

## Effect of Training Based on Choice Theory on Health-Promoting Lifestyle Behaviors among Menopausal Women

Anahita Ensan (MSc)<sup>1</sup>, Rahele Babazadeh (PhD)<sup>2\*</sup>, Hamid Reza Aghamohammadian (PhD)<sup>3</sup>, Monavar Afzal Aghaei (PhD)<sup>4</sup>

<sup>1</sup> MSc Student of Midwifery, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>2</sup> Assistant Professor, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>3</sup> Professor of Psychology, Department of Education and Psychology, Ferdowsi University of Mashhad, Iran

<sup>4</sup> Associate Professor, Management and Social Determinants of Health Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

### ARTICLE INFO

*Article type:*  
Original article

*Article History:*  
Received: 16-Jul -2017  
Accepted: 03-Feb -2018

*Key words:*  
Health-promoting lifestyle Behaviors,  
Choice theory,  
Menopause

### ABSTRACT

**Background & aim:** Menopause is considered as a stage of life that is often encountered by all women with symptoms as hot flashes, sweating, palpitations, sleep disorders, and urinary tract problems. The improvement of health-promoting lifestyle behaviors is one of the effective measures to moderate these symptoms by facilitating the women to enhance their lifestyle behaviors through making proper choices. The aim of this study was to measure the effect of training based on choice theory on health-promoting lifestyle behaviors in menopausal women.

**Methods:** This two-group pretest-posttest design was conducted on 40 menopausal women within the age range of 45-55 years, referring to healthcare centers in Mashhad, Iran, in 2016. The subjects were randomly assigned into intervention and control groups using simple random sampling method. The data collection instruments included a demographic questionnaire, a menopause knowledge/attitude questionnaire, as well as Health-Promoting Lifestyle Profile II (HPLPII), which consisted of six dimensions of nutrition, physical activity, responsibility for health, stress management, interpersonal relationships, and spiritual growth. The intervention group received training in seven 90-minute sessions based on choice theory. The data were analyzed in SPSS software using descriptive statistics, Mann-Whitney U test, independent t-test, paired sample t-test, and Friedman test.

**Results:** According to the results, after the intervention, the mean scores of total health-promoting lifestyle behaviors ( $P < 0.03$ ) and responsibility for health ( $P = 0.005$ ) showed a significant increase in the intervention group, compared to those in the control group.

**Conclusion:** As the findings of this study indicated, the midwives could play an effective role in the moderation of menopausal side effects using choice theory. In this regard, the needs of the menopausal women in terms of boosting their awareness and practicing health-promoting lifestyle behaviors should be identified to deal with menopausal problems.

► Please cite this paper as:

Ensan A, Babazadeh R, Aghamohammadian HR, Afzal Aghaei M. Effect of Training Based on Choice Theory on Health-Promoting Lifestyle Behaviors among Menopausal Women. Journal of Midwifery and Reproductive Health. 2018; 6(2): 1253-1263. DOI: 10.22038/jmrh.2018.10469

## Introduction

Today, health systems are developing their most important programs based on

\* Corresponding author: Rahele Babazadeh, Assistant Professor, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran, Tel: 09151279621, Email: babazadehr@mums.ac.ir

family health. In this regard, women are at the heart of family health because they not only manage family members' health status, but also represent the main pattern of education and promotion of a healthy lifestyle to the next generations. Moreover, the women constitute a big part of population in all age groups. Furthermore, their average lifetime and life expectancy are longer than those in men even though they have a higher burden of disease and have to face specific problems arising from their natural and physiological conditions, such as menopause (1).

In definition, menopause marks the end of women's reproductive age that occurs due to the lack of the follicular activity of the ovaries (2). The average age of menopause is 51 years (ranging within 47-53 years) (1). However, in a meta-analysis study, the average age of natural menopause in Iran was calculated as 48.183 years based on the random effects model with a confidence interval of 47.457-48.91 (3). Meanwhile, according to the latest study conducted in 2015, this age was reported as  $48.66 \pm 3.79$  years (2).

In 1990, 467 million menopause women were at the age of 50 years or older, 40% and 60% of whom were living in industrialized and developing countries, respectively. By 2030, this number would reach to one billion and two hundred million people. Considering this overall increase, the proportion of menopausal women in industrialized countries will be reduced to 24%, and this ratio will reach to 76% in developing countries (1). According to the Statistical Center of Iran, 51,004,079 women aged 40-64 years were living in Iran in 2017.

According to the Statistical Center of Iran, life expectancy for the Iranian men and women has been estimated as 72.1 and 74.6 years, respectively (4). Regarding this, the women spend about one third of their life in the menopause period (1). Therefore, menopause is a stage of life faced by most of the women. This biological process is characterized by low estradiol and progesterone, as well as increased follicle-stimulating hormone. In addition, this period is accompanied by some changes, such as

the end of reproductive capacity.

Although menopause is considered as a normal stage of women's life, a significant number of women are likely to experience various problems before and after this period. Moreover, epidemiological studies have shown that approximately 65-85% of the women go through menopause symptoms, including hot flashes, sweating, palpitation, sleep disorder, irritability, lethargy, depressed mood, insomnia, decreased libido, painful intercourse, and urinary tract problems (5).

Nowadays, life expectancy in the world has crossed over the border line of 62 years old. As life expectancy increases, the importance of health-promoting behaviors in the preservation of individuals' performance and independence, as well as improvement of their quality of life also progressively enhances (6). In this respect, health promotion is the process of empowering individuals to increase their control over health-related factors, and thereby to improve their health status.

The term health-promoting lifestyle behavior was defined by Walker as "a multi-dimensional model of perceptions and actions initiated by one's own motivation that helps to strengthen and sustain the level of health and self-prosperity in a person" (7). The implementation of the activities targeted toward the promotion of health and healthy lifestyle is considered as the main strategy for facilitating and protecting health and paying attention to the health issues and social welfare in women, who constitute half of population in each community. This measure is not only recognized as a human right, but also considered of utmost importance in terms of its impact on the health status of family and society (8).

Moreover, health-promoting lifestyle behaviors in the elderly have a potential effect on their health status and quality of life, which can consequently reduce healthcare costs (6). In this respect, according to the protocol released by the Ministry of Health and Medical Education in Iran, there is an emphasis on the role of lifestyle changes in the middle-aged people. Accordingly, such variations have been considered as the most important factors moderating

complications and preventing future side effects of menopause (9).

The menopausal women often suffer from the lack of information; consequently, the enhancement of their knowledge regarding the menopause problems is very beneficial. Awareness can have a positive effect on healthcare and lead to the development and provision of services and increased use of health services. Therefore, all women experiencing menopause require education and guidance (6).

Today, training is fulfilled using several methods (10). One of the teaching methods in this domain is training based on choice theory, the effectiveness of which in the promotion of health and health-related issues of various social groups has been confirmed. Choice theory is the psychology of internal control. Within this theory, it is suggested that the past has a dramatic effect on individuals' present life, but it does not determine their current behaviors. The level of responsibility, recognition, and respect for the existing reality, as well as the manner chosen based on the previous factors to meet the needs can also determine the current behavior (11).

According to the choice theory, what individuals are doing is behavior and all these behaviors are stimulated from the goals set by the inner self. Moreover, it is believed that the purpose of each behavior is to satisfy one of the five basic human needs (i.e., need for survival, belonging and love, power, freedom, as well as entertainment and pleasure). Based on this theory, when people fail to meet their needs, they choose to behave in a specific way. In other words, they choose a specific behavior and act to meet their needs. This behavior is aimed at satisfying the desired needs (12).

To the best of our knowledge, no specific studies have been conducted on the effectiveness of training based on this theory in menopausal women. The growing problems and physiological issues during menopause can undermine the physical and mental capacity of individuals. Lifestyle has a significant impact on self-care issues. The existing sex ratio in society (along with the aging

storm) highlight the role of women in society, some of whom are affected with psychological and socioeconomic difficulties. Regarding the mentioned issues and given the lack of a comprehensive and cohesive educational model for menopausal women, the present study was conducted to address the question whether the concepts of choice theory can affect the enhancement of health-promoting lifestyle behaviors in menopausal women.

## Materials and Methods

This quasi-experimental study was conducted on menopausal women within the age range of 45-55 years, referring to healthcare centers located in the city of Mashhad, Iran, using a two-group pretest-posttest design. The study population was selected using the multi-stage sampling method. To this end, first, out of the five main healthcare centers in Mashhad (No.1, No.2, No.3, Samen, and No.5), centers No.1 and No.3 were selected through simple random sampling technique. Then, out of the healthcare centers covered by these selected centers (i.e., those with active classes for menopausal women), four centers were randomly selected.

In the next step, drawing was employed to assign one center from the two centers of No.1 and No.3 to the intervention group and the other one to the control group. In the last stage, 40 individuals meeting the inclusion criteria of the study in each group were randomly selected using the convenience sampling technique based on their active records available in the given centers. Finally, the research context was specified as Danesh Amooz, Imam Ali, Lashgar, and Shahid Beheshti healthcare centers covered by the headquarter healthcare centers of No.1 and No.3 in Mashhad.

The inclusion criteria in this study were: 1) an elapse of 1-5 years from the last menstruation, 2) minimum of primary school education, 3) no hormone therapy, 4) no pharmaceutical treatment (i.e., psychoactive, nervous, narcotic, anxiolytic, and anticonvulsant drugs), 5) no infliction with or hospitalization for mental illnesses (i.e.,

chronic mental illnesses and cognitive problems, such as Alzheimer's disease or neurological disorders, disturbances causing disorders in individuals' consciousness and movements like stroke, dementia, and damage to the spinal cord), 6) lack of addiction, 7) availability of a contact number, and 8) residency in the city of Mashhad.

On the other hand, the exclusion criteria included: 1) unwillingness to participate in the study, 2) receiving training based on choice theory prior to the intervention, and 3) experience of major accidents in the past 6 months (i.e., loss of loved ones, betrayal of a spouse, severe illnesses, or imprisonment of close relatives).

The final sample size was obtained using the mean changes before and after physical activity according to a study performed by Entezari Meybodi (11) in both intervention and control groups with 95% confidence level, 80% test power, and at least 13 people. Considering the probability of sample attrition and the possible impact of confounding variables, sample size was determined as 20 cases in each group.

Informed consent was obtained from both intervention and control groups. The data were collected using a demographic characteristics form, a researcher-made menopause knowledge/attitude questionnaire, and Health-Promoting Lifestyle Profile II (HPLPII). In this study, the validity of the demographic, midwifery, and menstrual profile forms, the menopause knowledge/attitude questionnaire, and the educational content were determined by content validity method.

The research instrument was developed by studying the latest books and articles under the guidance of some professors. Then, it was evaluated by seven faculty members affiliated with Mashhad University of Medical Sciences. After reviewing and considering the suggestions provided by the aforementioned experts, the final form was prepared and administered. The validity of the HPLPII developed by Mohammadi Zeidi et al. was also determined through content validity method in 2011 (13).

The researcher also participated in a machine-behavior training workshop as

one of the choice theory training sub-groups held in the city of Tehran, Iran, in order to obtain qualifications in relation to the educational content based on choice theory and acquire the relevant certificate. The researcher was approved during the implementation of two training sessions in the presence of supervisors and specialist consultants. It should be noted that the demographic, midwifery, and menstrual form was objective and its reliability has been determined in several studies; therefore, there was no need to measure its reliability again.

In order to determine the reliability of the dimensions of knowledge and attitude within the menopause knowledge/attitude questionnaire, internal consistency method was employed using Cronbach's alpha correlation coefficient with the participation of 10 menopausal women at a single measurement, rendering Cronbach's alpha coefficients of 0.92 and 0.72, respectively.

Moreover, the reliability of the HPLPII was reported by Walker and Hill-Polerecky (1996) with the Cronbach's alpha coefficients of 0.94 (14). In a study conducted by Mohammadi Zeidi et al. (2011), the Cronbach's alpha coefficient for the reliability of this research instrument was reported as 0.82 (13). The reliability of HPLPII in the present study rendered a Cronbach's alpha coefficient of 0.93. It should be noted that the HPLPII was the modified version of the HPLP developed by Walker et al. measuring health-promoting lifestyle by focusing on an individual's initiatives and perceptions to maintain or increase the levels of well-being, self-prosperity, and self-esteem.

The given questionnaire consists of 49 items with six subcategories titled as nutrition, physical activity, responsibility for health, stress management, interpersonal relationships, and spiritual growth. This instrument is rated on a 4-point Likert scale (i.e., never, sometimes, often, and usually) to determine the extent that the respondent practice health-promoting lifestyle behaviors. To obtain the scores for each dimension, the scores for all items

related to the given dimension are added, and to get the total score of the questionnaire, the total scores of all dimensions are summed up. In this questionnaire, the higher and lower scores represent positive and negative health-promoting lifestyle behaviors, respectively. The maximum and minimum scores on this 49-item questionnaire are 196 and 49, respectively (14).

Regarding the menopause knowledge/attitude questionnaire, the knowledge section includes 30 items related to menopause and its side effects, developed based on the HPLPII subcategories. Accordingly, the responses to each item are in form of true and false dedicated the scores of 1 and 0, respectively. Moreover, the attitude measurement part with 16 items was developed in form of a 5-point Likert scale (i.e., strongly agree=5, agree=4, neutral=3, disagree=4, and strongly disagree=5). The items containing negative attitude were inversely rated.

**Educational Content:** These questionnaires were filled out at three stages, namely before the intervention, immediately after the last training session, and one month later, by the study participants. After completing the questionnaires, the training sessions were held for the intervention group for seven 90-minute sessions and once or twice per week as the participants desired. It should be noted that there was no intervention for the control group, and they only received routine care services from healthcare centers. The following is a summary of training sessions based on the concepts of choice theory:

**Session One:** Introducing menopause and strategies for the prevention of its side effects, as well as learning health-promoting lifestyle behaviors

**Session Two:** Discussing the concepts of choice theory, basic needs, and the why and the how behind behaviors

**Session Three:** Teaching positive behaviors and replacing destructive ones, as well as discussing ideal world and external control

**Session Four:** Designing and planning a healthy lifestyle based on the concepts of choice theory, healthy eating, and exercise

**Session Five:** Discussing the importance of interpersonal and effective relationships with others, as well as selection of responsible behaviors

**Session Six:** Understanding anxiety in the light of choice theory, stress management, and spiritual growth

**Session Seven:** Discussing concepts of choice theory as well as better choices in life and wrapping up the sessions

Upon the completion of the data collection, the forms were encoded and entered into a computer system. After ensuring the accuracy of the data entry, the data analysis was conducted by the SPSS Software (version 23). To describe the data, descriptive statistics, such as frequency (i.e., number and percentage) and indices of central tendency and dispersion (i.e., mean and standard deviation) were used. The Kolmogorov-Smirnov and Shapiro-Wilk normality tests were firstly employed to determine the normality of distribution. Then, parametric statistics were utilized to analyze the data provided that the variables were normally distributed; otherwise, nonparametric equivalents were run.

In order to check the homogeneity of the two groups in terms of qualitative variables, the Chi-square and Fisher's exact tests were used for the quantitative variables. Furthermore, Student's t-test and Mann-Whitney U test were utilized in case of abnormalities. The comparison of the main dependent variables within two groups in each of the stages before, immediately after, and after the intervention was accomplished using the repeated measures analysis of variance (ANOVA) and Friedman test for normally and non-normally distributed data, respectively.

In addition, the quantitative dependent variables were compared before and after the intervention in both intervention and control groups by means of the independent t-test and Mann-Whitney U test for normally and non-normally distributed data, respectively. Moreover, the paired sample t-test and Wilcoxon test were used for intra-group comparison and non-normal distribution, respectively,

## Results

Table 1 illustrates the demographic characteristics of the women in both intervention and control groups. According to the results, the two groups were comparable in

terms of the demographic variables, such as age, age of menarche, age of menopause, and duration of menstrual end (Table 1).

**Table 1.** Mean and standard deviation of age, age of menarche, age of menopause, and menopause duration in the intervention and control groups

variable	Intervention group	Control group	Test results
	Mean±standard deviation	Mean±standard deviation	
Age (year)	52.3±2.9	51.4±3.0	U=161.5 P=0.289 Mann-Whitney U test
Age of menarche (year)	12.8±1.3	13.4±1.6	U=103.5 P=0.243 Mann-Whitney U test
Age of menopause (year)	48.9±2.7	48.5±2.4	t=0.5 df=37 P=0.609 Independent t-test
Duration of menopause (year)	3.2±1.7	2.8±1.7	U=168.0 P=0.527 Mann-Whitney U test

The results of the statistical tests also revealed that the mean score of total health-promoting lifestyle behaviors in the group receiving trainings was significantly higher immediately and one month after the intervention, compared to that before the intervention ( $P<0.001$ ). However, according to the results of the independent t-test, the control group showed no significant difference in this regard one month after the intervention,

compared to the pre-intervention stage ( $P=0.360$ ). There was a significant difference between the two study groups in terms of the mean score of health-promoting lifestyle behaviors at the end of the study ( $P=0.033$ ).

Considering the dimension of spiritual growth, the results of the tests showed that the mean score of this variable had a significant increase in the intervention group immediately and one month after the intervention, compared to that before the intervention ( $P=0.001$ ).

**Table 2.** Mean and standard deviation of health-promoting lifestyle behaviors in menopausal women before and after the intervention in the intervention and control groups

Stage	Intervention group	Control group	Intergroup test results
	Mean±standard deviation	Mean±standard deviation	
Before the intervention	142.1±21.5	151.3±25.0	U=159.0 P=0.267 Mann-Whitney U test
Immediately after the intervention	159.6±22.4	-	-
One month after the intervention	166.0±18.9	150.7±24.6	t=0.5 df=37 P=0.609 independent t-test
One month difference before or after intervention	24.0±25.6	3.1±11.7	U=168.0 P=0.527 Mann-Whitney U test
Intragroup test results	$\chi^2=19.6$ df=2 P<0.001 Friedman test	t=0.9 df=19 P=0.369 Independent t-test	

However, the control group showed no significant difference in this regard between intervention and control groups before and after the intervention suggested no significant difference in this regard ( $P=0.080$ ).

Considering responsibility as the other dimension of health-promoting lifestyle behaviors, the results of repeated measures revealed that the intervention had a significant increase in the mean score of responsibility for health immediately and one month after the intervention, compared to that before the intervention ( $P=0.001$ ). Nevertheless, the mean score of responsibility for health in the control group obtained one month after the intervention demonstrated no significant difference, compared to that before the intervention ( $P=0.728$ ). The two groups showed a statistically significant difference in terms of the responsibility for health at the end of the study ( $P=0.005$ ).

Regarding the third dimension of behaviors, the test results indicated that the mean score for interpersonal relationships in the intervention group had witnessed a rising trend immediately and one month after the intervention, compared to that before the intervention ( $P<0.001$ ). In the control group also showed an increase in the mean score of interpersonal relationships at the end of the study, compared to that before the intervention; however, this difference was not statistically significant ( $P=1.000$ ). The comparison of mean scores for interpersonal relationships between the study groups at the beginning and at the end of the study revealed no significant difference ( $P=0.052$ ).

With respect to the stress management dimension, the findings indicated that the mean score of stress management in the intervention group had a significant enhancement immediately and one month after the intervention, compared to that before the intervention ( $P=0.001$ ). Nonetheless, the control group demonstrated a decrease in the mean score of this variable at the end of the study, compared to that before the study; however, this decline was not statistically significant ( $P=0.409$ ).

In terms of the physical activity dimension, the mean score of physical activity in the intervention had a statistically significant

these stages ( $P=0.220$ ). Moreover, the comparison of spiritual growth scores in the elevation immediately and one month after the intervention, compared with that before the intervention ( $P=0.013$ ). In this respect, in the control group showed a descending trend in terms of the mean score of physical activity one month after the intervention, compared to that before the intervention; however, this reduction was not statistically significant ( $P=0.181$ ). Furthermore, there was no statistically significant difference between the two study groups regarding this variable ( $P=0.102$ ).

Considering the dimension of nutrition, the mean scores obtained by the women in the intervention group had a statistically significant enhancement immediately and one month after the intervention ( $P=0.021$ ). In the control group, the mean score of nutrition was lower after the intervention, compared to that before the study. According to the statistical tests, such a rise was not significant ( $P=0.582$ ).

## Discussion

As the findings of this study indicated the intervention group showed higher changes in the total score of health-promoting lifestyle behaviors after the intervention, compared to the control group. Accordingly, the results of the present study suggested that health-promoting lifestyle behaviors in the intervention group had improved after the intervention, compared to that in the control group. In this respect, Karimi (2012) conducted a study entitled as "Impact of codified educational intervention based on individual empowerment model on health-promoting behaviors during menopause in 90 women covered by community health centers in the city of Zarandieh". They showed that the mean scores of health-promoting behaviors and the components of empowerment model was significantly different in the intervention group between the pre-intervention and post-intervention stages ( $P<0.001$ ) (6), which is consistent with the results of the present study.

In a study conducted by Robinson-Whelen targeted toward empowering women with disabilities, middle-aged women were subjected to a health promotion program focusing on accountability to mental, social, and physical health promotion. In the mentioned study, the

intervention group showed an improvement in physical health-promoting activities; however, there was little evidence indicating the enhancement of mental health promotion. They also reported the elevation of the mean scores of the five health promotion behavior dimensions after the intervention. They concluded that the health promotion program improved self-efficacy measures and increased healthy behaviors and physical health status (15).

In a study performed by Heidari et al. (2011), an increase in the mean scores of behaviors was observed after the intervention in the intervention group, particularly in the dimensions of physical activity, stress management, nutrition, mental development, responsibility for health, and interpersonal relationships (16). In addition, Khazan et al. (2015) conducted a study on the effect of teaching the concepts of reality therapy on the happiness of elderly men in the city of Ardabil, Iran. In the motioned study, the group receiving education witnessed a growth in the post-test scores and the follow-up ones; however, no rising trend was observed in the control group in this respect. Therefore, they demonstrated that teaching the concepts of reality therapy was effective on happiness among the elderly (17), which is in line with the results of the present study.

Regarding the findings of the related literature, it could be stated that group reality therapy, which is based on choice theory could have a significant effect on the physical and psychological health status of menopausal women. In this regard, the reality therapy is an attempt to help a person adopt choice theory or internal control psychology instead of external control psychology and accept that they can do something for themselves and that no one can do this without their permission (18).

Moreover, individuals can better meet their needs when they can control their own life. Accordingly, the higher fulfillment of such needs would result in more effective control. Accordingly, individuals always try to achieve what satisfies their needs and do what bestows them with a sense of control. The choice theory contains explanations on how and why people make choices in life. Using this theory, people

can learn to modify their choices in terms of lifestyle and have better selections, which can consequently lead to improved lifestyles (11).

Concerning the dimension of spiritual growth, the results of the tests showed that the intervention group had a statistically significant increase in the mean score of spiritual growth immediately and one month after the intervention, compared to that before the intervention. According to McCauley et al., increased age could convert spirituality and excellence into powerful sources for confronting inevitable changes and deprivations; therefore, paying attention to spiritual issues in daily life can be associated with more energy and less depression (19).

The achievement of spiritual well-being and promotion of this state without paying attention to its fundamental issues, such as identification of the spiritual needs, will not lead the individuals to the ultimate goal, which is spiritual well-being. In this respect, several researchers have identified and categorized the components of spiritual needs. These components include need for meaning and purpose, need for belonging and love, need for forgiveness, need for a source of hope and power, need for creativity, need for trust, need to express beliefs and individual values, need for spiritual activity, as well as need to express one's belief in God (20).

According to Glasser, the need for the sense of belonging and love is introduced as one of the basic needs considered as an introduction and a precondition for meeting other needs in a way that it can play a decisive role in human behavior, health, or mental illnesses. Concerning the consistency of the components of spiritual beliefs, as well as those of choice theory, teaching this theory can be very effective in the promotion of spiritual well-being and growth in menopausal women (19).

In relation to another dimension of health-promoting lifestyle behaviors, namely responsibility for health, the results of the study demonstrated that the mean score of this variable in the intervention group showed a statistically significant enhancement immediately and one month after the intervention, compared to that before the intervention. In the choice theory, individuals are trained to boost their



responsibility for their behaviors. According to this view, human control over one's behaviors is a conscious one, so that an individual chooses a general behavior and is responsible for his/her choices. Individuals also choose their desires, expectations, thoughts, beliefs, and actions in a way that they can make the most important and desirable states in themselves.

The behavior is also the result of human choices. This view can increase a source of internal control and a sense of responsibility in an individual. It also seeks to help an individual identify and assess one's needs and abilities accurately. It should be noted that responsibility is one of the noble characteristics of human, which implies the growth and development of human society, as well as the conservation of nature. In this respect, Glasser (2000) cited in Qanbari linked responsibility to mental health, stating that the more people are assigned with more responsibilities, the higher their mental health status and vice versa. Furthermore, the purpose of this theory is to encourage a person to adopt a responsible behavior (21).

Considering the third dimension of behaviors, the mean score of interpersonal relationships in the intervention group had an increasing trend immediately and one month after the intervention, compared to that before the intervention. In the study carried out by Heidari et al. (2011), the mean score of interpersonal relationships was not statistically significant in the control group after the intervention as compared to that before the intervention (16). It should be noted that interpersonal relationships represent a person's status in terms of creation and continuity of relationships that can provide social and moral support as a strong predictor of quality of life.

Social support and interpersonal relationships have been also reported among the most stable health parameters in different studies. Glasser has frequently put an emphasis on social relationships and coping well with human beings as one of the most important components in all his investigations. Consistent with Glasser's view, sustaining and maintaining valuable social relationships among people is of utmost importance due to its association with basic human needs (22).

In terms of stress management, the findings

showed that the intervention group had a statistically significant increase in the mean score of stress management immediately and one month after the intervention as compared to that before the intervention. Heidari et al. (2011) also revealed a statistically significant difference between both groups in this regard after the intervention, which is indicative of the effectiveness of the intervention in the promotion of stress management behaviors (16). In line with our findings, Ali Ghol et al. (2006) used group discussion to treat stress management and reported this intervention was effective in the reduction of psychological stress (23).

With regard to physical activity, the mean score of physical activity in the intervention group had a statistically significant increase immediately and one month after the intervention. According to the investigation by Heidari et al. (2011), the intervention group showed an increase in the scores of behavioral dimensions of physical activity, stress management, nutrition, mental growth, responsibility for health, and interpersonal relationships after the intervention (16).

In relation to the dimension of nutrition, the mean score of nutrition in women examined in the intervention group had a statistically significant increased immediately and one month after the intervention. Nonetheless, the comparison of the mean scores of nutrition between the intervention and control groups was not significant after the intervention. According to the results of the investigation by Heidari et al. (2011), the control group had a statistically significant lower nutrition mean scores before the intervention than that at the end of the study ( $P=0.378$ ). Nevertheless, they observed no statistically significant difference between nutrition mean scores of intervention and control groups before and after the intervention, which is in line with the findings of the present study (16).

## Conclusion

The results of this study indicated the relevance and impact of the positive components of choice theory on health-promoting lifestyle behaviors. Regarding this and given the numerous problems encountered by menopausal women, the concepts of choice

theory can be used to inform menopausal women about their choices and satisfy them to have better control over their life, and consequently adopt more effective behaviors for promoting their health status.

The midwives are the first advisors for the women of all ages (i.e., from puberty to menopause). Therefore, they should provide the menopausal women with proper trainings based on choice theory and timely follow-ups as the most important steps in promoting health among this population and reducing their physical and mental disorders. Among the limitations of the study was the lack of relevant resources and literature on training based on choice theory in menopausal women. Moreover, individual differences in terms of learning were out of the researcher's control. It is suggested to conduct the same study on premenopausal women.

### Acknowledgements

This study was the result of a dissertation submitted in partial fulfillment of the requirements for the degree of Master of Science in Midwifery approved by Mashhad University of Medical Sciences, Mashhad, Iran, with the code number of IRCT2017012832237N1 archived in Iranian Registry of Clinical Trials. We, hereby, express our gratitude to the honorable Research Council and Ethics Committee of Mashhad University of Medical Sciences and Mashhad School of Nursing and Midwifery, as well as the participants who cooperated in this study.

### Conflicts of interest

The authors declare no conflicts of interest.

### References

- Noroozi E, Kasiri DN, Eslami AA, Hassanzadeh A, Davari S. Knowledge and attitude of 40-45-year-old women toward menopause. *Journal of Health System Research*. 2011; 7(4):460-468.
- Golshiri P, Akbari M, Abdollahzadeh MR. Age at natural menopause and related factors in Isfahan. *Journal of Menopausal Medicine*. 2016; 22(2):87-93.
- Rajaeefard A, Mohammad-Beigi A, Mohammad-Salehi N. Estimation of natural age of menopause in Iranian women: a meta-analysis study. *Koomesh*. 2011; 13(1):1-7 (Persian).
- Extent of population and housing census. Statistical Center of Iran. [https://www.amar.org.ir/Portals/0/Files/abstract/1390/sarshomari90\\_nah\\_aaii.pdf](https://www.amar.org.ir/Portals/0/Files/abstract/1390/sarshomari90_nah_aaii.pdf); 2012.
- Makvandi S, Bastami A, Shoshtari Zargar S, Yazdizade H, Etemadpour Y, Taghavi Far A. Quality of life and related factors in postmenopausal women referred to health centers in Ahwaz East. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2013; 16(59):6-13 (Persian).
- Karimy M. Evaluation of the effect of educational intervention based on empowerment model of the health promotion behaviors on menopausal women. *Daneshvar Medicine*. 2011; 94:63-72 (Persian).
- Moosavi S. The relationship between lifestyle and quality of life in postmenopausal women. *Beheshti University of Medical Sciences Journal*. 2010; 11(5):193-202.
- Aghamolaei T, Tavafian SS, Ghanbarnejad A. Health locus of control and its relationship with health promoting behaviors among people over 15 in Bandar Abbas, Iran. *Journal of Health Management*. 2014; 17(55):1-16.
- Azh N, Danesh M. Effect of education on middle-aged women on premenopausal side effect. *Zahedan Journal of Research in Medical Sciences*. 2011; 13(10):12.
- Afshari P, Yazdizadeh S, Abaspour Z, Haghghi M. Group study to evaluate the effectiveness of cognitive behavior therapy on postmenopausal women's health-promoting lifestyle. *Ahvaz: Ahvaz University of Medical Sciences*; 2016 (Persian).
- Entezari MM, Afkhami I, Nasirian M. The effectiveness of treatment based on choice theory on improving the lifestyle of women suffering from obesity. *Journal of Health Promotion Management*. 2015; 4(2):1-6.
- Kazemi-Mojarad M, Bahreynian A, Mohamadi-Arya A. Impact of training choice theory on quality of life and happiness of people quitting drugs. *Iranian Journal of Health Education and Health Promotion*. 2014; 2(2):165-174.
- Mohammadi Zeidi I, Pakpur Hajji A, Mohammadi Zeidi B. Reliability and validity of the Persian version of the health-promoting lifestyle questionnaires. *Journal of Mazandaran University of Medical Sciences*. 2012; 21:156-162 (Persian).
- Walker SN, Hill-Polerecky DM. Psychometric evaluation of the health-promoting lifestyle profile II. Omaha: University of Nebraska Medical Centre; 1996.
- Robinson-Whelen S, Hughes RB, Taylor HB, Clovard M, Mastel-Smith B, Nosek MA. Improving health and health behaviors of women aging with physical disability: a peer-led health promotion program. *Women's Health Issues*. 2006; 16(6):334-345.

16. Heidari F, Mohammad Khan Kermanshahi S, Vanaki Z. The effect of a supportive health promotion on the lifestyle of premenopausal teachers. *Feyz Journal*. 2013; 17(1):14-24.
17. Khazan K, Younesi SJ, foroughan M, Saadati H. The effectiveness of training reality therapy concepts on the happiness of elder people. *Iranian Journal of Aging*. 2015; 10(3):174-181.
18. Sahebi A, Zalizadeh M, Zalizadeh M. Choice theory: an approach to accountability and social responsibility. *Rooyesh-e-Ravanshenasi Journal*. 2014; 4(11):113-134 (Persian).
19. McCauly J, Taroley MJ, Haaz S, Bartlett SJ. Daily spiritual experiences of older adults with and without arthritis and the relationship to health outcomes. *Arthritis Care and Research*. 2008; 59(1):122-128.
20. Karimi A. The secret of spiritual health. *Journal of Islamic Education*. 2009; 15(14):73-90.
21. Ghanbari Hashem Abadi BA, Sepehri Shamlo Z, Mahdizadeh M. The effectiveness of reality therapy on quality of life and responsibility of married women in Mashhad. [Master Thesis]. Mashhad: Ferdowsi University of Mashhad; 2012 (Persian).
22. Pengpid S, Peltzer K, Mirrakhimov EM. Prevalence of health risk behaviors and their associated factors among university students in Kyrgyzstan. *International Journal of Adolescent Medicine and Health*. 2014; 26(2):175-185.
23. Ghol MA, Shojaei Zadeh D, Gholestan B. The effect of stress management education on job stress in Qom health and medical centers. 3rd National Congress on Health Education and Promotion, Hamadan; 2008. P. 171 (Persian).