

The Effect of Intervention Based on Pender's Model of Health-Promoting Self-Care Behaviors in Women who are the Head of their Household

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Abstract

Background: A number of studies have reported that women as the head of the household suffer from poor physical health. Yet, a few studies are available on the effects of health-promoting interventions for this vulnerable group.

Objectives: The present study was conducted to determine the effect of an intervention based on Pender's model on health-promoting behaviors in women who were the head of their household.

Methods: A quasi-experimental study was conducted on 66 women, who were the heads of households with inappropriate physical health-promoting behaviors, selected by the consensus method and allocated to intervention and control groups using the randomized permuted block method. The intervention group received supportive-educational intervention according to Pender's model. Posttest was carried out for both intervention and control groups two months after the end of the intervention. Data were analyzed using descriptive statistics and inferential tests, including independent samples t, paired t, Chi-square, Mantel-Haenszel tests and logistic regression analysis.

Results: The subjects' mean age was 39.58 ± 6.69 years, of whom, 47% were widowed; they were mostly housewives with a mean schooling of 7.97 ± 4.31 years, and 74.2% had insufficient income. Prior to the intervention, women who were the head of the household and had poor level of health-promoting behaviors were selected. There was no significant difference between the two groups in mean score of the components of the health-promoting model ($P < 0.05$). The intervention group had significantly better performance in physical health-promoting behaviors, two months after the intervention ($P < 0.001$).

Conclusions: The supportive-educational intervention was effective on the physical health-promoting behaviors of women who were the head of the household. Thus, this model can be used as a framework for planning interventions to promote the physical health of such women.

Keywords: Health Promotion, Pender's Model, Physical Health, Women, Head of Household

1. Background

The number of female-headed families is increasing for various reasons such as divorce, separation, immigration and death. In fact, 12.1% of Iranian households are now headed by women (1). Managing a single-parent family is a stressful condition in developing countries that exposes the family to a variety of risks, including poverty and poor economic status (2), the burden of playing multiple roles (3) and strategies such as self-sacrifice by lonely parents, who have grown hypersensitive to providing for their children's needs (4). To effectively perform their caring responsibilities, women must always try to maintain and promote their own health and well-being (2). Females who are the head of a family are exposed to greater physical and mental harms in their fulfillment of their responsibilities

(5, 6). Therefore, they cannot properly preserve and promote their own health, and in many cases, suffer from poor health. They usually experience high levels of stress, are more likely to experience physical harm (2) and diseases such as lumbar pain, arthritis and cancer (4) and tend to live shorter than married women (7, 8).

Identifying the socioeconomic problems faced by this vulnerable group of women and seeking to empower them in these areas have become the focus of attention for many researchers in different fields (9, 10). There have been a few interventional studies that have examined the physical health of female household heads, in an attempt to maintain and promote their physical health-promoting self-care behaviors (3, 4, 11).

Through health promotion, community health nurses

can help reverse unequal health outcomes (12). Health-promoting self-care behaviors are a group of health measures adopted by individuals to promote their health, prevent the incidence of diseases, limit the progress of already-developed diseases and generally maintain their health (13). Several factors affect health-promoting self-care behaviors, including demographic variables such as age and gender (13), personal attitudes and beliefs (14), social and environmental factors (15), perceived benefits and barriers (16) and perceived self-efficacy as cognitive-perceptual factors that should be emphasized in the design and implementation of health-promoting self-care empowerment programs (17).

In accordance with international efforts for the prevention of diseases and the promotion of health behaviors, different models have been proposed by nurses. One of these models is the health promotion model proposed by Pender in 1982. This model emphasizes on the promotion of health and the empowerment of individuals for achieving health and preventing diseases through behavioral changes (18). According to this model, behaviors are affected by social, psychological and environmental factors. Moreover, perceived barriers, perceived benefits, interpersonal influences and perceived self-efficacy are important constructs in aiding behavioral change and improvement (19). In Pender's model, health-promoting behaviors are regarded as the desired behavioral outcome and the ultimate end of health care interventions (20). Various studies have shown that this model can be used as a framework for planning interventions intending to improve health-promoting behaviors (21-25). This nursing model was previously used as a means of improving physical health-promoting self-care behaviors in women with respect to nutrition, rest, sleep and physical activity (23), and also as a means of developing their social behaviors and preventing social isolation and loneliness (26). However, it has never been used in female household heads as a group of women with special needs.

The existing literature on the topic focuses on the role of health professionals, especially family and community health nurses, in helping female household heads improve their health and in providing necessary support to this group of vulnerable women (23, 27). Given their direct contact with patients and their better knowledge of their problems or the social resources available to them, community health nurses have a central role in influencing women's beliefs and performance with regard to health promotion and disease prevention. As health educators and health researchers are seeking to identify the existing problems and to implement appropriate social and behavioral interventions, community health nurses can also encourage women, especially female household heads, to take effec-

tive disease prevention and health measures for both their family and themselves (27, 28). We hope that our research provides an application program for community and family health nurses, to improve the health care behaviors among these vulnerable women in Iran, and other similar countries.

2. Objectives

The present study aimed to determine the effect of a supportive-educative intervention according to the Pender's model on physical health behaviors in female household heads.

3. Methods

3.1. Study Design and Participants

This interventional study was conducted between February and September 2015 on female household heads covered by all of health care centers (three centers) in Gonabad city of Iran. The inclusion criteria consisted of having at least one child younger than 18, physical and mental ability for participation in the program and poor to moderate health-promoting self-care behaviors based on their answers to physical health behavior questionnaire, and consenting to participate in the study. The exclusion criteria consisted of an unwillingness or inability to participate in the program, failure to participate in more than one of the educational sessions, absence in the sessions, remarriage over the course of the program and moving to another city or village.

By the census method and according to the inclusion criteria, 66 clients were selected from 72 clients covered by the centers and were then equally allocated to the intervention ($n = 33$) and control group ($n = 33$) using balanced block randomization (Figure 1). For this purpose, nine blocks of four were first formed for each group. Next, block sequences were determined using a table of random numbers.

3.2. Instruments

Data were collected using three questionnaires. The first questionnaire examined participants' demographic details and the second questionnaire was part of the adult version of the Health-Promoting Lifestyle Profile (HPLP II) designed by Walker et al. (29). The original HPLP II investigates six aspects of the respondent's life and habits, including "physical activity", "nutrition", "health responsibility", "spiritual growth", "interpersonal relations" and "stress management", and has 52 items. The validity and

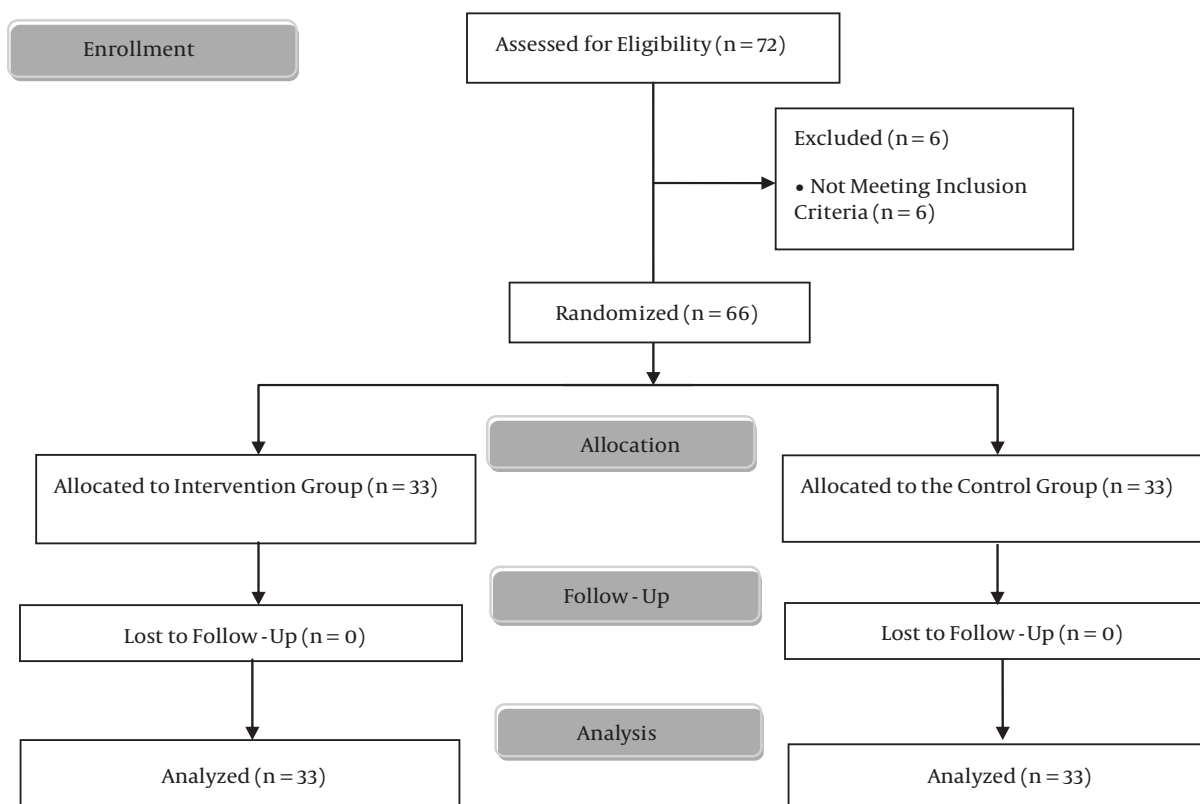


Figure 1. Consort Flow Diagram

reliability of this questionnaire have been assessed by earlier studies, resulting in reliability coefficients of 0.9 for the whole scale and 0.7-0.9 for the subscales (30). In Iran, the psychometric properties of the HPLP II have been examined on a sample of Iranian adolescents, resulting in reliability coefficients of 0.84 for the entire scale and 0.7-0.77 for the subscales (31).

Based on the objectives of the study, three sections of the original HPLP-II pertaining to physical health-promoting behaviors were used, including: physical activity (eight items), nutrition (nine items), and health responsibility (nine items), making a total of 26 items. All the items were scored based on a four-point Likert-type scale (1 = never, 2 = sometimes, 3 = often and 4 = routinely). Also we had one question about the main supporter of our participants in health promoting behavior. The overall score of physical health-promoting behaviors varied from 26 to 104. Thus, scores less than 18 indicated poor, 19 to 27 moderate and more than 27 good health-promoting behaviors in that subscale, yet in the analysis, poor and moderate levels were considered as inappropriate, and good level was considered as appropriate level. The content validity of

the questionnaire was assessed through surveying eight professors from the researchers' university and four from outside universities with ample expertise and experience in epidemiology, nursing health education and women's health, whose views were applied to the questionnaire and its validity was confirmed. The reliability of the tool was assessed using the test-retest method (with a four-week interval) on 15 clients and the correlation coefficients were 0.93 for the entire questionnaire, 0.87 for the physical activity subscale, 0.85 for the nutrition subscale and 0.88 for the health responsibility subscale.

The third questionnaire was a researcher-made questionnaire that was designed through extensive literature review and contained items based on the constructs of Pender's health-promoting model, including perceived benefits (7 items), perceived barriers (18 items), interpersonal influences (10 items) and perceived self-efficacy (14 items). The items on perceived benefits, perceived barriers and interpersonal influences were scored based on a four-point Likert-type scale with options ranging from totally disagree = 1 to totally agree = 4. The overall score of perceived benefits ranged from 8 to 32, perceived barriers from 18 to

72 and interpersonal influences from 10 to 40. Each item on perceived self-efficacy was scored from 0 to 100, resulting in an overall score of 0 to 1400. The content validity of the questionnaire was confirmed by the aforementioned experts. The reliability of the third part was also assessed using the test-retest method as mentioned above and the correlation coefficients were 0.78 for the entire questionnaire, 0.76 for perceived benefits, 0.92 for perceived barriers and 0.86 for interpersonal influences.

3.3. Procedures

At pretest, all participants were invited to the designated healthcare centers to respond to the study instrument. The intervention group then participated in an educational-supportive program comprised of six 60-minute sessions on nutrition, physical activity and health responsibilities as well as barriers to physical health-promoting behaviors, such as parenting style, playing multiple roles, poor financial status, time constraints and time management, lack of motivation for self-care, especially in cases of chronic diseases and cancer. The sessions were held twice per week using lectures, question and answering and skill training (for example, learning how to compile a daily schedule and how to have a successful time management). The outline of the educational program is shown in [Table 1](#). Two additional sessions were also held to revisit the topics discussed and to answer any potential questions. The participants were also paid two home visits. The first home visit was arranged within five days of the last educational session. The corresponding author arranged to visit the participants in their home in order to observe their teamwork and behavior changes firsthand. The second home visit was carried out before the end of the intervention, to offer the participants additional supportive-educational materials according to their personal needs and based on the objectives of the study (i.e. to introduce them to health care and supportive services, respond to their questions and help them design a physical activity or nutrition plan). Two months after the last session, the corresponding author called all the participants in both groups and once again invited them to the designated health care centers to complete the second and the third parts of the instrument.

3.4. Ethical Considerations

The present study was approved by the Ethics Committee of Gonabad University of Medical Sciences under the following code: GMU.REC.1393.139. All the stages of the study were conducted with the consent of the health care center authorities and efforts were made not to disrupt the health personnel's job. Participants were briefed on the

objectives and methods of the study and ensured about the voluntary nature of participation in and withdrawal from the study as well as the confidentiality of their data. Informed oral consents were then taken from all participants. An educational intervention was also performed for the control group after the end of the study.

3.5. Data Analysis

The data were analyzed using the SPSS-13 software and described using the tables of frequency distribution (for qualitative data) and mean and standard deviation (for quantitative data). The quantitative data (such as age and years of education) were analyzed using the independent samples t-test to compare the mean pre and post intervention values between the groups, and the paired t-test for intra-group comparisons. The qualitative data, such as the support organization, were analyzed using the chi-square test. Despite the random allocation of participants into the intervention and control groups, there were still significant differences between the groups in terms of age and marital status. Mantel-Haenszel statistics and the logistic regression analysis were therefore used to control the confounding effects of these variables.

4. Results

A total of 66 female household heads participated in this study. [Table 2](#) presents the demographic data of the participants in the two groups. The mean age of the participants was 37.09 ± 6.17 years in the control group and 42.06 ± 6.33 in the intervention group. The majority of participants in the two groups were housewives. The mean number of years of education received by the participants was 7.18 ± 4.28 in the intervention group and 8.76 ± 4.25 in the control group. No statistically significant differences were observed between the two groups in terms of the demographic variables, with the exception of age and marital status. Mantel-Haenszel statistics and the logistic regression were used to control the confounding effects of these two variables.

No significant differences were observed between the two groups in terms of constructs of the health-promotion model before the intervention. However, significant differences were observed between the two groups after the intervention ([Table 3](#)). As for the main role of interpersonal influences in health-promoting behaviors, family members and friends were found to be the biggest supporters of female household heads before and after the intervention.

According to [Table 4](#), the mean scores of nutrition, physical activity and health responsibilities showed no sig-

Table 1. The Outline of the Education Program

Session	Description
First	Participants were motivated to actively pursue health-promoting behaviors through understanding the importance of these behaviors and the factors affecting health and being aware of the barriers to these behaviors as per the analysis of their own responses to the questionnaires and the analyses provided by other studies.
Second	Participants received training on health-threatening diseases, especially breast and uterine cancer, and the importance of self-examination for the diseases and being screened by their healthcare providers through images and human models and with an emphasis on their cost-effectiveness (as the analysis of the women's responses revealed that they did not have adequate knowledge about the importance and the means of self-care and believed these measures to be costly)
Third and fourth	Participants practiced time management as a major challenge they were faced with and group exercises for mastering the art of writing a daily schedule.
Fifth	They received training on proper nutrition and physical activity and their importance for their own and their children's health; that is, on healthy food choices that fell within the family's budget and met the members' particular nutritional needs and on the choice of appropriate exercise programs.
Sixth	Since the mothers highly prioritized their children's needs and their various responsibilities as the head of the family, lectures were given on different parenting styles and their outcomes, and proper parenting behaviors and rational ways of dealing with children and responding to their needs. At the end of the sixth session, participants were given pamphlets and booklets on physical health-promoting behaviors.

Table 2. Demographic Characteristics in the Intervention and Control Groups^a

Variable	Group		P Value
	Control	Intervention	
Age, y	37.09 ± 6.17	42.6 ± 6.33	0.002 ^b
Years of education	8.76 ± 4.25	7.18 ± 4.28	0.13 ^b
Number of children	1.79 ± 0.05	2.03 ± 1.07	0.305 ^b
Number of dependents, ≤ 18 years	1.76 ± 0.83	1.73 ± 0.72	0.345 ^b
Job			0.757 ^c
Housewife	7 (21.2)	6 (18.2)	
Non housewife	26 (78.8)	27 (81.8)	
Income			0.778 ^c
Less than enough	24 (72.7)	25 (75.8)	
More than enough	9 (27.3)	8 (24.2)	
Marital status			0.026 ^c
Widowed	11 (33.3)	20 (60.6)	
Divorced	22 (66.7)	13 (39.4)	
Time supervision			0.618 ^c
Three years or less	15 (45.5)	13 (39.4)	
More than three years	18 (54.5)	20 (60.6)	

^aData are expressed as mean ± SD or No (%).

^bT-test.

^cChi-square.

nificant differences between the two groups before the intervention. However, two months after the intervention, the scores of nutrition and health responsibility increased significantly in the intervention group ($P < 0.001$). Although the mean score of physical activity increased in

the intervention group, the difference was not statistically significant between the two groups ($P = 0.393$). Mantel-Haenszel statistics and logistic regression showed that age and marital status, as two confounding variables, had no effect on health behaviors (Table 5).

Before the intervention, 100% of the intervention group and 100% of the control group had inappropriate health-promoting self-care behaviors. However, two months after the intervention, the rate of inappropriate self-care in the intervention group and in the control group were 39.39% and 100%, respectively ($P < 0.001$). The perceived barriers noted by most of the participants included the heavy costs of diagnostic examinations and tests, child care duties and attending their children's needs, fatigue due to daily chores, heavy workloads, the fear and shame of performing examinations, time constraints and the lack of enough knowledge and motivation.

5. Discussion

The results obtained revealed poor health-promoting self-care behaviors in both groups of women before the intervention. This finding is consistent with the results of earlier studies conducted on female household heads (4, 9, 32) and shows the vulnerability of these women and their greater exposure to harm compared to single mothers, women with no children and mothers with husbands (5). The participants of the present study were mostly housewives, had little education and suffered from a poor economic status. Some studies have reported these factors as risk factors for the vulnerability of female household heads (4, 32). These findings need to be considered because our participants were middle-aged women, and the risk

Table 3. Mean Scores of Constructs of Health-Promoting Model Before and After Intervention in Both Groups^a

Variable	Before Intervention		P Value ^b	After Intervention		P Value ^b	P Value ^c	
	Intervention	Control		Intervention	Control		Intervention	Control
Perceived benefits	27.15 ± 2.75	26.79 ± 2.75	0.287	29.39 ± 2.03	26.76 ± 2.84	< 0.001	< 0.001	0.744
Perceived barriers	49.94 ± 9.54	51.61 ± 9.49	0.479	37.61 ± 7.61	52.42 ± 9.17	< 0.001	< 0.001	0.038
Perceived self-efficacy	352.77 ± 21.877	331.43 ± 82.844	0.665	331.43 ± 18.998	240.47 ± 42.838	0.028	0.028	0.665
Interpersonal influences	27.30 ± 56.4	29.61 ± 3.60	0.512	34.00 ± 3.78	29.61 ± 3.54	< 0.001	< 0.001	0.999

^aValues are expressed as mean ± standard deviation.^bT-test.^cPaired t-test.**Table 4.** Nutrition, Commitment to Health, and Physical Activity Before the Intervention in Both Groups^a

Variable	Group		P Value ^b
	Intervention	Control	
Time of the measurement			
At baseline			
Physical activity	3.21 ± 12.61	2.87 ± 12.67	0.936
Nutrition	2.94 ± 22.03	3.55 ± 21.30	0.368
Commitment to health	4.93 ± 20.00	4.71 ± 22.06	0.087
After two months			
Physical activity	5.09 ± 21.39	2.85 ± 13.12	< 0.001
Nutrition	4.08 ± 30.85	3.95 ± 21.94	< 0.001
Commitment to health	4.81 ± 28.58	4.77 ± 22.15	< 0.001

^aValues are expressed as mean ± standard deviation.^bT-test.**Table 5.** Results of the Logistic Regression Analysis to Compare the Post-Test Health Behaviors of the Two Groups in Terms of the Confounding Variables of Age and Marital Status Groups

Dimension	OR (Odds Ratio)	CI 95%	P Value
Physical activity			
Study group	0.352	0.032,3.853	0.393
Age	1.188	0.989,1.427	0.65
Marital status	0.548	0.043,7.034	0.644
Nutrition			
Study group	0.004	0.000,0.058	< 0.001
Age	0.911	0.775,1.070	0.255
Marital status	0.237	0.034,1.641	0.145
Commitment to health			
Study group	0.085	0.021,0.340	< 0.001
Age	0.920	0.826,1.025	0.130
Marital status	0.432	0.119,1.574	0.204

of chronic diseases and gynecologic cancers are evidently greater in midlife.

The supportive-educational intervention undertaken in this study significantly improved the health-promoting

behaviors in the intervention group. Carreno et al. also reported that interventions based on Pender's model can significantly improve the health and lifestyle of Christian women (23). In a similar study, Carreno et al. focused on improving behaviors by educating women on the importance of clean air, enough rest, enough exposure to sunlight, exercise, cooking, reducing sources of stress, health responsibility and good nutrition. However, the present study focused on areas such as time constraints, heavy costs, lack of motivation, child-care duties, heavy workloads, fatigue due to daily chores, fear and shame.

The results of the present study also showed significant improvements in nutrition behaviors in the intervention group compared not only to the baseline, but also to the control group. An earlier study also confirmed the effect of an intervention based on Pender's model on improvement of the frequency and nutrient intake in Iranian students (33). The results achieved in spite of the lack of changes in the women's financial means, showed success of the intervention in encouraging self-care in the women and in enabling them to perceive the importance of healthy nutrition for both themselves and their children.

At the start of this study, both the intervention and control groups showed poor behaviors in the aspect of health responsibility, especially in relation to screening for breast and uterine cancers. However, a significant difference was observed between the two groups after the intervention. A number of previous studies showed that most women are carelessness in their health responsibility behaviors (34, 35). However, such a careless behavior is more common in female household heads. Although appropriate knowledge is a prerequisite for improvement of health behaviors (36), supportive intervention such as introducing screening services and cost-effectiveness of these services can motivate women to take advantage of such services.

Despite their positive attitude toward physical activity, the examined women had little physical activity before the intervention, which is consistent with the findings of earlier studies (37). However, the intervention was not effective in improving women's health-promoting behaviors in the domain of physical activity. Perhaps, suggestions about forming walking clubs with friends are unproductive in this group of women. However, another study reported the positive effect of health-promoting model in increasing physical activity in patients with diabetes (25). Perhaps patients with diabetes are more motivated for recovery compared to participants in the present study who did not consider themselves ill and felt barriers such as time constraints. Furthermore, our participants were women with no husbands, had difficulty in finding an appropriate location for exercise and experienced numerous social barriers. Therefore, only focusing on the removal of

barriers such as the lack of motivation, poor time management and insufficient knowledge about the importance of physical activity does not suffice for improving this aspect of health behaviors in these women (4). The results of the study also revealed improved interpersonal relationships with family and friends, but there was no change in the support received from neighbors or healthcare personnel. An earlier study based on Pender's model emphasized on how improved interpersonal relations can reduce the feeling of loneliness in old people (26). Further interventions seem to be needed to increase the level of social support and social relations in women who are the head of the household.

In the present study, changes in physical health-promoting behaviors in the intervention group were associated with a reduction in the score of perceived barriers and an increase in the scores of perceived benefits, perceived self-efficacy and interpersonal influences. These constructs have been recognized as factors affecting behavior change. Although perceived self-efficacy has been regarded as the more effective construct in behavioral change (17), the present study concentrated on improvement of knowledge, removing perceived barriers and promotion of perceived benefits. In one study conducted on health behaviors in Iranian workers, the removal of perceived barriers and the promotion of perceived benefits led to improvements in health behaviors (24). The results of a study conducted on oral health in students reported perceived self-efficacy and interpersonal role-modeling as the strongest predictors of oral health behaviors (22).

In conclusion, the present study used a brief educational-supportive nursing intervention to improve physical health-promoting self-care behaviors in female household heads as a rather neglected group in the society. Despite the small sample size, self-reports showed the effectiveness of the intervention. However, the other dimensions of their health, their additional roles and the supportive system available to them should be further examined. Assessing the long-term effect of this intervention on health-promoting self-care behaviors and health outcomes appears essential in this group. Future researchers are recommended to conduct multidisciplinary studies on female household heads using interventions that choose holistic support strategies for improving health behaviors in this vulnerable group of women.

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Footnotes

Authors' Contribution: Study concept and design: Shahla Khosravan, Ali Alami, Mohammad Reza Mansoorian, and Marzie Kamai; acquisition of data: Marzie Kamali; analysis and interpretation of data: Shahla Khosravan, Ali Alami, Mohammad Reza Mansoorian and Marzie Kamai; drafting the manuscript: Shahla Khosravan and Marzie Kamai; critical revision of the manuscript for important intellectual content: Shahla Khosravan, Ali Alami, Mohammad Reza Mansoorian and Marzie Kamai; statistical analysis: Ali Alami, and Marzie Kamali; administrative, technical, and material support: Shahla Khosravan, Ali Alami and Mohammad Reza Mansoorian; study supervision: Shahla Khosravan.

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