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ORIGINAL ARTICLE

Health-promoting behaviors and social support in Iranian women of reproductive age: a sequential explanatory mixed methods study

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Abstract
Objectives The aim of this study was to determine health-promoting behaviors and their determinants including social support and sociodemographic characteristics as well as to explore women's experience of health-promoting behaviors.
Methods This sequential explanatory mixed methods study was conducted in two phases. The first phase was a cross-sectional study conducted on 1,359 women. Questionnaires, including items on sociodemographic characteristics, the HPLP-II and the PRQ85-Part2, were completed by interview. In the second phase, 15 women who were identified as extreme cases participated in individual in-depth interviews.
Results The results of the quantitative phase showed that women obtained the highest scores on interpersonal relations and the lowest scores on physical activity. Scores on the HPLP-II and all its subscales correlated significantly with the level of social support. In the qualitative phase, factors affecting health-promoting behaviors were explored and grouped into four main categories that included personal and socio-environmental barriers as well as personal and socio-environmental facilitators.
Conclusions The findings from this study confirm the importance of social support and modifiable variables (sociodemographic) that play a role in the health-promoting behaviours of women. These results will be useful in designing suitable interventions and strategies for the promotion of women's health.

Keywords Health-promoting behaviours · Social support · Women of reproductive age · Mixed methods study

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Introduction

Because they are known to be underlying factors in disease prevention and improvement of quality of life, health-promoting behaviors are among the main determinants of individuals' health (Mo and Winnie 2010). The relationship between social support and health-promoting behaviors in women is complex and not widely studied. Evidence from psychological research suggests that the support offered by others may sometimes be ineffective or even have negative effects. Several studies found no relationship between social support and health-promoting behaviors (Chantelle and Nancy 2008), while others reported that such a relationship existed (Adams et al. 2000; Chen et al. 2007).

Due to the rapid changes in fertility rates in recent decades in Iran, women of reproductive age comprise the

majority (60 %) of the total female population in that country (Statistical Center of Iran 2006). In addition to obvious gender differences in the susceptibility to conditions related to reproductive health, comprising pregnancy and childbirth, conditions such as anemia, depression, anxiety and eating disorders are more common in women (WHO 2001). Risk factors such as physical inactivity and obesity, which predispose one to various diseases, are prevalent among Iranian women (Amin-Shokravi et al. 2011; Bakhshi et al. 2012); so too are mental disorders. A mental health survey conducted in Iran showed that 25.9 % of women had mental disorders (Noorbala et al. 2004). In another study, Iranian women reported significantly poorer health-related quality of life compared to men (Tajvar et al. 2008). Health-promoting behaviors have been identified as an effective preventative measure against health problems and a means of improving women's health (Amin-Shokravi et al. 2011).

Pragmatism, which is a paradigm within mixed methods (MM) research, is a well-developed and attractive philosophy suitable for integrating perspectives and approaches (Johnson et al. 2007). The use of pragmatism could yield in-depth and rich findings regarding health-promoting behaviors among women. Most studies on health-promoting behaviors have employed a quantitative approach. As a result, there is limited availability of qualitative research on women's experiences of health-promoting behaviors and social support. Moreover, none of the studies have used the MM approach to gain a better understanding of health-promoting behaviors as well as their relationship with the social support given to women of reproductive age. The aim of this MM study was to investigate the extent of health-promoting behaviors and their determinants, inclusive of social support and sociodemographic characteristics. Furthermore, women's experiences with health-promoting behaviors were explored.

Method

Study design

To answer the research questions, the investigators used the MM approach with the sequential explanatory design including two phases. In the first phase, the status of health-promoting behaviors and their relation to social support was evaluated by collecting and analyzing quantitative data. In the second phase, women's experiences with the effective elements of health-promoting behaviors were explored by collecting and analyzing qualitative data, which helped to explain the quantitative findings. The quantitative and qualitative phases were connected when the participants were selected. Likewise, the interview protocol for the qualitative phase was based on the results of the statistical tests in the first phase. Furthermore, the findings of the quantitative and qualitative phases of the study were combined. Figure 1 shows the diagram of this study.

Ethical approval was provided by the Ethics Committee of the Tehran University of Medical Sciences. Written informed consent was obtained from each participant. The protocol of the study has been published elsewhere (Baheiraei et al. 2011).

Phase 1: quantitative phase

Data collection

This is a population-based cross-sectional study involving 1,359 women in Tehran (the capital of Iran). The eligibility criteria were as follows: Iranian nationality, able to respond to the questions, residing in Tehran, aged 15–49 years, and neither pregnant nor in the puerperium period. Participants were recruited using multistage cluster sampling. Tehran is the most populous city of Iran, with 12 million inhabitants including 3.8 million women of reproductive age (Statistical Center of Iran 2006). It is divided into 22 municipal districts, 2,400 domains and 30,218 blocks. Initially, 136 domains were selected using probability sampling weighted with the number of families in each district, and one block was selected at random from each domain. Subsequently, ten eligible women from ten households were selected from each block using systematic sampling. If there was more than one woman in a household, one of them was selected randomly. All participants were interviewed individually in their homes by a team of female interviewers. They were trained to administer the questionnaire in a standardized procedure. The survey was conducted anonymously. In order to be able to invite selected women to participate in the qualitative phase, phone numbers of all participants were recorded in the first phase. The response rate for the study population was approximately 90 %. If a woman was not at home three times at different times of day or was unwilling to participate in the study, the interviewer would go to the next home to the right. Each interview lasted on average 30 min. Implementation of this study was completely monitored by the supervisor team.

Data were collected using questionnaires, including sociodemographic characteristics, Health-Promoting Lifestyle Profile-II (HPLP-II) and Personal Resource Questionnaire 85-Part 2 (PRQ85-Part2). Sociodemographic characteristics included age, marital status, education, occupation, sufficiency of income for expenses, primary support source, crowding index, body mass index (BMI), as well as the spouse's level of education and occupation for married

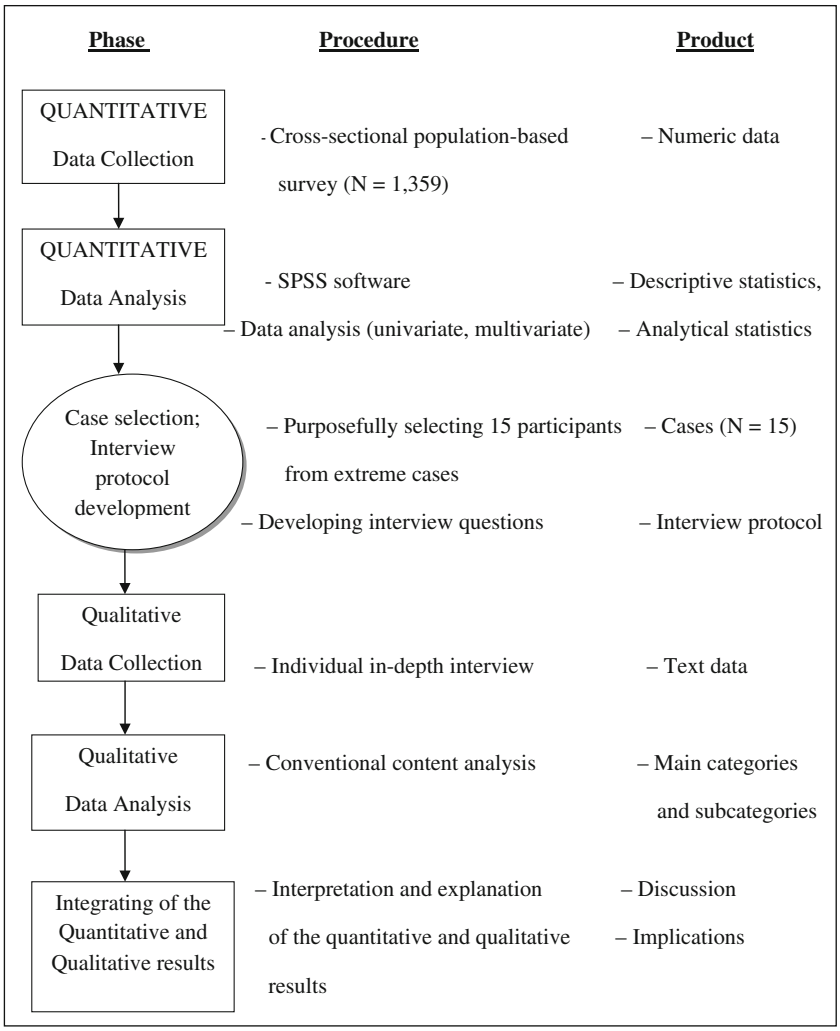

Fig. 1 Diagram of the study (Tehran, Iran, 2011)

participants. The crowding index was calculated by dividing the number of family members by the number of rooms, not considering the bathroom. The crowding index was categorized into three levels: low crowding (less than 2 people per room), average crowding (2–3 people per room) and high crowding (more than three people per room) (Tamim et al. 2007). The BMI was determined using height and weight. The BMI values were categorized as less than 18.5, 18.5–24.9, 25–29.9 and ≥30 (WHO 2006).

The HPLP-II questionnaire consisted of 52 items on the six aspects including nutrition, physical activity, spiritual growth, health responsibility, stress management and interpersonal relations. All items were scored from 1 to 4 (1 = never, 2 = sometimes, 3 = often, 4 = routinely) using the Likert scale (Walker et al. 1987). In this study, the indices of Cronbach's α and the intra-class correlation coefficient (ICC) for HPLP-II were 0.9 and 0.89, respectively, and varied from 0.66 to 0.76 and from 0.79 to 0.9 for the subscales, respectively. The PRQ85-part2 questionnaire was used to assess perceived social support. The 25-item questionnaire was based on a 7-point Likert scale, ranging from "strongly disagree" to "strongly agree"; the scores ranged from 25–175 (Weinert and Brandt 1987). In the present study, the Cronbach's α and ICC were 0.84 and 0.9 for this scale, respectively.

Statistical analysis

Data were analyzed using SPSS software 16. At first, univariate analysis using Pearson's correlation and one-way ANOVA tests was done to investigate the relationship between HPLP-II with social support and sociodemographic characteristics, respectively. Then, independent variables with $p < 0.2$ on univariate analysis were entered backward on the multiple linear regression model to predict the impacts of each of the independent variables (social support and sociodemographic characteristics) on the

dependent variables (HPLP-II) and to determine the variance.

Phase 2: qualitative phase

Study design

The second phase of this study was qualitative research with a conventional content analysis approach (Hsieh and Shannon 2005).

Participant selection

Extreme cases were sampled to purposefully select participants on the basis of their HPLP-II score. Women whose health-promoting behavior scores were in the 10th and 90th percentiles, who could also describe their experiences regarding health-promoting behaviors, were selected for interviews. Eight participants whose scores on health-promoting behaviors were among the highest 10 % and seven participants whose scores were among the lowest 10 % were interviewed. Sampling continued until data saturation was achieved. Each interview took approximately 1 h. The average length of the interviews was the same for individuals in both extremes of the sample.

Data collection

Individual, in-depth semi-structured interviews were used for data collection. The corresponding author conducted the interviews. The participants were first asked general, open-ended questions, such as 'What do you do to preserve and promote your health?' and 'In your case, what factors influence these actions and behaviors?' Then, they were asked a focused question regarding the effects of the factors: 'How do these factors influence your health?' As the interview progressed, in-depth exploratory questions—such as 'What do you mean?', 'Why?', 'Could you elaborate?' and 'Would you please give an example to help us better understand your meaning?'—were presented on the basis of the interviewees' responses so as to enhance the depth of the women's accounts of their experiences. During the interview, the author recorded non-verbal data, such as the participant's tone, facial expressions and position, as well as the time and location of the interview on a special sheet. The interviews were conducted at venues identified as convenient by participants, such as parks, homes and the university.

Data analysis

MAXQDA software (version 10) was used for data management. Each interview was subsequently transcribed verbatim; all interviews were recorded on tapes. The transcribed interviews were read several times. The meaning units related to health-promoting behaviors were subsequently identified. Participants' accounts yielded meaning units that, in turn, led to the identification of codes. These codes were classified into main categories and subcategories according to differences and similarities. In order to increase the trustworthiness of the data, rapport was established with the participants, and sufficient time was allocated for data collection. Interview transcripts and the codes derived from each interview were subsequently presented to the participants. They were asked for their views about the nature and meaning of the codes; in instances where they expressed opposing views, the codes were corrected accordingly. In addition, interview texts were presented to some researchers who were not directly involved in the study but served as external observers. These researchers were asked to check the accuracy of the coding process.

Validity

The validity of an MM study relates to both the quantitative and qualitative phases. An attempt was made to minimize potential validity threats through the use of a large sample size for the quantitative phase, selecting extreme cases on the basis of results obtained in the quantitative phase for follow-up in the qualitative phase, as well as ensuring and focusing on the validity of the two phases (Creswell and Clark 2011).

Results

Quantitative phase

The mean age of the participants was 31.9 ± 9.5 years. Over one-third of the participants (39.8 %) were aged 35 years or older. Of the total number of women who participated, 70.8 % were married, and 64.1 % were housewives. Almost three-quarters (71.2 %) had a diploma or university education. Further, almost 70 % stated that their monthly income covered their expenses, to some extent, while 46.6 % did not live in over-crowded homes. For almost two-thirds of the married women, the primary source of support was the spouse. Two-thirds of the spouses (67.1 %) had a diploma or higher education, and more than one-third (43.4 %) worked in the private sector. About half of the women had normal BMIs (18.5–24.9). The average BMI was 25.3 ± 5.

As shown in Table 1, the mean total HPLP-II score was 2.78 ± 0.40. The participants obtained the highest scores in interpersonal relations (3.08 ± 0.51) and the lowest in

Table 1 Means and standard deviation for Health-Promoting Lifestyle Profile-II and its subscales and their association with perceived social support (Tehran, Iran, 2011)

Variable	Mean	SD[a]	R[b]
HPLP-II[c]	2.78	0.40	0.53*
Nutrition	3.07	0.53	0.40*
Physical activity	2.04	0.64	0.12*
Spiritual growth	3.04	0.58	0.56*
Health responsibility	2.62	0.58	0.29*
Interpersonal relations	3.08	0.51	0.38*
Stress management	2.72	0.56	0.60*

* $p < 0.001$

[a] Standard deviation

[b] Association coefficient between the variables and perceived social support resulting from Pearson's correlation test

[c] Health-Promoting Lifestyle Profile-II

Table 2 Multivariable linear regression analysis for factors associated with Health-Promoting Lifestyle Profile-II overall score (Tehran, Iran, 2011)

Variables	β (95 % CI)	*p*	R^2
Social support	0.012 (0.011–0.013)	<0.001	0.28
Education			
University	0		0.018
Illiterate	−0.12 (−0.34 to 0.09)	0.28	
Elementary	−0.09 (−0.19 to 0.01)	0.08	
Secondary school	−0.09 (−0.16 to −0.00)	0.04	
High school	−0.20 (−0.31 to −0.09)	<0.001	
Diploma	−0.09 (−-0.14 to −0.03)	0.004	
Crowding index[a]			
Low	0		0.005
Average	−0.03 (−0.08 to 0.02)	0.28	
High	−0.09 (−0.17 to −0.01)	0.02	

CI confidence interval

[a] A crowding index was ascertained by dividing the number of family members by the number of rooms

physical activity (2.04 ± 0.64). The mean score of perceived social support was 134.3 ± 17.9. A significant correlation was found between the social support score and the overall score on health-promoting behaviors and accompanying domains.

Univariate analysis yielded an overall HPLP-II score that correlated significantly with education, the spouse's education, the primary source of support ($p < 0.001$) and sufficiency of income to cover expenses ($p < 0.05$). Social support, education, the husband's occupation, sufficiency of income to cover expenses, the crowding index and the primary source of support were all entered into the backward multivariable linear regression model in order to identify factors that have an effect on health-promoting behaviors. Social support, education and the crowding index remained in the model and predicted 30.3 % of the variance in the overall score on the HPLP-II (Table 2).

Qualitative results

Using content analysis of data from the interviews and the field notes, 116 codes and 12 subcategories were extracted and classified into four main categories: personal barriers, socio-environmental barriers, personal facilitators and socio-environmental facilitators (Table 3).

Personal barriers referred to personal factors that were preventing participants from engaging in health-promoting behaviors. Participants frequently mentioned lack of time as a barrier to health-promoting behaviors. For example, one woman stated:

> If we don't have time to prepare food, we will order it from restaurants [p. 3].

School or work duties were another personal barrier preventing women from engaging in health-promoting behaviors. Another participant made the following statement:

> A major barrier for me is that I am at work until 5 p.m. every day and become tired, so I do not exercise [p. 5].

Lack of preparation and motivation served as another personal barrier preventing women from engaging in health-promoting behaviors. Participants further indicated personal characteristics such as indolence, lack of interest or lack of appetite as barriers. For example, one respondent stated:

Table 3 Classification of main categories and subcategories (Tehran, Iran, 2011)

Main categories	Subcategories
Personal barriers	Lack of time
	School and work duties
	Lack of preparation and motivation
	Physical disability
Socio-environmental barriers	Family responsibilities
	Environmental pressure
	Financial constraints and costs
Personal facilitators	Personal interests and motivation
	Experience of disease
Socio-environmental facilitators	Family and social-support networks
	Encouraging and motivating environment
	Media and public education

> Honestly, I am lazy, and there is nothing more. My body needs exercise due to hypercholesterolemia, but I am too lazy to do it [p. 6].

Physical complaints were reported as another barrier to health-promoting behaviors. One participant stated:

> For example, I had a corn on my foot due to too much walking, and about a month ago I had a minor surgery to remove it [p. 2].

Social barriers were indicated as another main category of factors that prevent health-promoting behaviors. Aspects related to family responsibilities that were regarded as barriers preventing women from engaging in health-promoting behaviors included childcare, family problems and diseases, disagreements with spouses and family disputes. For example, one respondent described family problems and diseases as a barrier to mental health:

> Family problems make the most powerful people angry and sad and cause them to lose their mental health. My dad's illness makes me angry sometimes; problems have occurred for my loved ones [p. 3].

Another social barrier was environmental pressure; for example, bad weather conditions, socio-cultural expectations, poor pool hygiene and inappropriate club schedules were mentioned as environmental barriers to health-promoting behaviors, especially exercise. For example, one participant said:

> In Tehran the weather is so bad that people prefer to stay at home. Tehran does not have good weather, which deters people from exercising. [p. 5].

Most participants reported financial constraints and costs as factors that discourage health-promoting behaviors, particularly exercise. For example, one participant said:

> The clubs' prices have risen and this is a barrier to their use [p. 5].

Another main category was personal facilitators. Participating women frequently spoke about their interests and personal motivation as a facilitating factor. For example, one participant said:

> When I want to think about my future, when I think about anything that makes me successful, I say that I have to have a healthy body and mind, and if I want to have these I have to have a healthy diet [p. 1].

Personal experience of a disease was another personal facilitator encouraging women to engage in health-promoting behaviors. For example, a woman who was a lupus patient said:

> I exercise to have a better emotional state and not be sad about my life, and so my illness does not hurt me [p. 5].

Socio-environmental facilitators included familial-social factors. Family and social supports were indicated as factors affecting health-promoting behaviors. The roles of the spouse and family members in the level of health-promoting behaviors that participants engaged in were regarded as an important social factor; most of the participants emphasized the nature and support received from their families and spouses. They described three main aspects of social support, namely emotional (e.g., feeling loved, valued and appreciated), informational (e.g., advice or guidance) and instrumental (e.g., tangible help). One of the women said the following about the informational support given by her family in relation to acquiring appropriate eating habits.

> My family told me about appropriate foods for health, and I used their experiences [p. 4]

One of the participants stated the following about the emotional support given by the family in relation to exercise.

> My family, especially my father, always encouraged me to exercise. He always said that I am proud of my daughter. So I became happy and I was a more active participant in sports [p. 11].

A woman identified her husband as an emotional supporter of her health-promoting behaviors:

> My husband takes care of me and my health. He worries even more than me. He always encourages me to exercise, and even comes with me for a walk [p. 6].

Another socio-environmental facilitator was having an encouraging and motivating environment. For example, a participant reported that religious beliefs and the living environment influence exercising:

> I was an athlete from adolescence because there was no other recreation in our small city and our family's religious beliefs propel us to engage in healthy activities. Especially the fact that my mother was a teacher and always said that exercise is the best activity for teenagers [p. 2].

The women further indicated the media and public education as social facilitators. For example, one respondent stated:

> Media such as magazines and newspapers have informed me about bad food; for example, they said that fast foods are not appropriate nutrition [p. 4].

Discussion

This was the first study in Iran to use an MM approach to evaluate health-promoting behaviors and associated factors among women of reproductive age. Based on the results obtained in the quantitative phase, social support, education level and the crowding index were identified as factors that had the most influence on health-promoting behaviors. In the qualitative phase, which yielded data on participants' experiences of health-promoting behavior, personal and socio-environmental inhibitors, as well as facilitators, were recognized as the main categories of health-promoting behaviors.

One of the main findings of this study is the fact that women obtained the highest score in the subscales tapping on interpersonal relations, spiritual growth and nutrition. However, women obtained the lowest score in physical activity, which is consistent with findings in other studies conducted in the Middle East. Similarly to this study, nursing students in Kuwait (Al-Kandari and Vidal 2007) as well as university students (Alpar et al. 2008) and academic staff in Turkey (Pirincci et al. 2008) obtained the highest score in the spiritual growth, interpersonal relations and nutrition domains. However, these groups obtained the lowest score in the physical activity domain, which may be due to the similarity of cultures shared between the two countries. A sedentary lifestyle is a challenge in most countries. The analysis of data on participants' experiences showed that lack of time, school or work duties, lack of preparation or motivation, physical disability, family responsibilities, environmental pressures, and financial constraints and costs were described as deterrents to physical activity. Some of these deterrents have also been reported in other qualitative studies (Inglis et al. 2005; Timmerman 2007; Nuss et al. 2004; Abildso et al. 2010). For example, lack of time due to busy lesson schedules, emphasis of parents on academic success over exercise, and lack of time in general because of responsibilities related to the family and the social environment were most frequently cited as barriers to physical activity (Daskapan et al. 2006). However, the description of environmental pressure as a barrier was unique to this study. The findings obtained in the quantitative phase of this study showed that an increase in social support, as perceived by the participating women, was significantly associated with a better inclination toward engaging in health-promoting behaviors. These findings were confirmed by those obtained in the qualitative phase of the study. According to the women's accounts of their experiences, families and social support networks are some of the factors that facilitate health-promoting behaviors. Many of the participants stated that the social support received from family and friends encouraged them to engage in health-promoting behaviors. Previous studies have also indicated that social support has a positive influence on health-promoting behaviors (Chen et al. 2007; Adams et al. 2000; Tang and Chen 2002). Education levels were also identified as predictors of health-promoting behaviors in the current study. This is consistent with findings from previous studies, which have also indicated the importance of education (Pirincci et al. 2008; Tang and Chen 2002; Adams et al. 2000). This result emphasizes the impact of higher education on an individual's observance of health-promoting behaviors. In the qualitative phase, public education and the media were identified as socio-environmental facilitators of health-promoting behaviors. This was especially true for participants with a background in academic education

As determined in other studies (Chambers et al. 2010; Hambleton et al. 2005), overcrowding of the household, as found in the quantitative phase of the study, has a negative effect on health-promoting behaviors. Overcrowding serves as a barrier to individuals' ability to make healthy choices and practise health-promoting behaviors (Chambers et al. 2010). An explanation for this is that families with a high crowding index usually face greater financial pressures and difficulties; this is especially so when taking into account participants' reference in the qualitative phase to financial constraints and costs as deterrents to health-promoting behaviors.

The women who participated in the qualitative phase of the present study stated that the air pollution in Tehran, social and cultural conditions, as well as unsuitable schedules at sports facilities, especially for employed women, were barriers to health-promoting behaviors, such as exercise. Underlying barriers to health-promoting behaviors among Iranian women could include issues such as immigration to metropolitan areas and rapid urbanization; a rapid increase in the rate of education among women, as well as related duties; women's employment outside the home; men being not willing to share housework and child-rearing responsibilities; and the lack of adequate social-support infrastructure, such as suitable kindergartens and appropriate sports facilities.

The integration of data obtained in the quantitative and qualitative phases, as well as using the Nominal Group Technique (Baheiraei et al. 2013), enabled us to provide strategies for advancing health-promoting behaviors among women of reproductive age. In order to improve health, special attention must be paid to the factors that influence health-promoting behaviors. Seemingly, beneficial interventions in this regard include the provision of social support and comprehensive information on health-promoting behaviors through various educational channels, as well as incentives and a motivating environment.

Since the quantitative phase of this study was cross-sectional, the possibility of there being confounding factors cannot be completely eliminated. However, the use of a mixed methodology compensated for this lack of control and any possible threats to internal validity. Through the qualitative component of the study, participants could explain the effectiveness of various factors on health-promoting behaviors, as directly experienced by them, and not a result of other potentially confounding influences. Moreover, most of the participants in the quantitative phase had a diploma or a university education. Although results of the last census (Statistical Center of Iran 2011) also shows that most of women of reproductive aged living in the city have higher education, results of the quantitative phase of this study may not be generalizable to women with little or no education. However, both highly and less educated women were interviewed in the qualitative phase to explore effective factors on health-promoting behaviors from their views. As is typical of qualitative studies, the findings obtained in the qualitative phase of the present study have a low potential for generalization, especially since the study was conducted on a limited number of women of reproductive age in Tehran. Thus, a quantitative comparative study is suggested to be conducted among women with different educational levels regarding health promotion behaviors. Finally, the specific geographic, demographic and socio-economic characteristics as well as the cultural environment of Tehran, as a capital city and one of the most populated cities in Iran, make it difficult to generalize these findings to other places.

Conclusion

The findings obtained in the two phases of the study confirm the importance of social support and socio-demographic variables in the development of health-promoting behaviors in women. Therefore, we must adopt a holistic approach toward any effort aimed at encouraging health-promoting behaviors among women as well as acknowledge behavior as a consequence of the interaction between personal characteristics (i.e., biological and psychological) and environmental factors (i.e., social factors and facilities, or the physical environment). The results from the present study could be used to inform interventions and strategies by policy-makers, planners, managers, researchers and healthcare providers so as to improve women's health behaviors, thus contributing to their wellbeing.

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