



ORIGINAL ARTICLE

Health-promoting Lifestyles and Related Factors in Pregnant Women

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ABSTRACT

Introduction: Health-promoting behavior increases the self-care of the individuals and improves the health. It reduces the chance of maternal and fetal harm during pregnancy. The objective of this study was to determine the sociodemographic factors related to health-promoting self-care behavior in Iranian pregnant women categorized by domains. **Materials and Methods:** A cross-sectional study design with convenience sampling was used to recruit 384 pregnant Iranian women that were referred to the health center in Sari in 2014-2015. Self-reporting questionnaires included sociodemographic characteristics and health-promoting lifestyle profile-II questionnaires. Data were analyzed with using the statistical package for the social sciences software (version19). One-way ANOVA and chi-square tests were used to determine the relationship between the sociodemographic characteristics and health-promoting behaviors. **Results:** The mean age of pregnant women was 27.65±4.753 years. Most of the participants were in the second trimester of pregnancy. The mean of the total score for health-promoting behaviors was 142.96±17.947. Among the six dimensions of health-promoting behaviors, the interpersonal relations scored maximal, and the physical activity scored the lowest. Significant correlations existed between spirituality and the wife's education, the wife's job, and the family income. In addition, a significant correlation was established between stress management and the wife's education, also between the aspect of relationships and the husband's education, the wife's education, the family income, and the decision maker (all $P < 0.005$). **Conclusion:** The findings of the present study confirmed that the sociodemographic factors were vital in health-promoting behaviors in pregnant women.

INTRODUCTION

According to the World Health Organization (WHO), the health-promoting behavior refers to empowering the individuals in order to increase the self-control and improve the health (1). The six aspects of health-promoting behaviors include stress management, nutrition, physical activity, psychological health, and interpersonal relations (2). Previous studies have shown that the health-promoting self-care behaviors increase the prevention of disease, maintenance and improvement of general health in individuals, families, and society, and increases the self-confidence, motivation, and self-efficiency in a person (3, 4). Some other studies have shown that <5% of the population exhibited high-level of health-promoting behaviors (5, 6). Importantly, women experience biological changes, such as pregnancy and

breastfeeding during their lives, and hence, should follow a healthy lifestyle and improve the health-promoting behaviors in their lives, especially during pregnancy (2).

The health-promoting self-care behaviors during pregnancy decrease the chance of preterm labor, cesarean section, and the probability of obesity and diabetes in the baby in the future (7-11). On the other hand, lack of attention to such behaviors causes bleeding and infection in the mother and increases the intensive care unit (ICU) stay (8), low birth weight, and premature death in infants (9).

In a study on Turkish woman, Bahar et al. (2015) showed that women gain the highest scores with respect to interpersonal support and self-actualization, and lowest in sports (12). Also, Lin et al. (2009) showed that pregnant women had a medium level of health-promoting self-care behavior (2). Some of the sociodemographic factors related to health-pro-

moting behaviors include the mother's age, the education of the couple, the family income, and the mother's job (13-15). A study conducted by Tesfay et al. demonstrated that the family income was positively correlated with health-promoting self-care behaviors (16), while Lin et al. showed that individuals with the income level of two and four had higher self-care behaviors than those with level five (2). Considering that one of the factors affecting the health-promoting behaviors is the dominant culture of the society, the goal of this study was to determine the sociodemographic factors related to health-promoting self-care behaviors in pregnant women categorized by the domains in the Sari city in northern Iran.

MATERIALS AND METHODS

A cross-sectional study design used the quota sampling method to assimilate 385 Iranian pregnant women, aged 16–41 years, referred to the health center in Sari city in northern Iran in 2014-2015. The inclusion criteria were that pregnant Iranian women with the least education level of elementary education up to grade three and those who were trend were entered into the study. Hospitalized and non-Iranian women were excluded to avoid different culture and to reduce the confounding factors. The sample size calculated based on the largest standard deviation of the subscales in a previous study was 20 (17). $Z=1.96$, $d=2$, $\delta=20$.

$$n = \frac{z_{(1-\frac{\alpha}{2})}^2 \times \delta^2}{d^2} = 384$$

In order to determine the research location, eight clinics were selected of the thirteen health centers in Sari city according to the geographical location. Based on the number of households encompassed by each center, one clinic was in the west, two centers in the east, two in the south, one in the north, and two were in the city center. The quota of each center was determined based on the number of pregnant women referred to the health center in the previous year. The Ethics Committee in the Mazandaran University of Medical Science (ethical code: 115) approved the present study. The participants were provided adequate information about the research and written informed consent was obtained.

Research Tools: In this study, data were collected by two questionnaires:

- 1) The sociodemographic questionnaire included age, education, job, economic status, number of household members, body mass, and the job and education of the spouses of the participants.
- 2) The health-promoting behavior questionnaire. The original version of this questionnaire was developed by Walket et al. (1987) based on the Pender model to assess the health-promoting behaviors. This questionnaire contained 52 items and 6 dimensions that assessed the nutrition, physical activity, spiritual growth, responsibility for health, stress control, and interpersonal relationships.

All items were scored as 1–to 4 (1=never, 2=sometimes, 3=often, 4= always) according to the Likert scale. The score of each aspect was obtained individually, and an overall score was also obtained for all the aspects. This questionnaire in-

cluded nine questions about spiritual growth, nine about health responsibility, eight about stress control, and nine about interpersonal relationships (18). Notably, the content of the Farsi version of this tool was validated by Mirqafurvand et al. Subsequently, the correlation coefficient and Cronbach's alpha index were determined to be 0.9. The answers ranged from 52 to 208 (19). In the present study, scores <25% were lack of self-care (score <52), 25–50% were low self-care (score 104–155), 50–75% were medium self-care (score 104–155), and $\geq 75\%$ were good self-care (score ≥ 156).

Analysis: Data were analyzed using software the statistical package for the social sciences (SPSS, v. 19) software. Sociodemographic characteristics and health-promoting were expressed as frequency, percentage, mean, and standard deviation. One-way ANOVA of variance (post-hoc) and chi-square tests were used to determine the correlation between sociodemographic characteristics and health-promoting behaviors.

RESULTS

The mean age of the pregnant women was 27.65 ± 4.753 years. Half of the participants (51.6%) had high school and associate degrees, and most of them (77.7%) were housewives. A total of 45.6% of participants had a medium level of income. The percentages of the participants according to their first, second, and third trimesters were 22.5%, 45.9%, and 31.6%, respectively, indicating that the majority of the women were in the second trimester. Most of the women had the body mass index (BMI) between 25 and 29.9. Half of the spouses (50.3%) were high school graduates and college graduates, and most of them (74.1%) were self-employed. Furthermore, 94% of the participants belonged to a household of 2-3 people. A majority of the participants (79.53%) of the participants declared that they made important life decisions together with their spouses. The individual characteristics of the participants are presented in Table 1.

Health-promoting behavior: The mean of the total score for health-promoting behaviors was 142 ± 17 . The score for the participants was highest for the interpersonal relationships (3.05 ± 3.885) and the lowest for the physical activity (2.075 ± 3.967), while that for nutrition was 2.98 ± 3.663 , spirituality 2.95 ± 4.028 , responsibility 2.76 ± 4.093 , and stress management 2.628 ± 3.408 (Table 2).

ANOVA established a significant negative correlation between the less age and the score of the health-promoting behaviors. Thus, those aged 15–24 years had a lower total score for the health-promoting behaviors than the other groups. Furthermore, a negative correlation was established between the BMI and health-promoting behaviors, albeit not statistically significant. A positive and significant correlation was established between female education and the score of health-promoting behaviors, indicating that the total score of health-promoting behaviors in less qualified individuals is lower than that in the other groups. The level of education of men also had a positive and significant correlation with the score of the spouse's health-promoting behaviors. The women with less-educated husbands had a less score for the health-promoting behaviors. A positive correlation was established between male/female occupations and the score of health-promoting

Table 1. Sociodemographic characteristics of the participants

Characteristic	Frequency N (%) n=385
Age	
15-24	106 (27)
25-34	245 (63)
>35	34 (8)
Body mass Index	
<18.5	17 (4)
18.5-24.9	142 (36)
25-29.9	164 (42)
>30	62 (16)
Wife's education	
Lower than high school diploma	75 (20)
High school diploma and associate degree	199 (51)
Bachelor of arts	89 (23)
Master of art (MA) or PhD	19 (4)
Husband's education	
Lower than high school diploma	96 (24)
High school diploma and associate degree	194 (50)
Bachelor of arts	78 (20)
Master of art (MA) or PhD	17 (4)
Household population	
2-3	376 (95)
4-5	16 (4)
>5	2 (1)
wife's job	
Government employee	29 (7)
Student	19 (4)
Self-employment	37 (9)
Housekeeper	300 (77)
Husband's job	
Government employee	89 (23)
Student	7 (1)
Self-employment	276 (84)
Unemployed	3 (2)
Economic status	
Good	125 (32)
Medium	176 (45)
Weak	84 (21)
Pregnancy trimesters	
First trimester (1-14 weeks)	86 (22)
Second trimester (15-28 weeks)	177 (45)
Third trimester(<29 weeks)	122 (31)
Decision maker	
Myself	6 (1)
My husband	67 (17)
Together	307 (79)
Others	5 (1)

Table 2. Mean and standard deviation for HPLP-II and subscales

Variable	Mean	SD
HPLP-II 2	142	17
Nutrition	2.98	3.663
Physical activity	2.075	3.967
Spiritual growth	2.95	2.028
Health responsibility	2.76	4.093
Interpersonal relations	3.05	3.885
Stress management	2.628	3.408

HPLP-II; Health-promoting Lifestyle Profile-II, SD; Standard Deviation.

behaviors such that the unemployed individuals scored lower than the other groups. A positive and significant correlation was established between the decision maker in the family and the score of health-promoting behavior; thus, when the decisions are made jointly, the score for the health-promoting behaviors increases. Also, a positive and significant correlation was observed between the family population and the score of health-promoting behaviors, such that families with more children reported high health-promoting behavioral scores. A positive and significant correlation was established between the economic status of the family and the score of the health-promoting behaviors; thus, the high economic status improves the score of health-promoting behaviors (Table 3).

Nutrition: Significant correlations were established between nutrition and the wife's education ($P<0.001$), the husband's education ($P<0.001$), the husband's job ($P=0.008$), and the family income ($P<0.001$). However, no significant correlations were established between the wife's job, the wife's age, the pregnancy trimesters, BMI, household population, and the decision maker in the relationship.

Exercise: Significant correlations were noted between the aspect of exercise and the wife's education ($P=0.009$) and the wife's job ($P=0.041$). However, no significant correlations were observed between the spouse's job and education, the woman's age, the pregnancy trimesters, BMI, household population, and the decision maker in the relationship.

Relationship: Significant correlations were established between responsibility and the wife's education ($P<0.001$), the spouse's education ($P=0.001$), the family income, ($P<0.001$), and the decision maker ($P=0.025$). However, no significant correlations were established between the wife and the spouse's jobs, the wife's age, the pregnancy trimesters, BMI, and the household population.

Spirituality: Significant correlations were noted between spirituality and the wife's education ($P<0.001$), the wife's job ($P=0.017$), and the family income ($P=0.001$). However, no significant correlations were observed between the spouse's job and education, the wife's age, pregnancy trimesters, BMI, household population, and the decision maker.

Stress management: A significant correlation was observed between stress management and the wife's education ($P=0.04$); however, no significant correlations were established between the spouse's job and education, the wife's age, the wife's education, pregnancy trimesters, BMI, household population, and the decision maker in the relationship.

Interpersonal relationships: Statistically significant correlations were established between the relationship and the husband’s education ($P=0.002$), the wife’s education ($P=0.000$), the family income ($P<0.001$), and the decision maker ($P=0.001$). However, no significant correlations were detected between the wife’s and the husband’s jobs, the wife’s age, pregnancy trimesters, BMI, and the household population (Table 3).

DISCUSSION

The purpose of this study was to investigate the sociodemographic factors related to the health-promoting self-care behaviors categorized by domains in pregnant women in Iran. These findings showed that among the investigated aspects in pregnant women, f relationships scored maximum, which was in agreement with the study by Mirqafurvand et al. (2014), Lin et al. (2009) (2, 19).

The current study demonstrated that the interpersonal relationship is related to the education of the husband and the wife, the family income, and the decision maker.

Also, Mirqafurvand et al. (2014) showed that the education level of the wife and the husband was related to the aspect of the relationships which was also observed in the current study; however, the phenomenon differed in the aspect of BMI (19). This lack of similarity between our study and that by Mirqafurvand et al. in the aspect of BMI might be attributed to the statistical differences in the population.

In the present study, significant correlations were observed between the aspect of nutrition and the wife’s and husband’s education, the husband’s job, and the family income. Moreover, Mirqafurvand et al. (2014) demonstrated that the aspect of nutrition was related to the wife’s and husband’s education, the woman’s job, and the family income but not related to the husband’s job. Daba et al. (2013) showed that the woman’s job and the household population were related to the aspect of nutrition but not related to the wife’s and husband’s education and the income, which was not in agreement with the current study. Also, Bahar et al. (2015) did not show a significant correlation between the aspect of nutrition and the income, which differed from the current finding. This discrepancy might be attributed to the difference between the type of the study, the type of the questionnaire (20), and the statistical population (12, 19).

The present study showed that the aspect of spirituality was related to the wife’s education and job and the family income. In a study by Bahar et al. (2015), spirituality was related to the family income, which was similar to that in our study but differences were observed with respect to the age group (12). Also, Mirquafurvand et al. (2014) demonstrated that the wife’s job and education and the family income were related to spirituality which was in agreement with the current findings but differed with respect to the correlation between the wife’s age and spirituality (19). This conflict might have risen due to the difference in culture (12) and statistical population (19).

The present study showed that the aspect of responsibility was related to the wife’s and the husband’s education, the income, and the decision maker, while the study conduct-

Table 3. Correlation between HPLP-II and subscales in pregnant women with demographic factor

Variables	Health promoting behavior		
	F	DF	Sig
Age	0.000	2	0.001
15-24			
25-34			
>35			
Body mass index			
<18.5	2	3	0.098
18.5-24.9			
25-29.9			
>30			
Wife’s education			
Lower than high school diploma	9	3	0.001
High school diploma and associate degree			
Bachelor of arts			
Master of art (MA) or PhD			
Husband’s education			
Lower than high school diploma	4	3	0.002
High school diploma and Associate degree			
Bachelor of arts			
Master of art (MA) or PhD			
Household population			
2-3	1	2	0.001
4-5			
>5			
Wife’s job			
Government employee	3	3	0.01
Student			
Self-employment			
Housekeeper			
Husband’s job			
Government employee	0.000	3	0.001
Student			
Self-employment			
Unemployed			
Economic status			
Good	10	2	0.001
Medium			
Weak			
Pregnancy trimesters			
First trimester (1-14 weeks)	1	2	0.001
Second trimester (15-28 weeks)			
Third trimester (<29 weeks)			

(Contd...)

Table 3. (Continued)

Variables	Health promoting behavior		
	F	DF	Sig
Decision maker	3	3	0.021
Myself			
My husband			
Together			
Others			

HPLP-II; Health-promoting Lifestyle Profile-II .

ed on pregnant women by Moshki et al. (2012) showed that smoking was not related to the wife's and husband's education which did not agree with the findings in the current study (21). Furthermore, Azizmohammadi et al. (2014) reported that the education of the wife and husband was related to smoking during pregnancy (22), which was in agreement with the current study. The disagreement might be a result of the difference in tools utilized for gathering data.

In the aspect of stress management, this study showed a significant correlation between the wife's education and stress management. However, Moshki et al. (2012) did not deduce a correlation between the wife's education and stress management. Nevertheless, Bahar et al. (2015) showed that women's age group was related to stress management which was in disagreement with our study. These disagreements might be the result of differences in tools employed for gathering data (12, 21) and cultural differences (12).

In the aspect of physical activity, a statistically significant correlation was established between the wife's education and job. Furthermore, Mirqafurvand et al. (2014) showed a significant correlation between physical activity and the wife's education and job, which was in agreement with the current study. Also, Moshki et al. (2012) demonstrated that the mother's job was related to physical activity, which might be the reason for the alignment due to cultural similarity. One of the limitations of the current study is the study is the cross-sectional design that could not depict the causal correlation strongly, and therefore, additional qualitative studies are recommended.

CONCLUSION

The present study showed that pregnant Iranian women have moderate self-care behaviors with the highest score in the dimension of interpersonal relationships and the lowest for the physical activity. Since physical activity can balance the maternal weight and help reduce the maternal and fetal complications, it is recommended to encourage pregnant women to attend preparatory classes for physiological delivery.

IMPLICATIONS

The findings of this study could be used as a reference for prenatal care, nursing, education, and maternal/neonatal health policies.

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AUTHER CONTRIBUTIONS

All authors contributed equally in this study.

CONFLICT OF INTEREST

None.

ETHICAL STANDARDS

The Ethics Committee in the Mazandaran University of Medical Science (ethical code: 115) approved the present study.

REFERENCES

1. Charter B. The Bangkok charter for health promotion in a globalized world. *An Official Journal of the International Union for Health Promotion and Education*. 2006;21(S1):10.
2. Lin Y-H, Tsai E-M, Chan T-F, Chou F-H, Lin Y-L. Health promoting lifestyles and related factors in pregnant women. *Chang Gung Med J*. 2009;32(6):650-61.
3. Barry MM, Clarke AM, Jenkins R, Patel V. A systematic review of the effectiveness of mental health promotion interventions for young people in low and middle income countries. *BMC Public Health*. 2013;13(1):835.
4. Movahedi M, Znjry N, Sadeghi R. Social determinants - health promoting lifestyle in the elderly population (Case study of elderly people in Shiraz). *Journal of Population Association of Iran*. 2010;5(10):79.
5. Reeves MJ, Rafferty AP. Healthy lifestyle characteristics among adults in the United States, 2000. *Archives of Internal Medicine*. 2005;165(8):854-7.
6. Troost JP, Rafferty AP, Luo Z, Reeves MJ. Temporal and regional trends in the prevalence of healthy lifestyle characteristics: United States, 1994–2007. *American journal of public health*. 2012;102(7):1392-8.
7. Mourtakos SP, Tambalis KD, Panagiotakos DB, Antonogeorgos G, Arnaoutis G, Karteroliotis K, et al. Maternal lifestyle characteristics during pregnancy, and the risk of obesity in the offspring: a study of 5,125 children. *BMC pregnancy and childbirth*. 2015;15(1):66.
8. Heslehurst N, Simpson H, Ells L, Rankin J, Wilkinson J, Lang R, et al. The impact of maternal BMI status on pregnancy outcomes with immediate short-term obstetric resource implications: a meta-analysis. *Obesity reviews*. 2008;9(6):635-83.
9. McBride AJ, Williams ED, Sabo KP. Effects of Smoking vs. Nicotine Replacement Therapy During Pregnancy on Childhood Health Outcomes: An Integrative Literature Review. 2015.
10. Petrov Fieril K, Glantz A, Fagevik Olsen M. The effi-

- cacy of moderate-to-vigorous resistance exercise during pregnancy: a randomized controlled trial. *Acta obstetrica et gynecologica Scandinavica*. 2015;94(1):35-42.
11. Stanford KI, Lee M-Y, Getchell KM, So K, Hirshman MF, Goodyear LJ. Exercise before and during pregnancy prevents the deleterious effects of maternal high-fat feeding on metabolic health of male offspring. *Diabetes*. 2015;64(2):427-33.
 12. Bahar Z, Beşer A, Özbiçakçı Ş, Haney MÖ. Health promotion behaviors of Turkish women. *Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi*. 2014;6(1).
 13. Panthumas S, Kittipichai W, Pitikultang S, Chamroonsawasdi K. Self-Care Behaviors among Thai Primigravida Teenagers. *Global journal of health science*. 2012;4(3):p139.
 14. Baheiraei A, Mirghafourvand M, Charandabi SM-A, Mohammadi E. Facilitators and Inhibitors of Health-promoting Behaviors: The Experience of Iranian Women of Reproductive Age. *International journal of preventive medicine*. 2013;4(8):929.
 15. Azizmohammadi S AS, Alavi H. The Relationship between Drug Abuse in Pregnant Women and Pregnancy Complications in Shahid Akbarabadi Treatment-Training Center: 2009. *Nurse and Physician Within War*. 2014;3(23):29-33.
 16. Tesfay K GH, Bruh G, Fantahun A. Health promotion practice and its associated factors among pregnant mothers attending ANC services in public health institution of Mekelle City, Tigray, Ethiopia. *Science*. 2015;4(1):18-25.
 17. Anbari K, Mostafavi SM, Ghanadi K. Health Promoting Behaviors in Women of Khorramabad City in Western Iran in 2013. *Women's Health Bulletin*. 2014;2(1).
 18. Walker SN SK, Pender NJ. The health-promoting lifestyle profile: development and psychometric characteristics. *Nursing research*.
 19. Mirghafourvand M BA, Nedjat S, Mohammadi E, Charandabi SM-A, Majdzadeh R. A population-based study of health-promoting behaviors and their predictors in Iranian women of reproductive age. *Health promotion international*. 2014:dat086.
 20. Daba G BF, Garoma W, Fekadu H. Assessment of Nutritional Practices of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia. *Science, Technology and Arts Research Journal*. 2013;2(3):105-13.
 21. Moshki M BN, Sadegh Moghadam L. Lifestyle of pregnant women living in Gonabad (Iran). *Journal of Research & Health*. 2012;2(2):200-6.
 22. Azizmohammadi S, Azizmohammadi S, Alavi H. The Relationship between Drug Abuse in Pregnant Women and Pregnancy Complications in Shahid Akbarabadi Treatment-Training Center: 2009. *Nurse and Physician Within War*. 2014;3(23):29-33.