conducted in another ward of the hospital and on different patients of the current study, it demonstrates the effectiveness of need-based training on

Table 1. Demographic characteristics of the study subjects in experimental and control groups of caregivers of the patients undergoing chemotherapy.

Characteristics		Experimental group (n=30)	Control group (n=32)	P-value	
		No.(%)	No.(%)		
Caregivers	Relationship with the patient	Wife	9 (30)	10 (31.3)	<0.99
		Parents	3 (10)	4 (12.5)	
		Siblings	3 (10)	3 (9.4)	
		Son/daughter	15 (50)	15 (46.9)	
		Total	30 (100)	32 (100)	
	Age, y	≤30	8 (26.7)	10 (31.3)	0.369
		31-40	13 (43.3)	11 (34.3)	
		41-50	6 (20)	5 (15.6)	
		≥51	3 (10)	6 (18.8)	
		Total	30 (100)	32 (100)	
Marital status	Single	11 (36.7)	9 (28.2)	0.057	
	Married	16 (53.3)	23 (71.8)		
	Divorced	3 (10)	0 (0.0)		
	Total	30 (100)	32 (100)		
Employment status	Employed	12 (40)	14 (43.8)	0.565	
	Housewife	11 (36.7)	14 (43.8)		
	Student and unemployed	7 (23.3)	4 (12.5)		
	Total	30 (100)	32 (100)		
Insurance coverage	Yes	26 (86.7)	32 (100)	0.049	
	No	4 (13.3)	0 (0)		
	Total	30 (100)	32 (100)		
Cancer patients undergoing chemotherapy	Duration of the disease, month	≤5	1 (3.3)	1 (3.1)	0.299
		6-10	19 (63.3)	17 (53.1)	
		11-15	6 (20)	6 (18.8)	
		≥16	4 (13.3)	8	
		Total	30 (100)	32 (100)	
	Duration of chemotherapy, month	≤5	16 (53.3)	16 (50)	0.356
		6-10	10 (33.3)	7 (21.9)	
		11-15	2 (6.7)	6 (18.8)	
		≥16	2 (6.7)	3 (9.4)	
		Total	30 (100)	32 (100)	

Table 2. Numerical caring anxiety in caregivers for anxiety before the intervention in the experimental and control groups.

Caring anxiety	Group	Experimental group		Control group	
		No. (%)		No. (%)	
Mild		17 (56.7)		14 (43.8)	
Moderate		10 (33.3)		11 (34.4)	
Severe		3 (10.0)		7 (21.9)	
Total		30 (100.0)		32 (100.0)	
Mean±SD		18.60±12.57		23.56±12.31	
Independent t-test result		df=60	t=-1.570	P-value=0.122	

Client-Centered Nursing Care

Table 3. Numerical caring index of caregivers for anxiety after the intervention (4 weeks later) in the experimental and control groups.

Caring anxiety	Group	Experimental group		Control group	
		No. (%)		No. (%)	
Mild		26 (86.7)		10 (31.3)	
Moderate		4 (13.3)		13 (40.6)	
Severe		0 (0.0)		9 (28.1)	
Total		30 (100.0)		32 (100.0)	
Mean±SD		12.7±8.94		27.47±11.50	
Independent t-test result		df=60	t=-5.861	P-value=<0.001	

Client-Centered Nursing Care

the anxiety of families and caregivers of patients. Reducing anxiety level in caregivers of patients with cancer undergoing chemotherapy, although statistically significant based on studies, needs effective training on longer time schedules since the anxiety (though with lower degrees) still exists.

In a study by Sadeghi et al. which investigated the effect of involving the patient's families on their anxiety levels, the results showed that the average severity of anxiety in participants was in very severe situation in the control group and moderate in the experimental group after the intervention. Comparing anxiety scores in experimental and control groups before and after the intervention showed that the average anxiety scores decreased after the intervention in the experimental group. In other words, involving family members in daily care of their patients reduces effectively the anxiety of the subjects which reflects the effectiveness of the intervention, in general, on the anxiety of the family (Sadeghi et al. 2013).

The results of the study by Ghaedi Heidari et al. also showed that combination of family psychoeducational interventions with common mental health care had considerable effect on reducing mental health problems of family caregivers. Based on their study, the family education program could be effective in reducing mental health problems (depression, anxiety, and stress) of family caregivers of patients with dementia (Ghaedi Heidari et al. 2014) that like the current study demonstrated the effectiveness of teaching in the context of behavioral change and as a result, improvement of psychological symptoms.

Another study had shown that average scores of depression, anxiety, and stress in the experimental group significantly has been reduced compared to the scores of the control group in the caregivers of patients with schizophrenia and mood disorders (Sadeghi et al. 2013). Furthermore, the family education program to reduce depression, anxiety, and stress has been effective in caregivers of mental patients and it has potentially improved and enhanced the quality of lives of patients and caregivers. Like the current study, the evidence supports the positive

Table 4. Comparison of anxiety in caregivers of patients undergoing chemotherapy before and after the intervention in the experimental and control groups.

Anxiety	Measurement stage	Experimental group (n=30)		Control group (n=32)		P-value
		Mean	SD	Mean	SD	
Anxious mood	Before the intervention	2.33	1.90	2.75	2.54	0.466
	After the intervention	1.83	1.72	3.12	2.60	0.024
	Difference	-0.50	-1.33	0.37	1.72	0.029
Subscales Specific phobia	Before the intervention	3.90	2.69	5.06	2.37	0.076
	After the intervention	2.90	2.40	6.28	1.89	<0.001
	Difference	-1.00	0.29	1.22	1.88	<0.001
Auto signs of hyperactivity and anxiety motor stress	Before the intervention	12.37	9.54	15.75	9.77	0.173
	After the intervention	7.33	6.44	18.06	8.93	<0.001
	Difference	-5.03	-4.03	2.31	4.04	<0.001
General anxiety	Before the intervention	18.60	12.57	23.56	12.31	0.122
	After the intervention	12.07	8.94	27.47	11.50	<0.001
	Difference	-6.53	-5.07	3.90	5.02	<0.001

Client-Centered Nursing Care

Table 5. Numerical caring index in caregivers in experimental and control groups.

Intervention group	Experimental	Control	Independent t-test results
	Mean±SD	Mean±SD	
Pre	60.57±18.12	56.31±23.12	t=-1.570 df=60 P-value=0.122
Post (4 weeks after the intervention)	12.8±07.94	47.50± 27.11	t=-5.861 df=60 P-value<0.001
Difference	53.07±6.5	90.02±3.5	t=8.132 df=60 P-value<0.001

Client-Centered Nursing Care

impact of education on reducing anxiety. Also, in the present study, although comparing the mean scores of anxiety in caregivers of cancer patients undergoing chemotherapy before and after the intervention in the experimental and control groups showed the reduction of anxiety in their caregivers, which was statistically significant, this anxiety still exists (though in lower degrees) and demonstrates the need for effective training on longer time schedules.

Regarding anxiety in caregivers of patients with cancer undergoing chemotherapy, identifying variables associ-

ated with anxiety in caregivers could help optimize care-support services and determine the effective solutions for variables involved in anxiety and depression at the specific time. Therefore, it is suggested that studies be conducted with larger samples in different medical centers with various socio-economic levels.

Designing projects based on spirituality, and with regard to the religious community of Iran have applications in solving problems and developing consistency. To examine the spectrum of caregivers' and their needs and problems

and ways to provide information to patients' families, designing field studies can be beneficial. Furthermore, providing educational programs and studying psychological care of caregivers and seeking expert consultation are recommended for patients and their caregivers. Considering the study limitations and results, it is suggested that the effect of more comprehensive training programs, including psychotherapy approaches like mental imagery be investigated on anxiety and stress in care of caregivers. Also, with regard to the transferability of anxiety of caregivers to their patients, the mentioned psychological indicators be simultaneously investigated in the patients.

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Conflict of Interest

The authors declared no conflict of interests

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Comparing the Effect of Acupressure and Cryotherapy on the Pain Caused by Removal of Chest Drain Tube in the Elderly Patients Undergoing Open Heart Surgery



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ABSTRACT

Background: Aging has a growing trend in the world. The elderly experience a high incidence of hospitalization and coronary bypass surgery compared with other age groups, and pain is the most common complaint in these patients. This research was conducted to compare the effect of acupressure and cryotherapy on the pain of removing drain tube from the chest of the elderly who have undergone open heart surgery.

Methods: In this quasi-experimental clinical trial, 150 elderly people undergoing coronary artery bypass grafting with drain tube in their chests and hospitalized in the Intensive Care Unit of Shahid Rajaei Hospital (affiliated to Alborz University of Medical Sciences and Health and Treatment Services, Tehran, Iran) were selected through random sampling method. Then, they were divided into 3 groups of acupressure, cryotherapy, and control. The acupressure group received pressure on ST36, P6, LI4 points. The cryotherapy group received cold therapy through applying three packs of cooling gel, and the control group received routine postoperative cares. The pain intensity was measured 20 minutes before the insertion of the tube, during insertion, and 10 minutes after removal of the drain tube. The tools for collecting data were abbreviated mental test form, demographic questionnaire, and visual analogue scale. The obtained data were analyzed through descriptive and inferential statistics by SPSS version 20.

Results: In terms of demographic characteristics, the patients were homogenous. Before the intervention, there were no significant differences among three groups in terms of pain intensity ($P=0.93$). However, after the intervention, pain intensity, immediately after, and 10 minutes after removal of chest tube, significantly reduced in the experimental groups compared with the control group ($P<0.001$). In general, reduction of pain intensity was higher in the acupressure group compared with the other two groups ($P<0.001$).

Conclusion: Applying acupressure on ST36, LI4, and P6 points is effective in reducing the intensity of pain caused by removal of drain tube from the chest of the elderly patients. It is recommended as a safe and inexpensive drug-free approach to control pain caused by the removal of drain tube.

Keywords:

Ageing, Chest tube, Pain, Acupressure, Cold therapy (Cryotherapy)

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1. Background

Ageing has a growing trend in the world (Rouch 2014). According to a report prepared in 2012 by WHO, it was estimated that the world elderly population who are 60 years of age and older increases from 11% in 2000 to 22% by 2050 and the number of people above 80 years of age increases by approximately 4 times from 2000 to 2050, i.e. reaches up to 395 million. The elderly experience a higher incidence of hospitalization, operations, and medical advice compared to other age groups (Eliopoulos 2014). Although the elderly account for about 50% of patients in the intensive care units (ICUs), limited research has been conducted on them (Foreman et al. 2010). Today, coronary artery bypass graft (CABG) is a conventional intervention treatment carried out on patients with coronary artery disease. Although many advances have made in drug treatment and catheterization procedures, surgery interventions are still considered the basic treatment for these diseases (Hosseinian et al. 2014).

One of the operations that require thoracic cage surgery and sternotomy is open heart surgery, which has increased significantly in recent years (Moemenabadi 2010). This operation often requires placing a chest drain tube, unilateral or bilateral, in the pleura, pericardial cavity, or mediastinum (Khalkhali et al. 2014) to maintain hemodynamics and cardiovascular function (Zisis et al. 2015; Al-Otaibi et al. 2013). However, removing the tube causes pain (Kang et al. 2014).

Research in the past decade has shown that removing the chest drain tube produces significant pain (although short term) and has been known as a painful procedure throughout the world (Hood et al. 2014). In other words, it has been described as one of the most unpleasant memories experienced by patients during the postoperative period (Gorji et al. 2014). Pain is among the most common complications occurring after operation (Miller et al. 2010) and is significantly intense in the elderly patients (Kaye et al. 2010). Meanwhile, with increase in age, pain tolerance decreases, which leads to interference with daily life and dependence on spouses or significant others (Mirzamani et al. 2008). All these matters prove the importance of pain and its control and management (Sahbaei et al. 2014).

Considering that nurses are in direct and continuous contact with patients, they should assume an important role in assisting the patients to accept the drug-free treatments such as complementary and alternative medicine.

With regard to this responsibility, they (nurses) must first acquire adequate and complete information regarding the effectiveness of such therapy and its alternative, so that they would be able to teach it (Brolinson et al. 2001).

There are pharmacological and nonpharmacological methods to control pain. The pharmacologic approaches at the time of drain tube removal include using painkillers and sedatives, muscle relaxants, and non-steroidal anti-inflammatory drugs (EL-Gendy 2015).

Several decades ago, researchers developed pharmaceutical protocols for reducing pain arising from chest tube removal (Hood et al. 2014). They introduced it as the preferred method of treatment (Zisis et al. 2015). Nevertheless, studies have showed that the current protocols lack useful effect on managing pain, are undesirable, and should be revised (Hood et al. 2014). Meanwhile, pharmaceutical methods are expensive and have adverse effects on the cardiovascular system (Gutgsell et al. 2013).

Drug treatment in the elderly, as part of the physiological process of aging, causes degeneration of the autonomic nervous system and gradual decline in the ability to regulate cardiovascular responses (Wang et al. 2013). Pharmacokinetic changes put these patients at high risks (Bickley & Szilagyi 2013), which is accompanied with side effects such as drowsiness, gastrointestinal bleeding, and addiction (Yeh et al. 2014; Yeh et al. 2013). Furthermore, using medications, especially in the elderly, is accompanied with complications because of their physical changes due to aging. Therefore, with restriction of using pharmaceuticals in recent years, drug-free treatments and complementary medicine are often preferred (Moemenabadi 2010).

Current studies have shown that the use of nonpharmacologic interventions have been very effective for prevention of pain (Al-Otaibi et al. 2013; Khalkhali et al. 2014; Hood et al. 2014). Nonpharmacologic methods to control pain are simpler and less expensive (Allred et al. 2010). A variety of nonpharmacologic interventions such as percutaneous electrical nerve stimulation (Johnson et al. 2015), acupuncture (Geib et al. 2015), acupressure (Chen et al. 2015), hypnosis therapy (Cordia et al. 2015), behavior therapy (Karlin et al. 2015), and massage therapy (Dreyer et al. 2015) have been emphasized. The results of a systematic review showed that acupressure was an effective and noninvasive method for relieving various types of pain and could be used as a training program in nursing curriculum (Chen & Wang 2014). Among other nonpharmacological methods of pain relief is cryotherapy, which was first described by Hippocrates

(Osunde et al. 2011). Also, there are behavioral-psychology methods such as deflection of the senses and music (Tuckett et al. 2015). Acupressure is one of the therapeutic relief approaches with many advantages that can be used by physicians, nurses, and even patients themselves and has had positive results in nursing interventions and patients' care (Rowbotham 2005).

Acupressure as a branch of acupuncture has been much discussed about (Mehdizadeh 2002; Aghamiri et al. 2005). It is noninvasive, has low cost, needs no device for its administration, is accessible compared to other medical methods, and eventually is easy to learn and can be carried out by the patients themselves or by their caregivers. As a result, it reduces the referrals to medical centers (Sadri et al. 2006). This alternative medicine was invented in China and focused on preserving the function of vital organs through circulation of blood and energy in the body (Chen & Wang 2014). It sets in motion the energy flow, Chi, along 12 channels of energy in the body (Hamidzadeh et al. 2012). Any blockage along these channels leads to extremes of energy in the body and development of illness.

Hegu point, LI4, is one of the important pressure points related to the large intestine (Kaviani et al. 2012). It is located at the back of the hand between the first and second metacarpal bones, more precisely on the radial side of the second metacarpal bone. At this point, the energy current is close to the skin surface and can easily be stimulated by pressing (Hamidzadeh et al. 2012). Point ST36 or Zusanli point, is one of the most efficient acupoints associated with a wide range of effects such as analgesic and antispasmodic effects, and is the point where general tone is created (Stux et al. 2007). P6 or Nei guan point is located on the anterior surface of the forearm almost three fingers above the wrist between the flexor carpi radialis and palmaris longus tendons (Alesandrini et al. 2012). Several studies with different results have been conducted regarding the effect of acupressure on pain relief (Chen & Wang 2014), labor pains (Akbarzadeh et al. 2015; Dabiri & Shahi 2014), dysmenorrhea (EL-Gendy 2015; Wang et al. 2015), back pain (Akbarzadeh et al. 2015; Chen et al. 2015), fatigue (Eglence et al. 2013), sleep (Simoncini et al. 2015), anxiety (McFadden et al. 2012), nausea and vomiting (Saber et al. 2014), quitting smoking (Yeh et al. 2014), depression, constipation (Parker 2014), and pain of removing drain tube (Moemenabadi 2010). This type of medical approach is effective even in promoting spiritual health (Wein 2014).

Cryotherapy has been introduced as a noninvasive and nonpharmacological method. It is inexpensive and easily applicable to relieve the pain (Haynes 2015). Various

methods of applying cryotherapy include using ice pack, ice massage, cold bath, and cooling gel packs. Cryotherapy, in its first minutes of application produces an uncomfortable sensation (Leventhal et al. 2010), but then the cold results in reducing the blood flow in the tissues and cell metabolism of the injured area (Modabber et al. 2013). It decreases vascular permeability (Dykstra et al. 2009), reduces inflammation and muscle pain (Salvo 2015) and eventually increases pain threshold (Hauswirth et al. 2011). In a study, it has been proven that, compared to other sedatives, cryotherapy has been effective for relieving postoperative pain (Zisis et al. 2015). In general, in a meta-analysis study, cryotherapy intervention has been introduced as an easy, affordable, and executable intervention (Wang et al. 2015). Another study also showed that the most effective method to apply cold for pain control is to use cryotherapy in localized form (Ertug & Ulker 2012) and using cooling gel packs would lead to reduction in skin temperature, control of pain, and boosting pain threshold (Khalkhali et al. 2014).

Numerous studies with different results have been conducted on the effect of cryotherapy, for example, its effect on pain of removing the drain tube (Gorji et al. 2014; Payami et al. 2014), pain in breathing and deep coughing after undergoing open heart surgery (Khalkhali et al. 2014), pain of moving the drain tube where it is inserted, pain and anxiety when removing the drain tube (Zisis et al. 2015), pain and anxiety at the time of child delivery (Kaviani et al. 2012), and pain when taking ABG (Arterial Blood Gas) sampling.

In a study by Khorshid and Demir (2010) conducted on 90 patients undergoing open heart surgery, it was shown that cryotherapy was effective in reducing the intensity of pain during removal of the chest drain tube and has postponed the need for sedatives after removal of the drain tube (Demir & Khorshid 2010). In another study conducted in 2013 by Al-Otaibi et al. on 40 patients hospitalized in the operation ward in a hospital in Saudi Arabia, the results showed that cryotherapy (cooling gel) had a significant effect on reducing pain and anxiety level when the chest drain tube was being removed (Zisis et al. 2015). Considering that pain is common and significantly high in the elderly (Eslami et al. 2016; Kaye et al. 2010), the findings of these two studies are encouraging. However, the samples selected for these two studies (Al-Otaibi et al. 2013; Demir & Khorshid 2010) included patients over 18 years old and were not conducted solely on the elderly patients (Miller et al. 2010).

In general, nurses by implementing complementary medicine programs can play an important role in im-

proving the quality of care and saving the treatment costs (Hsiung et al. 2015). Considering the palliative treatments for reducing pain of removing the drain tube and noting that different results have been reported on the effects of nonpharmacologic approaches in reducing pain arising from this procedure, the researchers decided to conduct a study in the ICU with the aim of comparing the effect of acupressure and cryotherapy on reducing the intensity of pain caused by removal of chest drain tube of the elderly who have undergone open heart surgery.

2. Materials & Methods

This research was a quasi-experimental clinical trial in which 150 elderly patients who have undergone open heart surgery at Shahid Rajaei Hospital of Alborz Province were selected. Inclusion criteria were lacking any cognitive impairment or psychological disorders confirmed by using AMT (abbreviated mental test) tool and obtaining a score of at least 7 out of 10; having two chest drain tubes for at least 24 hours (one tube in the mediastinum and one in left pleura); not having received sedatives for 12 hours before the intervention; having normal range BMI (body mass index); lacking any scratch, scars, or disfigurement on the acupressure points of LI4, ST36, and SP6 in the acupressure group, not having received pain killers 4 hours before the intervention; lacking any cold sensitivity or allergy in cryotherapy group; not having serious illnesses such as diabetes, neuropathy, and so on; lacking drug addiction; and not using acupressure for any purpose.

The exclusion criteria included being under mechanical ventilation, suffering from severe vision or hearing disorders, having communication difficulties, sudden changes in the patient's status during the intervention, and pain in other organs and factors affecting the pain in the drain site (such as angina), and not feeling warmth, heaviness, swelling, or numbness during the application of acupressure on points ST36, LI4, and P6. However, no patient was excluded from this study.

Assigning samples to 3 groups (acupressure, cryotherapy, and control) were done through simple random sampling based on drawing lots containing the patients' names, in a way that the patient whose name was drawn first, was placed in the acupressure group, the second name in the cold therapy group, and the third one in the control group (50 patients in each group).

To collect data, a check list containing demographic data, abbreviated mental test (AMT), and visual analogue scale (VAS) of the pain was used. To validate demograph-

ic questionnaire, AMT form, and pain VAS, the content validity method was used. In this regard, after careful review of the books, scientific journals, texts and essays on the subject of this research as well as using the opinions of student advisors, counselors, and statisticians, the researcher prepared the demographic data questionnaire and together with the AMT form and VAS, presented them to 10 faculty members of the School of Nursing and Midwifery of Iran University of Medical Sciences. After collecting and observing the opinions of the faculty members, required modifications were implemented. Then, research tools were presented to Ethics Committee of Iran University of Medical Sciences, and after their approval, those tools were employed in this study.

To determine the reliability of VAS, the Cronbach α coefficient was used to check its internal consistency. In this regard, 10 patients from the research population who had the profile of the elderly patients under the study filled out the questionnaires, and by using the results, the Cronbach α coefficient for VAS ($r=0.85$) was calculated. AMT is an appropriate test to screen the cognitive disorders in the elderly (Hodkinson 1972). This test has been widely used and its validity and reliability have been assessed in different countries. It has been assessed in Iran as regards its validation and showed a very high sensitivity and specificity in distinguishing patients with mild to moderate dementia from those with normal cognitive status. To assess the questionnaire's internal reliability, the Cronbach α coefficient was used which was equal to 0.76. The tool sensitivity and specificity level based on DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition) criteria were 64.9 and 0.64, respectively (Bakhtiyari 2014).

After assigning the samples in one of the three study groups, written consent forms were signed by them, and by asking questions from the patients, the checklist related to demographic information and also AMT was filled out by the researcher. Also, the intensity of pain was assessed by VAS which was used for gathering information prior to the intervention. Performing acupressure and cryotherapy was conducted by the researcher to prevent the bias as much as possible. Prior to the intervention in the acupressure group, the patients were asked to take deep breath and then the pressure was exerted on points ST36, P6, LI4 for a duration of 1 minute (with a sequence of 4 seconds of pressure and 2 seconds of rest). Generally, pressure was applied on each point for 10 minutes on both sides, and acupressure intervention was applied for 30 minutes in total (Chen et al. 2015). The researcher had been previously trained by specialists

in acupressure and acupuncture about these points and held a certificate for carrying out acupressure.

The Hegu point or LI4 is located on the back of the hand between first and second metacarpal bones and more precisely on the radial side of the second metacarpal bone. At this point, the energy flow is closer to the skin surface and can be easily stimulated by finger pressure (Hamidzadeh et al. 2012). By closing one's fingers, the Hegu point is located precisely on the lower section of the fold created between first and second metacarpal bones (Andrews & Dempsey 2011).

Point ST36 (Zusanli) with the width of a knuckle is located on the lateral and lower side of the tibial tuberosity 3 cuns (cun=Chinese unit of length, 1 cun is equal to 3.33 cm) below the knee joint. In other words, it is located below the knee on the anterior tibialis muscle along the stomach meridian (4-finger width down from the bottom of the knee cap along the outer boundary of the shin bone). It is one of the most efficient points associated with a wide range of effects such as analgesia, anti-spasm, relieving fatigue, and generating a general tone (Stux et al. 2007).

The point P6 (Neiguan) with the width of 5 cm is located on the anterior forearm (in the proximal area toward the median plane) 2 cuns above the wrist crease between the tendons of palmaris longus and flexor carpi radialis muscles along the pericardium meridian. These points are known as acupressure points for analgesic effect and reducing postoperative pain (Hsiung et al. 2015).

On each point, pressure was applied by thumb for 4 seconds followed by 2 seconds of rest, and in each minute the cycle was repeated 10 times. This operation was carried out on both sides every 5 minute for 30 minutes (Chen et al. 2015). The accuracy of the point was confirmed when the patient felt warmth, heaviness, swelling, or numbness at that point (Moemenabadi 2010; Chen et al. 2015; Dabiri & Shahi 2014). If the participants express severe pain in the location where pressure was applied, it was halted temporarily and renewed after a few minutes. It is worthy to note that since the average estimated time for the cycle of energy flow (meridian) through the body is 24 minutes, choosing 30 minutes for acupressure intervention was in order to ensure that a full cycle of energy flow through the body has been performed (Dabiri & Shahi 2014).

In several studies, duration of time needed for acupressure intervention has been considered 30 minutes (Chen et al. 2015; Chen & Wang 2014; Dabiri & Shahi

2014). Pressure on each point under consideration was performed simultaneously in a symmetric fashion 20 minutes before removing the drain tube until 10 minutes after extubation. Attempts were made by repeating the application of pressure and using digital scale, to create a certain amount of pressure at each time. In this regard, after the researcher learned the procedure, a pressure equal to 3–5 kg under the right thumb and simultaneously a pressure equal to 3–5 kg under the left thumb was measured. To ensure that there would be no difference between pressures applied by the right and left thumbs, this pressure was calculated by employing the formula $P=F/A$ (Where P is the force applied perpendicular to the surface of an object per unit area over which that force is distributed and is expressed in terms of mm Hg, F is the force in terms of kg, and A is the area of the finger in m^2) (Kaviani et al. 2012). To ascertain of the accurate location of pressure points and the method of applying pressure, the concurrent validity was used.

In this way, the location of the pressure points and the method of applying pressure were approved by the acupuncturist. To check the reliability of the method, the reliability equivalence was used. As such, both the acupuncturist and the researcher applied pressure on the pressure points on 10 patients and the feelings resulting from the correct pressure, including warmth, heaviness, swelling or numbness were assessed and showed a high correlation between 2 mediators. Besides, removal of the chest drains was performed by expert nurses of the ICU in the morning shifts. It was done at the end of inhalation when a pause was made, and measurement of the drain tubes was based on calibrated lines on the tube. Moreover, measuring the distance between the location of the drain tube to the operation suture was carried out by the researcher using a calibrated ruler.

In the cryotherapy group, a cooling gel was placed on the site 20 minutes before removing the chest drains. Studies have shown that it requires 20 minutes to get the physiological effects in the cryotherapy method, and after that time, the reduction in the skin temperature reaches a constant level (Payami et al. 2014; Kol et al. 2013). In this study, applying cryotherapy was done through using 3 packs of cooling gel ($0^{\circ}C$, 8×10 cm) (Bespar Iran Javidan Gostar Co.) (Gorji et al. 2014). They were applied on the periphery of the drain tube. In the control group, only the postoperative routine cares were performed.

In all groups, measurement of the pain intensity was recorded by the researcher's assistant (who had previously received required training) using the VAS criteria, 20 minutes before, immediately after, and 15 minutes after

the removal of the chest drain tube. Examining the intensity of pain 15 minutes after drain removal was documented on several studies (Al-Otaibi et al. 2013; Khalkha ali et al. 2014; Gorji et al. 2014; Payami et al. 2014). The pain intensity 20 minutes before the intervention was compared among three groups. In all groups, after the intervention, collection of data (filling out demographic questionnaire and VAS questionnaire) was carried out. Patients were asked to reflect the intensity of pain that they experience on the VAS.

They were assured that acupressure and cryotherapy had no known complications and in case of any complication, the physician would be alerted. Also, if they were disinterested to take part in the study, they could exit which would not have any effect on their routine care. Furthermore, the same researcher performed the acupressure on all study patients, to prevent bias to the

feasible extent. However, it was not possible that the researcher and all the elderly study patients be of the same gender, so to observe legal and Islamic ethics, the researcher used latex glove for applying acupressure and cryotherapy on all patients whether male or female (Rajaei et al. 2015). The obtained data were analysed using SPSS version 20. We performed the Chi-squared test, 1-way analysis of variance (ANOVA), the Fisher's exact test, repeated measures, and the Independent t-test.

3. Results

Findings showed that all study groups did not have significant differences as regards to age (Table 1), gender, educational degree, occupation, beliefs, type of operation, time passed from operation to the removal of the chest drain, and length of the chest drain tube. Furthermore, based on statistical analysis, no significant differ-

Table 1. Demographic characteristics of the elderly patients in 3 study groups.

Group	Variable	Acupressure	Cryotherapy	Control	Significance level*
		No.(%)	No.(%)	No.(%)	
Age(year)	60-62	35(70)	27(54)	25(50)	P=0.24
	63-65	8(16)	11(22)	16(32)	
	66-68	3(6)	8(16)	7(14)	
	69-71	4(8)	4(8)	2(4)	
Gender	Male	21(42)	23(46)	20(40)	P=0.82
	Female	29(58)	27(54)	30(60)	
Education	Under diploma	29(58)	31(62)	35(70)	P=0.44
	Diploma	21(42)	19(38)	15(30)	

*Chi-square test.

Client-Centered Nursing Care

Table 2. The intensity of chest pain in 3 study groups, 20 minutes before removal of the chest drain.

Group	Intensity of pain	Acupressure	Cryotherapy	Control
		No.(%)	No.(%)	No.(%)
	Without pain(0)	4(8)	4(8)	7(14)
	Slight(1-3)	29(58)	28(56)	26(52)
	Moderate(4-6)	17(34)	18(36)	17(34)
	Total	50(100)	50(100)	50(100)
	Mean±SD	2.84±1.96	2.98±2.14	2.98±2.15
	Result of analysis of variance		F=0.075	P-value=0.928

Client-Centered Nursing Care

Table 3. The intensity of pain in 3 study groups immediately after the removal of the chest drain tube.

Group	Intensity of pain		
	Acupressure	Cryotherapy	Control
	No.(%)	No.(%)	No.(%)
Slight(1–3)	13(26)	6(12)	0(0)
Moderate(4–6)	28(56)	21(45)	2(4)
Severe(7–9)	9(18)	23(46)	16(32)
The most intense pain imaginable(10)	0(0)	0(0)	32(64)
Total	50(100)	50(100)	50(100)
Mean±SD	4.48±2.01	5.86±2.20	8.96±1.59
Results of analysis of variance		F=69.04	P-value<0.001

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Table 4. The intensity of pain in 3 study groups, 15 minutes after removal of the chest drain tube.

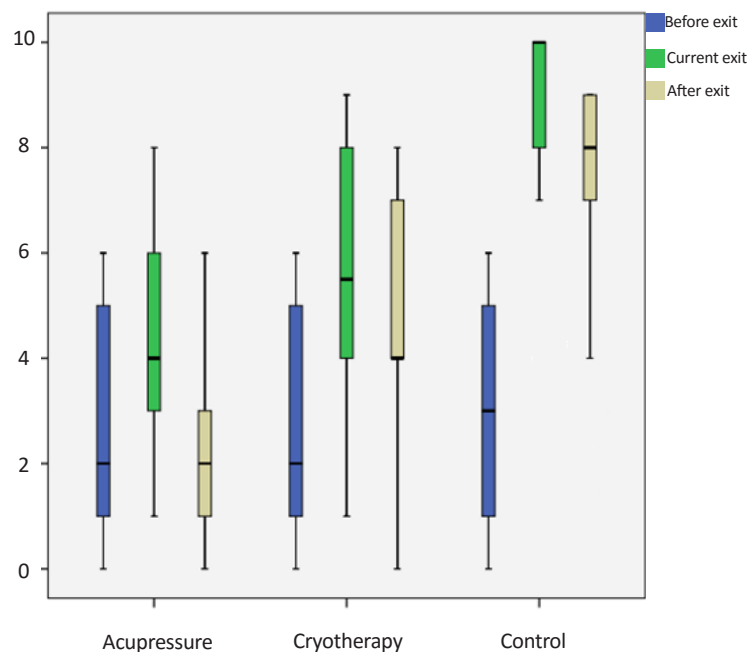
Group	Intensity of pain		
	Acupressure	Cryotherapy	Control
	No.(%)	No.(%)	No.(%)
Without pain(0)	8(16)	2(4)	0(0)
Slight(1-3)	36(72)	9(18)	5(10)
Moderate(4-6)	4(8)	20(40)	7(14)
Severe(7-9)	2(4)	19(38)	38(76)
Total	50(100)	50(100)	50(100)
Mean±SD	2.28±1.71	4.80±2.20	6.98±2.28
Results of analysis of variance		F=63.82	P-value<0.001

Client-Centered Nursing Care

ence existed among three study groups regarding the intensity of pain before the intervention ($P=0.93$).

However, regarding the evaluation of the three groups in terms of the pain intensity immediately after and 15 minutes after removal of the chest drain tube, the results of Scheffé test showed significant differences among three groups (Tables 2 and 3). In the acupressure and cryotherapy groups, the intensity of pain was less than that in the control group. Also, the intensity of pain in the acupressure group was less than that in the cryotherapy group and the difference was significant ($P<0.001$). None of the elderly patients in all study groups immediately after the removal of the chest drain tube were without pain. However, 15 minutes after the removal of the chest drain, none of the elderly study patients in all groups experienced the most intense pain imaginable (Tables 3 and 4).

Based on the study results, majority of the patients (56%) in the acupressure group felt moderate pain while many patients (46%) in the cryotherapy group felt intense pain, and most patients (64%) in the control group felt most intense pain imaginable (Table 3). In the acupressure and cryotherapy group, none of the elderly study patients experienced the most intense pain imaginable. These findings showed that the level of moderate pain in the acupressure group was more than that in the cold therapy group and the control group (56% versus 42% and 4%, respectively). However, the level of intense pain in the acupressure group was significantly lower than that in the cold therapy group and the control group (18% versus 46% and 32%, respectively). Table 3 compares the intensity of pain in all study groups. The Scheffé test shows significant differences before, immediately after, and 15 minutes after the removal of the chest drain tube (Figure 1).



Client-Centered Nursing Care

Figure 1. Intensity of pain in 3 study groups, 20 minutes before, immediately after, and 15 minutes after removal of the chest drain tube.

4. Discussion

The present study has been conducted with the general aim of comparing the effectiveness of acupressure and cryotherapy on the pain resulting from removal of the chest drain tube of the elderly patients who have undergone open heart surgery. Control of pain in patients after heart surgery is one of the common problems in ICUs (Barr et al. 2013). Failure to treat the pain would deeply affect the quality of life and can have physical, psychological, social, and economic consequences. If acute pain is not properly managed, it can affect immune and nervous systems, and may progress and become chronic. Untreated pain can increase the risk of developing atelectasis, respiratory infections, myocardial ischemia, stroke, heart failure, and thromboembolic diseases in the patient (King & Fraser 2013).

Apparently, use of a non-drug alternative (such as acupressure and cold therapy) with fewer side effects has always been appropriate in preventing postoperative pain. In this study, there were no significant difference in personal characteristics and type of illness, as well as in the intensity of pain before the removal of the drain tube among three study groups (Table 2). However, the Scheffe test results showed that there were significant differences among three groups (acupressure, cryotherapy, control)

with regard to the intensity of pain immediately after, and 15 minutes after removal of the chest drain tube.

In the acupressure and cryotherapy groups, the intensity of pain was lower than the control group. Also, the intensity of pain in the acupressure group was lower than the cryotherapy group and this difference was significant ($P < 0.001$) (Tables 3 and 4). Acupressure and cryotherapy were reported to be effective in other situations, too. Based on the intensity of pain in three groups, severe pain or the most intense pain imaginable was not reported in the groups before drain tube extubation (Table 2). However, immediately after removal of the tube, intense levels of pain with degrees of 7 to 9 and even 10 were reported in all groups (Table 3).

This finding is consistent with the results of another study reporting that the removal the chest drain is associated with severe pain (Hood et al. 2014). In other words, based on the study results, the most prevalent degree of pain (56%) in the acupressure group was moderate pain, while the most prevalent type of pain in the cryotherapy group was intense pain (46%), and the most prevalent type of pain in the control group was the most intense pain imaginable (64%) (Table 3). Furthermore, in the acupressure and the cryotherapy groups, none of the study patients experienced the most intense pain imaginable. These findings indicate that the level of moderate

pain in the acupressure group was more than that in the cryotherapy and control groups (56% versus 42% and 4% respectively). However, the level of intense pain in the acupressure group was significantly lower than that in the cryotherapy and control groups (18% versus 46% and 32%, respectively) (Table 3).

Using the Scheffé test, a statistically significant difference was observed in the mean pain intensity of the study patients ($P < 0.001$) immediately after removal of the drain. In other words, acupressure applied on points LI4, ST36, and P6 was effective in reducing pain after removal of the chest drain tube in the elderly patients, and with regard to the intensity of pain they showed significant difference compared to the cryotherapy and control groups. Considering the reports of significant pain (although of short duration) on removing the chest drain (based on the research done in the past decade) also its bad reputation as a painful procedure (Hood et al. 2014), no wonder that removal of the drain tube has been described as one of the most unpleasant memories experienced by patients during the postoperative period (Gorji et al. 2014) and in one study, patients have reported moderate to intense pain in this regard (Zisis et al. 2015). Therefore, our finding is considered as a positive outcome.

The highest level of pain, i.e., intense pain, was reported 15 minutes after removal of the chest drain tube by the control group (76%), while the level of intense pain in the cryotherapy group was 38% and in the acupressure group was 4%. Therefore, in the control group not only pain did not decrease, but in fact intense pain increased (76%). However in the acupressure group, 16% of samples were without pain, while in the control group no patient was free of pain, and in the cryotherapy group only 2% of samples had no pain. Based on the Scheffé test, statistically significant differences were detected in the mean pain intensity in the study patients 15 minutes after removal of chest drain tube ($P < 0.001$). In other words, in patients who received acupressure therapy at points ST36, LI4, and P6, the intensity of pain showed significant reduction compared with the other 2 groups 15 minutes after removal of the chest drain tube. Therefore, acupressure was able to reduce pain more at this stage.

Moreover, the degree of pressure applied on acupressure points and proper timing have decisive roles in reducing pain. In this regard, a high-frequency current activates special cells and through a byway triggers the endorphins producing system. In most cases high frequency current should be used for longer time because the duration of its effect is very short. On the other hand, low-frequency cur-

rents has low analgesic effect at the beginning, but their effects last longer, diffuse and relieve pain more, and often associate with drowsiness. The analgesic effect of low-frequency current rises during consecutive sessions and this phenomenon is due to enduring effect of endorphins triggered by low-frequency stimulation. In the long term, treatment with low-frequency current increases therapeutic effect (Jun et al. 2007).

Therefore, considering the study findings, applying acupressure on points SP6, LI4, and ST36 for 30 minutes can reduce pain immediately after removal of the chest drain tube and this phenomenon probably results from increase in the production of endorphins in the body. Likewise, in another study it has been concluded that the effect of interventions such as acupressure may include processes like stimulation of A delta fibers in the skin that reach the grey matter of the brain, inhibit pain stimulation and eventually reduce pain perception; activation of the enkephalins of brain neurons and inhibiting the transmission of pain to the brain; releasing endorphins and meta-enkephalins in the brain; activating pain relief system in midbrain; and affecting the central pain network in the hypothalamus and the limbic system (Ernst 2006).

Although our present study purpose was not to describe the neurophysiology of acupressure, but to examine the effect of acupressure and cold therapy in relieving or reducing pain caused by removal of chest drain tube in the elderly patients with open heart surgery, a constant presence at the patient's bedside to perform 30 minutes of acupressure has led to witnessing the positive results in the acupressure group. This factor can reduce anxiety and increase calmness in elderly patients. Moreover, our study results were consistent with the findings of Momenabadi (2010) study. Their study on 100 patients showed that the patients in the intervention group had significant reduction in the intensity of pain 15 minutes after application of acupressure as compared with the control group (Momenabadi 2010).

Dabiri and Shahi reported that no significant differences existed among the 3 groups of acupressure (at point LI4), touch therapy, and the control group with regard to the duration and the intensity of labor pain, 30 minutes, 1 hour after the intervention, and every hour later until the end of the first phase of labor. However, in the acupressure group compared with the other two groups, there was significant reduction in the intensity of pain after the intervention. This means that acupressure was more effective in reducing pain compared with the other two groups (Dabiri & Shahi 2014). This result is consistent with the our study

results. In this study, the LI4 acupoint was used for 30 minutes, which was one cycle of intervention.

Furthermore, results of [Karimipour et al. \(2011\)](#) study showed that there were no significant differences between the mean intensity of pain of the two study groups. Their results were not consistent with our study results. This inconsistency may be due to the type of pain (pain resulting from rheumatoid arthritis) and duration of performing acupressure intervention which was shorter than that in our study.

Another non-pharmacological procedure effective in control of pain is cryotherapy. Historically, therapeutic use of local or systemic cryotherapy was first described by Hippocrates ([Osunde et al. 2011](#)). After tissue damage, vasoactive agents such as histamine are released. These chemicals cause inflammation and leakage of fluid from blood vessels. Cryotherapy reduces inflammation through contraction of blood vessels and decreasing vasoactive agents of the damaged tissue. It alleviates pain by boosting the pain threshold through slowing down the conduction velocity of neural pathways. In muscle tissues, cryotherapy eliminates fatigue by reducing muscle spasm through reduction in the activity of muscle spindle and peripheral nerves. Muscle spasms decrease by cold through a mechanism that is not well understood. Prolonged cold application on muscle spindle seems to be one of the reasons for reduction of muscle spasm. Muscle stiffness and spasm increases as a result of increased tissue viscosity and reduced collagen stretching tissue. One should be careful that application of cryotherapy should not last longer than 15 minutes. Lengthy and excessive cryotherapy will lead to compensatory vasodilation rather than vasoconstriction and eventually increase in edema and tissue damage ([Jansen 2008](#)).

Cold stimuli can increase delta fibers in the skin blood flow, alleviates headache ([Weintraub et al. 2008](#)), and calms the nerves ([McCabe 2001](#)). Cryotherapy results in reducing discomfort and pain in the damaged tissue, suppresses edema, and increases the recovery of the affected area ([Andersen et al. 2015](#)). Cold reduces inflammation and muscle pain ([Salvo 2015](#)), as well as activity of nociceptive receptors resulting in increased vasoconstriction ([Scott & Fishman 2012](#)) and thus restriction of bleeding in the damaged area. It is also effective in reducing hyperthermia ([Andersen et al. 2015](#)). The aim of cryotherapy is to reduce pain, inflammation, and muscle spasm ([Foreman et al. 2010](#); [Jansen 2008](#)). [Al-Otaibi et al. \(2013\)](#) conducted a study on 40 patients hospitalized in the surgeries special ward. They demonstrated that cryotherapy had a significant effect on reducing pain and anxiety at the time the removing chest drain tube ([Zisis et](#)

[al. 2015](#)). Results of our study were consistent with this study. However, the duration of intervention in that study was shorter than that in our study.

Results of our study was consistent with results of the studies done by [Demir and Khorshid \(2010\)](#), [Mazloun et al. \(2012\)](#), and [Kol et al. \(2013\)](#). The reason for this consistency is application of cryotherapy for 20 minutes, because for obtaining the desired physiological effect of cryotherapy, it should be applied at least 20 minutes. Although in the study by [Mazloun et al. \(2012\)](#), ice pack and not cooling gel was used.

Our study results were similar to the findings of study conducted in 2014 by [Dehghan and Farahbod](#). Their study results showed that the intensity of pain decreased in both groups of heat therapy and cold therapy. However, in the heat therapy group this reduction was more ([Dehghan & Farahbod 2014](#)). Nevertheless, the study population and the type of pain in the two studies were different. Also, in their study, instead of cooling gel, ice pack was used.

The results of our study are in line with the study results of [Haynes in 2015](#). His study showed that in two groups of cryotherapy, applying ice prior to ABG test had led to more pain relieve compared with two control groups. However, the difference between two groups of cryotherapy and two control groups was not significant. This study recommended application of cryotherapy as a drug-free, simple, and effective procedure without side effects ([Haynes 2015](#)). The reason for this consistency can be related to 20 minutes application of cryotherapy, because for obtaining the desirable physiological effects of cryotherapy, at least 20 minutes of its application is necessary. However, in that study, ice pack was used (not cooling gel). Moreover, the study population and type of pain were different in two studies.

Results of a study by [Canbulat et al. \(2015\)](#) showed that application of cryotherapy accompanied with vibration stimulus was effective in reducing pain and anxiety arising during venipuncture ([Mirzamani et al. 2008](#)). Results of our study was consistent with this study, too. However, the study population were different in two studies. The results of the present study was not consistent with the study by [Witting-Wells et al. \(2015\)](#). They conducted an RCT (Randomized Controlled Trial) study on patients undergoing knee joint replacement. After carrying out cryotherapy intervention, they concluded that no statistically significant difference was seen between two groups of cryotherapy and control ([Wittig-Wells et al. 2015](#)). Reason for inconsistency may be due to different study populations and the type of pain in two study groups.

In addition, ice pack was used in that study. In a study by Khalkhali et al. (2014), the results indicated that the intensity of pain in the cryotherapy group was less than that in the control group and the difference was significant (Khalkhali et al. 2014). Results of our study are consistent with the findings of said study as regards the reduction in the intensity of pain. Such consistency is probably due to use of cooling gel by both studies to apply cryotherapy.

Results of a study by Heidari Gorji et al. (2013) conducted on 80 patients undergoing CABG at Mazandaran Province Heart Center Hospital, showed that there was no significant statistical difference among three groups as regards the intensity of pain after removal of the chest drain tube. However, the intensity of pain in the relaxation ice pack groups was lower than that in the control group (Gorji et al. 2014). Their results were not similar to our study results. However, in their study, the duration of cryotherapy was 10 minutes which was shorter than that duration in our study and they used ice pack instead of cooling gel.

With regard to studying the pain intensity immediately after and 15 minutes after removal of chest drain tube in three study groups (Tables 3 and 4), the results of Scheffe test showed that there were significant differences ($P < 0.001$) among three groups, i.e. the mean score for the pain intensity in the control group was higher than in other two groups. Also, there was significant statistical difference between acupressure and cryotherapy groups, and the mean score of the pain intensity was higher in the cryotherapy group. In other words, application of acupressure will reduce pain immediately after and 15 minutes after the removal of the chest drain tube.

Thus, considering the mean scores in the two stages (immediately after, and 15 minutes after the removal of the drain tube), the intensity of pain decreased in groups receiving acupressure and cryotherapy. The mean intensity of pain in the acupressure group was 2.1 before the intervention and reached 4.2 immediately after, and then 2.1 fifteen minutes after removal of the drain tube. While before the intervention, the mean scores of pain intensity in the cryotherapy group and the control groups were 2.2 and 2.2, respectively. Then, they reached 5.2 and 8.1, respectively immediately after, and 4.2 and 6.2, respectively 15 minutes after the drain tube removal. In general, the mean intensity of pain in the cryotherapy group decreased parallel to the pain intensity in acupressure group, thus the effectiveness of complementary medicine procedures such as acupressure and cryotherapy to reduce the intensity of pain should be acknowledged. However, the process of pain intensity reduction in acupressure group, considering its status before the

intervention and at different intervals, had significantly been better and more obvious than the process of pain reduction in the cryotherapy group.

Results of our study did not conform with Haji Amini et al. (2012) study results (Hajiamini et al. 2012) and research by Kaviani et al. (2012). The reason for the inconsistency may be due to the different study populations, type of pain, and the manner by which cryotherapy was applied (ice massage instead of cooling gel). Also, in the mentioned studies only the LI4 point was used, and in Haji Amini study, duration of intervention was 20 minutes which with regard to the number of acupressure points and duration of the intervention were shorter than that in our study.

In another study by Ghaemmaghami et al. (2012), they showed that the intensity of pain decreased in both intervention groups. However, significant decrease was reported only in the cupping therapy intervention group (Ghaemmaghami et al. 2014). The results of that study was inconsistent with our study findings. The reason for inconsistency may be due to the different complications studied, difference in the selected acupoints, duration of intervention, and the type of intervention procedure. However, the results of our study was in conformity with Sorour et al. (2014) study (Amany et al. 2014). That study showed that after the intervention, the acupressure group expressed significant decrease in pain compared with the other two groups (isometrics and control). However, the scores with regard to stiffness and physical disorder in the isometric group were significantly lower compared with the other two groups (acupressure and control). In general, there were no significant differences between the scores in the two groups. Although the study population and type of pain were different in two studies, it should be noted that duration of intervention in the above study was shorter than that in our study.

Based on the analysis of these findings, in the acupressure group, suppression of pain immediately after, and 15 minutes after removal of the chest drain tube can be due to effectiveness of acupressure applied on points ST36, LI4, and P6. Furthermore, results indicate that the intensity and duration of intervention (30 minutes) will suppress pain in the study patients and due to continuous stimuli of acupressure points, vital energy flow is augmented in the meridians and the therapeutic effects become effective. Although in analyzing this issue, limits of the study should be considered, too.

The novelty of these two procedures and lack of familiarity of the patients with them can be the source of some concerns, probably bewilderment, or even anxiety in the

elderly patients, and affect the results. In this study, for preventing such concerns, the researcher and the head nurse (or the nurse worked in that ward) explained the safety and method of application of the procedures to the patients, so that these concerns be controlled to some extent.

Another limitation of this study is the different pain thresholds in various individuals. Such differences can be due to individual characteristics, cultural and social factors, as well as economic status and even the gender. Therefore, the intensity of pain may be expressed more than its real values. This is a kind of limitation that to some extent its management is beyond the researcher's control. Although by including the control group in our study, this limitation is somewhat resolved. Another limitation of this study relates to the skill and professional experience of the person in charge of removing the drain tube. It is one of the important factors involved in the intensity of pain during removing the chest drain. In our study, the patients were divided among four trained nurses of the medical ward who had sufficient proficiency and experience in this regard and therefore to a great extent, the said limitation was under control.

Because, this study was limited to patients who had undergone open heart surgery, its results cannot be generalized to all patients with had drain tubes (for reasons other than heart surgery). Also, the sampling method was non-random and can limit the external validity of this study. However, all operations were performed by one surgeon so that the difference in handling the tissues was minimized. Thus, we can assume that the differences in pain relief is only confined to the effectiveness of relief measures. Despite the mentioned limitations, this study has enriched the current literature regarding description and critical analysis of non-pharmacological interventions and potentially is effective for the elderly patients.

Acupressure points LI4 and P6, which have been used in this study are conveniently accessible. Because of ethical and cultural issues in our country, many women believe and insist on protecting their privacy and cover, so application of acupressure on the mentioned points had no contradiction with patients' cultural beliefs. Accordingly, these acupressure points are recommended due to their ease of access. The other point, i.e. ST36 requires a private environment so that it would lead to further cooperation of patients. In this research by using partitions this privacy was provided. Another strong point of our study was the equal time used for applying acupressure for each participant. Also, comparing the intensity of pain in two intervention groups (acupressure, cryotherapy) with a control group to measure the effect

of control can be considered among the strong points of this study. In order to prevent bias, application of pressure was performed by one person.

Findings of this study can be important because of the attention paid to non-pharmacological measures in reducing pain due to removal of chest drain tube. It is recommended that application of acupressure be taken into account in clinical practice. In this regard, nurses should be trained through in-service training courses that can be included in their curriculum. It is also recommended that nurses during the patients' cares, allocate some time for applying this procedure or even teach it to the patients. Directors of medical centers can provide training and put this simple and low-cost care in care planings and nurses' duties. This technique needs minimum facilities and without imposing additional costs on patients and treatment centers, reduce the intensity of pain experienced in these patients, and increase the quality of care considering the application of acupressure in a wide range of complications. Nurses, also, can teach acupressure and cryotherapy procedure to the patients' caregivers or their family to perform those tasks when it needed.

Application of acupressure and cryotherapy can reduce the consumption of sedatives and painkillers and consequently side effects of these drugs. It saves high costs of medication and medical advice for relief and control of pain. This is possible when suitable planning is carried out in this regard. Because the present study was conducted on elderly patients undergoing open heart surgery, we suggest that in future studies, the effect of acupressure be examined on reducing pain caused by other illnesses or operations on elderly patients.

Results of this study showed that the intensity of pain during removal of chest drain tube in the elderly patients undergoing open heart surgery decreased in both intervention groups (acupressure and cryotherapy). However, in the acupressure group, significant reduction of pain was reported. Acupressure applied on points ST36, LI4, and P6 seems to be an effective method for reducing pain caused by removal of chest drain tube in the elderly patients and is recommended as a safe, nonpharmacological, and inexpensive procedure to control pain.

Based on the review of the articles related to the present study, the research findings supported the application of traditional medicine for treatment of illnesses and so far no severe complications have been reported. Points LI4 and P6 used in this study were easily accessible. In our country, women believe and stress on protecting their privacy and cover; however, administration of

cryotherapy and acupressure on those points was not in contradiction with their cultural beliefs. Therefore, using those points is recommended because of their easy access. The other point, ST36, needs a private place to entice patients' cooperation.

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Conflict of Interest

The authors declared no conflict of interests

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The Effect of Self-Management Training Using CD on the Quality of Life in Patients with Chronic Heart Failure



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ABSTRACT

Background: Chronic heart failure (CHF) can have negative effects on the quality of life (QoL). Self-management education is one of the approaches that can be adopted to increase the QoL of these patients. This study aimed to determine the effect of self-management training using compact disc (CD) on the QoL in patients with CHF.

Methods: This study was a non-randomized controlled clinical trial which was conducted on 74 patients with CHF hospitalized in Shahid Rajaie Cardiovascular medical and research center in 2015. Research samples were selected with convenience sampling method and randomly assigned to intervention (training with CD) and control (conventional training) groups. To collect data, Iranian questionnaire to assess QoL in patients with heart failure (IHF-QoL) was completed in both groups before and 3 months after the intervention. Data analysis was done using statistical tests of the Independent t test and paired t-test using SPSS version 21.

Results: According to the findings, there was no significant difference between two groups before the intervention with regard to QoL scores ($P=0.58$). Statistical tests showed that 3 months after the intervention, self-management education promoted QoL subscales including psychological status ($t=-2.578$, $P=0.012$), self-care ($t=-3.633$, $P=0.001$), as well as total QoL ($t=-2.01$, $P=0.048$) in patients in the intervention group as compared with the control group. Also in CD method group, the mean scores of total QoL and its subscales before the intervention were significantly different from that mean scores 3 months after the intervention., i.e. their total QoL and its all subscales improved after intervention. ($P<0.0001$).

Conclusion: As self-management training with CD can improve QoL in patients with CHF compared with conventional training method, it is suggested that this training method be considered as a part of patients' self-management education by nurses with the aim of improving QoL.

Keywords:

Chronic heart failure,
Compact disc, Quality
of life, Self-management
training

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1. Background

Hear failure is a complex clinical syndrome that may be due to any disturbance in structure or function of the heart. Chronic heart failure (CHF) is the inability of the heart to meet the body's metabolic needs (Tissot et al. 2014). Patients with CHF have low quality of life (QoL) due to the multiple physical and mental disorders (Heidarzadeh et al. 2012). CHF has impact on all dimensions of life and can reduce QoL in every aspect. Thus, it is very important that the patient can manage these problems him/herself (Smeulders et al. 2010; Heo et al. 2009).

Self-management is one of the interventions that can be used in chronic diseases, including CHF to improve QoL and reduce symptoms and hospitalizations. Self-management comprises measures taken with the aim of raising patient's awareness to promote his or her participation in chronic disease management, in particular monitoring of symptoms, and changing in health behaviors (Jonkman et al. 2014). In self-management, person is actively responsible for treatment and management of the daily symptoms and has a key role with respect to newly developed signs, performing interventions, disease management, and making informed decisions. Generally, the responsibility of the people increase in the face of public health.

Efficient self-management boosts individual's abilities and reactions which persuades patients in respect of long-term observance of the principles taught, promotion of individual participation, and reducing hospitalization of cardiovascular patients. Studies indicate that intervention-based self-management can enhance self-care and QoL (Baljani et al. 2012; Rezasefat et al. 2014; Tung et al. 2013).

By optimizing self-management behaviors in patients, nurses can help them in optimal control of symptoms. They promote the abilities of patients and encourage them to do what has learned (Hoffman 2013). Self-management behaviors must be presented to patients by nurses using appropriate teaching methods. Training can be provided in different ways in which lecture is the most common method and by using good content and lecturer, we can obtain positive, reasonable, and appropriate outcomes from this method.

There are many obstacles to develop self-management in patients, but new self-management educational programs, including the use of CD have the potential to overcome these obstacles and have a useful role to change patients' behaviors and decisions. Actually, such programs allow patients to meet their educational needs without being present in treatment centers, and reduce the cost of individual treat-

ments, and finally improve self-management behaviors in patients (Dorn et al. 2014). Aghvami et al. (2015) study showed that not only the content of education was effective in improving QoL, but the manner of its presentation had important role in its results, so that teaching via CD was more effective on QoL in old 8-12 years children with asthma, compared with group educational method. Also Speck et al. (2016) showed that e-learning for 6 weeks can improve asthma control and enhance the QoL in patients with uncontrolled asthma. This study was conducted to determine the effects of self-management training program with CD on the QoL of the patients with CHF.

2. Materials & Methods

This research was a part of a non-randomized controlled clinical trial. It was conducted on patients with CHF admitted to Rajaie Cardiovascular medical and research center, Tehran, Iran in 2015.

Study patients

After the permission of the Vice Chancellor for Research and Ethics Committee of Iran University of Medical Sciences (107/105/D/94) as well as authorities of Shahid Rajaie Cardiovascular medical and research center, the researcher referred to the research setting and relevant wards to select patients with CHF who met the inclusion criteria. After explaining the study purpose to the patients and their agreement to participate in the study, they signed written informed consent forms. Patients were assured regarding the confidentiality of their information, their freedom to decline cooperation and exiting from the study without making any problem in their treatment and care process.

The subjects were selected by convenience sampling method. Then, they were assigned in the intervention (CD method) and control groups by simple randomization. The name of groups (CD and control) was written on cards and were placed in a sealed envelope. At the beginning of each week and before encountering with the patients, by taking an envelope from the box, the researcher specified that patients who would be enrolled in each group. Samples, then, were selected for that group. After ensuring the discharge of the sampled patients, recruitment to select the next group was done.

Inclusion criteria were as follows; confirmed diagnosis of heart failure by physician, not being in acute phase of the disease, no sensory-perceptual problems, ability to communicate and literacy, as well as ability to use computers by the patient or a family member in the intervention group. To determine the required sample

size at 95% confidence interval, power of 80%, and assuming that the effect of CD method of training on QoL in patients with CHF has statistically significant difference of at least 7 ($d=7$) with the control group and deviation in QoL is 10 according to the study of [Tung et al. \(2013\)](#), study sample size was calculated by the following formula:

$$n=(Z_{1-\alpha}+Z_{1-\beta})^2 \times 2s^2/d^2$$

Accordingly, each group had 32 subjects. With 25% drop out rate in each group, the sample size was considered 40 (Total sample size=80). Due to unwillingness of some patients to continue participation in the study, 6 people dropped out. Thus, 38 and 36 patients in the intervention group and control group, respectively were finally studied.

Data collection

In the current study, two questionnaires were used:

1) A demographic form: This questionnaire included questions about age, gender, educational degree, marital status, history of underlying disease, BMI, heart ejection fraction, duration of disease, the severity of disease due to heart failure, history of the disease family, number of children, income status, and medicines taken. This form was completed before the intervention by checking patient's file or asking the patients.

2) Iranian questionnaire to assess QoL in patients with heart failure (IHF-QoL): The questionnaire was developed by [Naderi et al. \(2012\)](#) and comprised 16 questions that examined physical symptoms such as shortness of breath, fatigue, peripheral edema, sleep disorder; psychiatric symptoms such as depression and anxiety; patient's social, physical, and sexual activity, as well as work, and emotions. Questions 1, 2, 3, 4, and 6 investigate symptoms and their severity, question 7 which has 4 parts investigates the patient's physical limitations, questions 8, 10, 12, and 13 investigate social interference, questions 5, 9, and 11 investigate psychiatric conditions, questions 14 and 15 investigate the knowledge and self-efficacy and question 16 investigates life satisfaction of patients. The questions are scored according to Likert-type scale in which the larger the number, the better would be the patient's condition. Summing the total score of questions results in the total QoL score in which scores ranges from 15 to 63. Lower scores indicate poor QoL and higher total scores show better QoL. The Cronbach's α coefficient for IHF-QoL is 0.922. And correlation coefficient tests were reported to be significant before and 3 months after the intervention (from 0.708 to 0.883; all P-values<0.001)

which was indicative of reliability of the questionnaire ([Naderi et al. 2012](#)). In this study, the Cronbach's α was 0.89 which indicated internal consistency of the tool.

Demographic questionnaire and IHF-QoL questionnaire were completed by subjects (CD method and control groups) before implementing the educational program. Also 3 months after the study, subjects (of both groups) were asked to attend the hospital to control the treatment process and complete the IHF-QoL.

Intervention

In the intervention group, including the patients and their family member were taught how to use the CD in one session for 20-15 minutes. They were asked to use the CD at home after discharge with the help of their families in the 3 months period. Educational content of CD included anatomy and physiology of the heart, introducing CHF, risk factors, symptoms, managing the symptoms of the disease, diagnostic solutions, diet, proper exercise, medication and side effects, blood pressure control method, and the calculation of body mass index.

These topics were stored in the CD as PowerPoint slides, training videos with subtitles in Farsi, related photos, and the full text of the training manual. Included in the CD were also applications necessary to run video, photos, PowerPoint, and the text. Patients in the intervention group were called by phone for 2-5 minutes in 1, 2, and 3 months after discharge. These conversations aimed at reviewing and emphasizing their use of the CD. Control group only received routine training. After collecting the information, content and educational CDs were delivered to patients in the control group, too.

Data analysis

To analyze the data, descriptive and inferential statistics including paired t-test for within-groups comparison, the Independent t-test for between-groups comparison, the Chi-squared, and Fisher's exact test to compare qualitative variables between two groups, were used. All analyses were done by SPSS version 21. Significance level was also considered to be less than 0.05.

3. Results

This study was conducted with the aim of investigating the effect of self-management training using CD on the QoL of patients with CHF. The demographic characteristics of the subjects suggested that the most frequently observed age group in the control and CD method groups

Table 1. Demographic characteristics of the patients with CHF in the control and intervention groups.

Variable		Control group (n=38) Mean±SD or % (No.)	Intervention group (n=36) Mean±SD or % (No.)	P-value
	Age, y	51.60(15.29)	44.05(13.16)	0.026
Gender	Male	50.00(19)	47.20(17)	0.81
	Female	50.00(19)	52.80(19)	
Marital status	Single	10.50(4)	13.50(5)	0.89
	Married	84.20(32)	80.61(29)	
	Widow	5.20(2)	5.62(2)	
Income	Sufficient	42.10(16)	44.40(16)	0.03
	Somewhat sufficient	26.30(10)	5.60(2)	
	Not sufficient	31.60(12)	50.00(18)	
Job	Unemployed	10.50(4)	13.90(5)	0.85
	Housewife	36.10(13)	39.50(15)	
	Employee	10.50(4)	16.70(6)	
	Self-employment	21.11(8)	11.10(4)	
	Retired	5.33(2)	8.30(3)	
	Others	13.20(5)	13.91(5)	
Smoking	Yes	7.90(3)	13.91(5)	0.29
	No	71.10(27)	77.82(28)	
	Quit smoking	21.10(8)	8.33(3)	
Exercise	Yes	52.63(20)	50.00(18)	0.80
	No	47.42(18)	50.00(18)	
Family history of the disease	Yes	50.00(19)	33.30(12)	0.14
	No	50.00(19)	66.75(24)	
Education	Elementary	10.50(4)	8.36(3)	0.19
	Under diploma	47.41(18)	25.00(9)	
	Diploma	26.32(10)	28.90(14)	
	Higher education	15.80(6)	27.81(10)	
Heart failure stage	I	00.00(0)	00.00(0)	0.33
	II	55.29(21)	50.00(18)	
	III	34.20(13)	47.20(17)	
	IV	10.50(4)	2.81(1)	
Cause	Ischemic	52.61(20)	33.30(12)	P=0.09
	Non-ischemic	47.40(18)	66.73(24)	
	Ejection fraction, %	30.92(8.96)	31.47(8.07)	P=0.78
	BMI, kg/m ²	24.30(5.32)	23.86(6.29)	0.04

was 40–49 years and the statistical results showed that two groups were not matched in terms of age. The results showed that proportion of male to female patients in the control group was 1:1 but the number of males was higher in the intervention group (n=19). In both groups, most of the subjects were married and housewives, also the majority did not smoke cigarette. With regard to educational

degree, most individuals in the control group were under diploma (47.4%) and in the CD method group, the highest frequency belonged to diploma holders (28.9%). Frequency distribution and percentage of income in patients showed that the most frequent option in the control group was “sufficient” (42.1%) and in the CD method group was “not sufficient” (50%). In this respect, two groups were

Table 2. Comparison of QoL scores in patients with CHF in control and CD method groups before and 3 months after self-management training.

Groups		CD Method (n=36)	Control (n=38)	Independent t-test results
Variables		Mean(SD)	Mean(SD)	
Symptoms and their severity	Before the intervention	11.50(3.29)	10.28(3.47)	t=1.00, P=0.320
	After the intervention	13.75(2.93)	12.78(3.32)	t=-1.31, P=0.19
	Paired t-test results	t=7.2, P<0.001	t=-1.4, P=0.14	
Physical limitations	Before the intervention	8.97(2.50)	9.34(2.26)	t=0.66, P=0.507
	After the intervention	9.80(2.32)	9.63(2.04)	t=0.34, P=0.73
	Paired t-test results	t=-4.3, P<0.001	t=-1.2, P=0.214	
Social interference	Before the intervention	9.44(1.91)	9.42(1.42)	t=-0.60, P=0.953
	After the intervention	10.27(1.50)	9.86(1.57)	t=-1.41, P=0.25
	Paired t-test results	t=-5, P<0.001	t=-2.8, P=0.008	
Psychological status	Before the intervention	6.33(1.56)	6.10(1.55)	t=-0.62, P=0.532
	After the intervention	7.41(1.38)	6.65(7.21)	t=-2.57, P=0.012
	Paired t-test results	t=-4.3, P<0.001	t=-2.6, P=0.012	
Self-efficacy and knowledge	Before the intervention	3.38(1.37)	3.44(1.26)	t=-0.67, P=0.850
	After the intervention	4.16(0.81)	3.39(1.00)	t=-3.63, P=0.001
	Paired t-test results	t=-4.1, P<0.001	t=0.29, P=0.722	
Life satisfaction	Before the intervention	2.50(0.73)	3.00(0.56)	t=-0.67, P=0.50
	After the intervention	2.66(0.47)	2.18(0.69)	t=-3.41, P=0.001
	Paired t-test results	t=-1.7, P=0.083	t=1.7, P=0.088	
Overall QoL	Before the intervention	39.63(7.76)	40.60(7.38)	t=0.54, P=0.58
	After the intervention	45.41(6.42)	42.34(6.71)	t=-2.01, P=0.048
	Paired t-test results	t=-1.80, P<0.001	t=-2.8, P=0.007	

not homogeneous but the statistical results showed that this variable was not a confounding variable in the study. Both groups were homogenous in terms of having a regular exercise program and a history of the disease. In terms of the classification of heart failure according to the New York Heart Association (NYHA), patients in both groups were in class II of heart failure (Table 1). According to statistical tests, none of the demographic indicators were confounder in the test results.

The results of the Independent t-test showed that QoL and its subscales in patients with CHF had no significant difference in both groups before the intervention ($P=0.58$). However, after 3 months the control and intervention groups showed statistically significant differences ($P=0.048$) with regard to QoL scores. In other words, intervention improved the QoL of patients with CHF. Furthermore, after 3 months of intervention, QoL scores in subscales of psychological status ($P=0.012$), life satisfaction ($P=0.001$) and self-efficacy and knowledge ($P=0.001$) were significantly different between the intervention and control groups and have been improved. However, in other subscales no significant differences were observed between two groups (Table 2).

Based on the paired t-test results in the control group, QoL showed significant change after 3 months ($P=0.007$). Furthermore, the results of this test showed that in the intervention group there was a significant difference in terms of QoL 3 months after the intervention compared to the time before the intervention ($P<0.001$) and QoL has been improved. In reviewing various aspects of QoL in the intervention group, the statistical results of paired t-test showed that after 3 months, QoL scores of patients in all subscales (symptoms of heart failure, economic, social, psychological status, self-efficacy and knowledge, and daily activities of the individual) have been improved ($P<0.001$). With regard to different subscales of QoL in the control group, the statistical results of paired t-test showed that after 3 months of entering to the study, QoL scores of people in socio-economic ($P=0.008$) and psychological status ($P=0.012$) subscales significantly changed and QoL improved in these areas. However with regard to other subscales, no significant changes were observed in the control group before and 3 months after the start of the study (Table 2).

4. Discussion

Based on our findings, self-management education with CD method has improved QoL of patients with CHF compared with the control group. In line with the results of this study, [Tung et al. \(2013\)](#) showed that self-management

training had a positive impact on QoL of patients with CHF compared with the control group. Likewise, [Shu-Hui et al. \(2014\)](#) conducted a study to investigate the effect of self-management training on QoL of patients with chronic obstructive pulmonary disease (COPD). They reported that self-management programs resulted in improvement of QoL through shortening the acute phase of the disease and its recurrence. [Baljany et al. \(2012\)](#) addressed the effect of self-management by increasing patients' awareness on the medicines adherence and changing lifestyle of patients with cardiovascular disorders.

However in a review study, out of 19 studies reviewed, in 5 studies, self-management training had no effect on QoL of patients with CHF. Nevertheless, the methodological limitations of the studies evaluated in this review could be the cause of insignificant effects of the intervention on QoL. Self-management interventions are part of a multifaceted CHF intervention program and patients' education is a key component of self-management, which its teaching is necessary to create awareness of the signs and symptoms, lifestyle changes, and adherence to treatment ([Ditewig et al. 2010](#)). In this regard, there are different methods of education with various effects on QoL. One can argue that compared to the conventional methods, like face-to-face training and giving educational pamphlets, using educational CDs could improve QoL education. Also according to the findings in CD method group, QoL in patients with CHF after 3 months of training have had a significant improvement, compared with their QoL before the training period.

Mean score of QoL in these patients was improved after the training. In line with this study, [Strömberg et al. \(2006\)](#) showed that computer-based training such as using educational CD compared with conventional methods could promote knowledge, change the behavior, and improve self-care in patients with CHF. However, [Dilles et al. \(2011\)](#) in a study comparing the effects of two educational methods of using the educational CD and conventional method on self-care and knowledge of the patients with CHF showed that both methods can improve the level of knowledge and self-management of the hospitalized patients with CHF. Nevertheless, there was no significant differences between 2 groups with regard to knowledge ($P=0.65$) and self-care ($P=0.40$), and it cannot be concluded that educational CDs can be used as an alternative to traditional training methods. Also in the current study, it was found that both conventional and CD methods improved the QoL compared with pre-intervention period; however, this improvement was higher in the intervention (CD method) group.

Comparing two groups, 3 months after the intervention, revealed that, self-management education with CD improved QoL (compared with the control group) in these subscales: symptoms of heart failure, socio-economic and psychological status, daily activities, self-efficacy, and knowledge. However, these differences were statistically significant only in the areas of socio-economic status, self-efficacy, and knowledge.

Also with regard to within group comparison, the results showed that in the control group, an improvement was observed in the socio-economic status and consequently, in total QoL, 3 months after the study. However, this socio-economic improvement was higher in the CD method group after 3 months of intervention. Similarly, another study reported that self-management education programs can play an effective role in the economic status of patients with COPD by reducing the cost of readmission and also the number of patients admitted to hospital (Bourbeau et al. 2006). The results also showed that 3 months after the intervention compared with the pre-intervention period, QoL improved in all aspects of QOL in the intervention group.

In another study, it was shown that limitations in physical activities, mental disorders such as anxiety, and lack of knowledge about the disease can negatively affect QoL of these patients and it was proposed that the patient education be done to alleviate these problems (Malhotra et al. 2016). Similar to our study which indicated the QoL improvement in the psychological aspect, McCorkle et al. (2011) reported that self-management training in patients with cancer could improve the management of the symptoms and reduce their anxiety and psychological problems in different courses of treatment and even after treatment, and consequently enhance patients' QoL. One of the problems in patients with heart failure is limitations in physical activity. With regard to the QoL aspect of individual's daily activities, the mean(SD) score in the control group (which has been provided with conventional self-management training) promoted significantly from 9.34(2.26) to 9.63(2.04). Likewise, in the intervention group, daily activities mean(SD) scores improved significantly from 8.97(2.50) to 9.80(2.3).

In line with these results, a study showed that life style of patients with CHF can be changed using different teaching methods and improving physical activity of these patients can prevent worsening of the disease and their restrictions (Dontje et al. 2014). In self-management teaching group using CD, the mean(SD) score of self-efficacy and knowledge subscales improved from 3.38(1.37) to 4.16(0.81). Similarly, a study with the aim of comparing the computer-assisted training (using CD, including

contents such as videos, photos, etc.) and education using standard methods (giving brochures and face-to-face training) on patients with heart disease showed that the level of knowledge and self-care in patients with CHF improved with both methods, but there was no significant difference between the two methods in terms of impact on self-care and self-efficacy (Dilles et al. 2011). de Walt et al. (2006) also reported that patients with CHF who were taught with different educational methods performed more self-care control behavior over their daily weight compared to the patients in the control group. Also in their study, Strömberg et al. (2002) concluded that in CD method group, training with CD increased patients' knowledge, self-care, and self-efficacy compared with the control group.

Among the limitations of this study was impossibility of blinding because of the nature of the intervention. Other limitation was failure to use block randomization method in sample selection. Also the impact of the intervention was evaluated in a 3-month period which is not long enough. We recommend that future studies be conducted with the aim of investigating the effects of long-term self-management training with CD on these patients. To determine the most suitable training approach, we suggest that different methods of teaching and their effects on QoL and self-management behaviors of these patients be compared. In this study, in addition to giving educational CD, telephone calls were made to be ensured of using CD. This was not done in the control group. Although in these calls, we tried only to emphasize the use of the CD, a study should be conducted with three groups under the conventional training and telephone follow-ups to ensure implementation of training tips to obtain the net effect of education considering follow-ups.

In this research, the effect of self-management training with CD on the QoL of patients with CHF was investigated. Research results showed that self-management education using common methods (face-to-face education and providing an educational pamphlet at the time of discharge) and CD-based educational can increase QoL of patients with CHF. The results showed that education with CD in the intervention group has led to more improvement in QoL of patients with CHF, compared with the control group. Self-management education is an appropriate way to improve QoL in patients with CHF and these trainings enhance the skills of patients to manage disease on their own. One important finding of this study was the role of modern methods of training in further improvement of QoL in patients. It is recommended that caregivers, especially nurses use educational CDs along with common methods in training patients with CHF. Furthermore, we

propose that a useful teaching method of self-management to patients with CHF should be included in nursing curriculum at health care centers and universities. By teaching with modern methods like CDs to nurses and nursing students, a step is taken towards promoting self-management and QoL in patients with CHF.

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Conflict of Interest

The authors declared no conflict of interests.

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Study of the Stature Structure of 10-12 Years Old Female Students in Selected Elementary Schools in Tehran



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ABSTRACT

Background: One of the common problems in early adolescence is skeletal disorders which has an international dimension to the extent that structural and postural abnormalities screening programs are in schools agenda in different countries for years. This study aimed to determine skeletal structure of female students aged 10 to 12 years in Tehran.

Methods: In this cross-sectional study after using cluster random sampling method, 283 students in fourth and fifth grades registered in academic year 2013-2014 were recruited. We investigated the skeletal structure of them by body analysis software, their demographic information by a questionnaires and their anthropometric characteristics by using standard scale. The obtained data were analyzed through descriptive statistical tests, the Chi-square test, and Kendall correlation coefficient using SPSS version 19.

Results: About 6% of students (n=17) had no skeletal disorder and the rest suffered from at least one problem. Two students (0.7%) suffered from 7 disorders simultaneously. The highest percentage of obesity (39.7%) was seen in 12 years age group and the most frequent underweight (8.2%) was observed in 14 students in the age group of 10 years. About 1.8% of subjects (n=5) suffered from forward head disorder. Also, 5.7% of children (n=16) suffered from hallux valgus. The Chi-squared statistical analysis showed that there is a significant relationship between hallux valgus disorder and age (P=0.001). Finally, 20.1% of children suffered from flat foot and 22.6% of them had high foot arch.

Conclusion: The majority of female students in Tehran suffered from at least one or two stature and skeletal abnormalities. The timely detection of the problem can prevent the progress and complications of these disorders.

Keywords:

Stature, Female students, Skeletal disorders

1. Background

B

ody quality and physical structure are of particular importance to humans. Body

changes and deformities will affect human health so that the consequences of incorrect posture on the mental, physical, and economic aspects are worthy of investigation (Rahimi & Hassanpour 2007). Stature structure con-

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nects different body parts with the center of gravity and in terms of the orthopedics, it is an index that determines mechanical efficiency of the neuromuscular system. By definition, a good stature maintains skeletomuscular balance to protect the body elements against injuries or progressive distortion. This status holds in all situations whether the body is resting or performing activities. A common problem in early adolescence is skeletal disorder, which has international dimension to the extent that structural and postural abnormalities screening programs are in the agenda of schools in different countries for years (Rahnama et al. 2010).

Common abnormalities include uneven shoulder, forward head, tilted shoulder, lordosis, kyphosis, valgus deformity, knee parenthesis, flat foot, and scoliosis (Akbar-fahimi et al. 2009). According to studies, the most obvious problem following structural abnormalities of stature in the students is pain. Based on the reports, the prevalence of pain in students due to musculoskeletal disorders in different organs is between 2.9% and 18.9% (Shamsedini et al. 2011). Numerous studies also investigated the cost effectiveness of these problems which further emphasizes the need for screening programs in schools.

Experts believe that on average, each Iranian student suffers from at least one or two stature problems such as hyperlordosis, parenthesis legs, and abnormal curvature of the spine. Thus, more attention should be paid to these disorders and prevent their occurrence as far as possible (Saneh 2009). Previous studies have also shown that delay in diagnosis and timely treatment of musculoskeletal disorders can lead to physical and psychological effects in girls more than boys (Danielsson et al. 2010; Payne et al. 1997). Review of studies conducted in Iran showed that despite the specific importance of the subject, a few studies have been conducted on this population. Considering the above issues, the current study was conducted to evaluate the structure of stature and its relationship with some demographic characteristics of female school students in Tehran, Iran.

2. Materials & Methods

This study was a cross-sectional and descriptive study. After approving the project by Ethics Committee of Iran University of Medical Sciences, and selection of the samples, written consent forms were obtained from their parents and verbal consent obtained from children. According to Education and Training organization in the West of Tehran, 35000 students study in Tehran elementary schools, 46% of them are girls who are studying in 110 urban schools. The required sample size comprised

280 students, calculated according to the study power of 80 and a significance level of 0.05.

By referring to the Education and Training Organization of Tehran, a list of elementary girl schools was extracted. Then, 10 schools in different parts of the West of Tehran (2, 3, and 6 districts) were selected and out of them, students of 10 to 12 years old were selected by cluster random sampling method. The skeletal structure of these students were evaluated using body analysis software, which was the main study tool. After taking participants' digital photos from three angles of front, side, and rear and marking different parts of the body by the researcher, photos were input to the computer and by connecting the marker lines, this software reported the degree and severity of each defect.

It also uses the Libra balance which includes a steel bar with two parallel bars and a measuring meter to measure the height and weight of each student. To reduce human error in measurements, simultaneous observation and measuring of the subjects was done with the help of two researchers. As body mass index (BMI) is an important indicator of the health in children and predictive criterion in skeletal disorders, we used the CDC (Centers for Disease Control and Prevention) standards to determine BMI. Calculation of this index in children can be gender-specific. The second part of the information i.e., the demographic characteristics was collected using a questionnaire and results of which were analyzed using descriptive statistics with SPSS version 16.

3. Results

The demographic characteristics of 283 students participating in the research and their anthropometric characteristics are presented in Table 1. Based on BMI results, 27.6% of students (n=76) had overweight and 9.2%(n=26) suffered from underweight. According to the CDC standards, the highest percentage of obesity was 39.7% in the 12 years old age group and the most frequent underweight (8.2%) were in the age group of 10 years old. About 1.8%(n=5) of children suffered from forward head, and 8.1%(n=23) suffered from drooping shoulder. Also, 5.7%(n=16) of children, suffered from hallux valgus. The Chi-squared test showed a significant relationship between hallux valgus and age group (P=0.001). About 20.1% of children suffered from the flat foot and 22.6% from high arch foot. Kendall test showed a significant relationship between BMI and flat foot in subjects (P=0.000) (Table 3).

As Table 2 shows, the highest prevalence of lumbar disorders in all study groups belonged to lordosis (17.3%) and the least disorder was kyphosis (2.5%). Knee disorders in girls under study was lower than most other

Table 1. Anthropometric indices of female students in selected school districts in Tehran in 2013.

Variable	Min	Max	Mean	SD
Age, y	10	12	11.24	0.587
Weight, kg	20	85	38.57	10.213
Height, cm	125	166	142.3	7.981
BMI, kg/m ²	11.4	34.5	18.80	3597.0

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Table 2. Distribution of lumbar disorders in female school students in selected schools of Tehran in 2013.

		Posture of spinal cords				
Age, y		Normal	Scoliosis	Kyphosis	Lordosis	Total
10	No.	13	0	0	10	23
	%	56.5	0	0	43.5	100
11	No.	126	15	5	24	170
	%	71.4	8.8	2.9	14.1	100
12	No.	69	4	2	15	90
	%	76.7	4.4	2.2	16.7	100
Total	No.	208	19	7	49	283
	%	73.5	6.7	2.5	17.3	100
		$\chi^2=1.65$	P=0.018	df=6		

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Table 3. The relationship between demographic characteristics and structural disorders of stature in 10-12 years old female students in 2013.

Variable		P-value	df	Statistical test
Hallux valgus	Age	0.004	2	$\chi^2=11.003$
Flat foot	BMI	0.003	109	F=1.58

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disorders, so that 0.7%(n=2) had valgus deformity and 1.8%(n=5) had parenthesis knee.

4. Discussion

This study is the first comprehensive skeletal screening using the organ analysis software which showed various skeletal disorders in 10-12 years old girls in Tehran, Iran. According to the results, only 6% of students (n=17) had no disorder and the rest of students had at least one

disorder. Two students suffered from 7 disorders simultaneously. In a similar study in Belgrade conducted on the same age group, 76% of students had no disorder (Petrović et al. 2012). Comparing the results of the two studies indicates a high prevalence of musculoskeletal disorders among female students in Tehran.

Based on previous research, the underlying causes for skeletal disorders are obesity and overweight. In the current study, 27.4% of children were obese. In a study con-

ducted in 2002 in Tehran, the prevalence of overweight and obesity in this age group was 21% (Mozaffari & Naba'i 2003). Comparing results of these two studies shows increasing prevalence of obesity in this age group.

In this study, prevalence of forward head was 1.8%. In this disorder, the center of gravity of the head is placed ahead of the plumb line and evidently the cervical lordosis increases. In this disorder, a lot of pressure is exerted on the neck joints, because torque force increases on the spinal cord. Its complications are pain, unpleasant appearance, shortness of height, too much pressure on cervical cord and nerves, too much pressure on the temporomandibular area, dropped chest and shoulders, and imbalance. Forward head syndrome, if left untreated, leads to the rotation of shoulders to the inside and hunchback in long term. Thus, people should correct their wrong habits and learn how to sit and use tools properly. Because with disease progression and inflicting with arthritis, treatment will be much more difficult. While early diagnosis of this problem and performing corrective exercises can prevent these complications. A similar study that evaluated the prevalence of the problem in this age group has been not found. In the study by Saneh conducted on secondary school students, the prevalence of this disorder was reported to be 4.2%, along with poor body condition (Saneh 2009).

Another problem addressed in the present study, was lumbar disorders. The highest prevalent lumbar disorder in all children under study was lordosis (17.3%) and the least disorder was kyphosis (2.5%). The only Iranian study, which addressed the prevalence of kyphosis, was conducted on secondary school age children in Kurdistan Province in 2003. In which the prevalence of this problem was reported to be 2.4% (Rezaei et al. 2004). Although the best time to diagnose lumbar disorders and take appropriate action is at the age of 10-12, no research was found which screen this problem in this age group in Iran. The study conducted in Belgrade has reported the problem in elementary school children to be 10.5% and according to other authors, this figure is various in different societies and ranges from 4% to 51.4%. The reason for these differences relates to sitting habits and ergonomics culture on different places (Petrović et al. 2012).

In this study, the prevalence of scoliosis was 6.7%. Based on a study conducted by Rezaei et al. in Kermanshah Province, this disorder was reported to be 1.4% with a higher incidence in girls, while in a study in Minnesota, USA in 2008, this figure was between 0.59% and 7.7%. This difference was attributed to different measurement tools. In the same report, prevalence of

scoliosis in girls was higher than boys and researchers recommended screening of 10-12 years old girls in all schools (Rezaei et al. 2004).

In drooping shoulders, the shoulders are hanging downwards and person is not in so-called broad-shouldered posture which in addition to the unpleasant appearance, creates neck and back pain. In this study, 8.1% of children had this problem. Considering the gender and age of these children, if timely action is not taken, their mental images from themselves will be affected. The results of a study by Saneh (2009) conducted in the district 2 of Tehran in middle school students were significantly different from the current study results. According to the results, the uneven shoulder in the girls was 85.3% in which 1.9% of students were in poor physical condition (Saneh 2009). Previous studies on the causes of this problem mentioned the weight of the bag and its inappropriate carrying. It seems that teaching children and families regarding this issue is essential (Patel et al. 2011; Whittfield et al. 2005).

The prevalence of hallux valgus in this study was 16% which was similar to the study in Bayangan (Mirzaee & Salimi 2012). In a study conducted in Bayangan in Kermanshah Province, the prevalence of this disorder in girls of 11 to 15 years of age was reported to be 47.5%.

In this research, 20% of students suffered from flat foot. Studies have been conducted in different cities of Iran reported the prevalence of this disorder in the age group of 7 to 14 as 6.9%. In a study in Nigeria this figure was 18.2% among rural students and 32% among urban students (Abolarin et al. 2011). There was also a significant association between BMI and flatfoot in study subjects ($P=0.000$) which confirms the results of the study by Chen et al. (2009), Chang et al. (2010), and Evans and Rome (2011). Cousins et al. (2013) in their research investigated the pattern of flat foot in 7 to 11 years children with fat, overweight, and normal body index. The researchers concluded that pressure imposed on the middle area and the second to the fifth metatarsal bones change the arc of the child's foot and increase flat foot in these children.

According to the research results, the majority of female elementary students in Tehran suffer from at least one or two stature and skeletal abnormalities. In implementing screening programs to identify students with postural abnormalities, holding training classes for physical education teachers and educators, assessment and treatment of postural abnormalities by offering different solutions such as standardization of desk and benches in

schools, and establishing advanced centers for prevention and treatment of structural abnormalities are suggested to reduce the rate of these problems. Despite the attention to postural abnormalities, these studies lack enough cohesion and researchers have presented various statistics in their studies.

School nurse is the most important person who can prevent complications and progress of these problems by timely detection of them. The reason for importance of school nurse role is that skeletal problems in childhood are most often benign and self-limiting and most of the time they can be corrected with a series of exercises and training. Explaining the position of school nurse in Education and Training organization can be proposed in policy making fields. The role of physical training instructor in education and reform training of students is undeniable. Because by timely detection of this problem and delivering appropriate training to students, referring to higher levels is not necessary and in addition to maintain the child's physical strength, mental stress resulting from having different appearance is certainly prevented. Several studies have also shown that screening and timely action can significantly reduce the amount of healthcare costs and absence from school and absenteeism of parents.

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Conflict of Interest

The authors declared no conflict of interests.

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