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Relationship between Health Promoting Lifestyle and Perceived Stress in Pregnant Women with Preeclampsia

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ABSTRACT

Introduction: Lifestyle during pregnancy has long-term effects on health of mother and child. Having previous illness or unexpected maternal or fetal conditions such as preeclampsia can complicate pregnancy and interfere with health-promoting behaviors and cause stress might interfere with health-promoting behaviors. This study was carried out to examine the relationship between health-promoting lifestyles and perceived stress in women with preeclampsia.

Methods: This study is a descriptive correlation design that was conducted on 182 pregnant women with preeclampsia attending in the high risk clinics of Al-Zahra and Talegani hospitals in Tabriz 2014. Data gathering tools were three: demographics, health-promoting lifestyle (HPLP-II), and perceived stress questionnaires. SPSS Ver. 13 was used for data analysis.

Results: The mean (SD) of health promoting lifestyle among pregnant women with preeclampsia was 2.4 (0.4). Among the dimensions of health promoting life style, the highest mean score was for sub domain of nutrition, i.e. 2.8 (0.5), and the lowest score was achieved by the sub-domains of physical activity, i.e. 1.5 (0.5). The mean (SD) score of perceived stress was 27.3 (7.1). There was reverse relationship between perceived stress and health -promoting behaviors.

Conclusion: Based upon the results, health promoting behaviors were decreased by increment of perceived stress. Therefore, midwives can help women with preeclampsia by promoting health behaviors to reduce their stress and increase health-promoting behaviors.

Introduction

Pregnancy has been known as a critical period. With the onset of pregnancy, changes are occurred in woman's body such that she becomes a new person with new physical and mental characteristics that will change her health behaviors and lifestyle.¹

Pregnancy should be considered as a normal physiological and unique state in a woman's life, however, a previous illness or unexpected maternal or fetal disease may result in complications during pregnancy.²

Health Promoting Behaviors are processes to enable people to increase their ability to control over and improve the health.³ Pender in 1996 has classified health promoting behaviors into 6 categories: nutrition, physical activity, stress

management, interpersonal relationships, spiritual growth and health accountability.⁴ During pregnancy, women are often motivated to do health -promoting behaviors to improve the health of both themselves and their fetus.⁵

But the existence of complications in mother's pregnancy may encourage her to begin or improve health promoting behaviors that will enable her to control the difficult situation. On the other hand, having stress may interfere with health-promoting behaviors in a high-risk pregnancy.⁶

Stress is described such that incorporates several concepts. In one concept, it is conceived as events that come from an external upsetting plasticizer, and in the second concept it refers to a reaction resulted

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from a disruption. Finally, realizing an event and assessment of the adequacy of coping with stressful source, describes the hybrid concept of stress.⁷ How do the stressful life events affect the physical and psychological health seriously have yet to be questioned.⁸

Coping with stress influences the three factors of physical, psychological, and social performance. Therefore, if one can successfully cope with everyday stresses, she could help to enhance the improvement of her physical, psychological, and social performance.^{8,9}

Preeclampsia either alone or superimposed to chronic hypertension is the most dangerous case, and a full decade of extensive research could not find the cause yet.¹⁰ Preeclampsia is a pregnancy specific syndrome in which perfusion of organs is reduced due to activation of the endothelium and vascular spasm.¹¹ Mild preeclampsia is defined as systolic blood pressure less than 160 mm Hg and diastolic blood pressure less than 110 mm Hg, and proteinuria of 2+ or less in the urine dipstick test.⁸ Preeclampsia may progress to serious complications and even result in death of mother and her baby.

Maternal and neonatal outcomes in preeclampsia depend on the following: gestational age at the beginning, disease severity, quality of disease management, and presence or absence of pre-existing medical disorders.¹⁰⁻¹³

According to the literature, stress and anxiety can be associated with increased risk of preterm delivery, low birth weight, spontaneous abortion and fetal anomalies.

Prenatal stress is also a known criteria for cerebral and motor development delays in infants, and can be considered as a risk factor for other developmental problems in the neonatal period as well.¹⁴⁻¹⁶ In a study by Stark *et al.*, on pregnant women in US, significant relationship has been found between perceived stress and negative spiritual growth, interpersonal relationships, and stress management.¹⁷ However, according to surveys conducted by the researcher, the relationship between health

promotion lifestyle and the perceived stress in Iran has not been studied. Health promoting behaviors has attracted wide attention in the research as a key factor in health improvement.¹⁸ But there is limited research evidence in this area for pregnant women with disease. The reason is the anticipated result that women with complications may be less likely to develop health promoting behaviors, and experience more stress than women with normal pregnancy. Thus, due to the complications of preeclampsia for mother and baby on the one hand, and the complications of stress on the other hand, this study was carried out to examine the relationship between health promoting lifestyles and perceived stress in women with preeclampsia.

Materials and methods

This was descriptive that conducted on 182 pregnant women with preeclampsia attending in the high risk clinics of Al-Zahra and Taleghani hospitals in Tabriz in 2014.

The method of sampling was convenient. The ethical approval for the study was obtained from Regional Ethics Committee at Tabriz University of Medical Sciences after getting the scientific approval of the research project. All pregnant women with eligible criteria were given a short explanation on the purpose of study, and an informed consent was obtained by keeping their information confidentially. Finally, questionnaires were completed by individual women.

The sample size was based on the standard deviation of sub-domains of health promoting lifestyle that was (0.54) in a recent study¹⁷ were calculated 95 participants by considering an acceptable error of 0.05 around the mean ($m=3.09$), the 95% confidence interval and test power of 0.8.

Sample size for perceived stress based on standard deviation obtained from previous studies (7.31) were calculated 182 by considering acceptable error of 0.05 around the mean ($m=30.23$), that due to the highest

sample size of perceived stress, finally 182 pregnant women with preeclampsia were selected as sample size.

Eligibility criteria for study includes: Iranian nationality, pregnant women with mild preeclampsia (systole pressure lower than 160 mm Hg and diastole pressure lower than 110 mm Hg with proteinuria +2 or lower than +2 in urine test tape) with gestational age of 28-40 weeks, with alive fetus under consideration, under care in Al-Zahra and Taleghani hospitals in Tabriz, not in labor, age of 15-45 years, nonoccurrence of stressful events in the past 2 months, and having tendency to participate in this study.

Tools for data collection in this study includes: 1) demographic questionnaire, 2) Health Promoting Lifestyle-II (HPLP II), and 3) Perceived Stress Scale (PSS) which is provided by Cohen et al. in 1983 with 3 versions of 4, 10, 14 that was applied for measuring perceived stress in past one month. We chose to use version 14 in this study. Each question has 5 options that half of them are direct (0, 1, 2, 3, 4), and the other half are reverse (4, 3, 2, 1, 0) scoring formats.

All items are based on the Likert scale (0 = never, 1 = low, 2 = moderate, 3 = much, 4 = very much) scoring. Scores are ranged between 0-56 sets. It should be noted that 7 questions as positive concepts (4, 5, 6, 7, 9, 10, 13) are reverse (4 = never, 3 = little, 2 = moderate, much = 1, too much = 0).

The standard HPLP II was designed based on Walker et al.,. This questionnaire provides a multi-dimensional assessment of health promoting behaviors in six dimensions, and all items are based on the Likert scale of 1 to 4 (1 = never, 2 = sometimes, 3 = often, 4 = always) scoring with questions about nutrition (9 items), physical activity (8 items), spiritual growth (9 items), health responsibility (9 items), stress management (8 items), and interpersonal relationships (9 items). Validity of the Persian version of this questionnaire has been measured by study of Mohamadi Zeidi et al.,¹⁹ Reliability of the questionnaire was determined by using test-

retest method after conducting a pilot study on 30 pregnant women with mild preeclampsia. Both the reproducibility (ICC=Intra Correlation Coefficient) and internal consistency (Cronbach's alpha coefficient) were determined for perceived stress ICC (confidence interval) was 0.97 (0.94 to 0.98) and Cronbach's alpha coefficient of 0.81, and for health-promoting ICC (confidence interval) was 0.98 (0.97 to 0.99) with Cronbach's alpha coefficient of 0.95.

Data analysis was performed by using SPSS (version 13.0, Chicago, IL, USA). Descriptive statistics including frequency, percentage, mean and standard deviation were used to describe the demographic characteristics, health-promoting behaviors and perceived stress of pregnant women with preeclampsia. The relationship between perceived stress and health-promoting behaviors and its subscales in pregnant women with preeclampsia was determined by using bivariate statistical tests such as Pearson.

Results

More than one third of pregnant women with preeclampsia (40.7%) were in age group of 26-34 years with mean (SD) age of 31.7 (6.2). More than half of the women (63.7%) were in group with gestational age of 28-34 weeks with 33.0 (3.4) weeks. Sex of fetus in less than half of the women (48.9%) was girl.

Most of the women have had their favorite sex of fetus. More than half of the women had diploma degree and 84.1% of them were housewives. About 47.8% of the women's spouses had diploma degree. Most of the women reported their family as "me and my spouse". Most of the women were living in their own home and reported the adequacy of income for life expenses as "to some extent". Most of the women were satisfied with their lives. More than half of the women reported their health situation as "moderate". About half of the women had 2 or 3 pregnancies. Most of the women had less

than 2 children. 7.7%, 21.4%, 5.5% had an experience of still birth, abortion, and labor preterm, respectively. Most women had no history of preeclampsia, and about one third of them had unexpected pregnancies (Table1).

The mean (SD) score of health-promoting lifestyle in women was 2.4 (0.4) of the achievable score ranged from 1 to 4.

According to the results, the highest score for women was in nutrition dimension 2.8 (0.5), and the lowest score was associated with physical activity dimension 1.5 (0.5).

Also their mean (SD) scores were as: for dimension of health responsibility 2.6 (0.5), spiritual growth 2.6 (0.5), stress management 2.4 (0.5), and their interpersonal relationship 2.5 (0.5) was in moderate level. The mean (SD) score for perceived stress was 27.3 (7.1) from the achievable score ranged from 0 to 56 (Table 2). Also, there was a significant reverse relationship between perceived stress and health-promoting lifestyle and its subscales ($P < 0.001$) (Table 3).

Discussion

The total mean score of health promoting behaviors (2.4) in pregnant women with preeclampsia shows that women who perform health promoting behaviors were in the medium level. These findings are similar to the study results of Enjezab *et al.*, and Mirghafourvand *et al.*^{20,21} Among the multiple dimensions of health promoting lifestyle, the highest score for women was in the nutrition dimension (2.8), and the lowest score was for physical activity dimension (1.5). The study by Yadollahy *et al.*, to determine the lifestyle of women during pregnancy showed that the most desirable lifestyle score was related to nutrition, and the poor lifestyle score was related to physical activity.²² Also study by Gharaibeh *et al.*, shows that Jordanian women achieved the average gain in the nutrition but had a

lower score in relation to physical activity and stress management.²³ Differences in results could be due to differences in environmental and cultural issues. On the other hand, lack of physical activity could be due to some limitations of females in our community as well as the duties of women in household related tasks such as marital and motherhood activities. Hence, physical activity and exercise seems to be lower than the other sub-domains of health promoting behaviors. Since it has been proved that physical activity during pregnancy leads to improvement of individual's overall health²⁴, thus the lack of physical activity require policy formulation, regulation of educational and interventional strategies specifically designed to promote physical activity. The adverse results of low physical activity have been discussed in other studies too.^{25,26}

In this study the mean score of perceived stress is demonstrated to be moderate in pregnant women with preeclampsia. The possible cause of stress in pregnant women could start when she gets aware of a complication associated with her pregnancy that needs to be treated. This may cause fear and anxiety in the pregnant mother.

Studies showed that a rapid diagnosis of a medical condition may bring worries in pregnant women about her health and the health of the fetus itself, in terms of financial problems, family coping, and medical treatment. Additionally, some negative emotions such as loneliness, fear, anxiety, untrusting, and depression are associated with high risk pregnancies, and with maternal stresses.^{27,28}

Pregnant women need to do frequent prenatal visits prior to birth, and or have non stress tests twice a week, or they may stay in the hospital or rest at home due to the disease.¹⁰

Therefore, the new condition may interfere with woman's ability to care for other

Table 1. Demographic characteristics of pregnant women with preeclampsia

Characteristics	(n=182) N (%)	Characteristics	(n=182) N (%)
Age		Educational level of husband	
≤ 26	39 (21.4)	Primary school	8 (4.4)
27-34	74 (40.7)	Secondary school	22 (12.1)
≥ 35	69 (37.9)	High school	17 (9.3)
Mean (SD)*	31.7 (6.25)	Diploma	87 (47.8)
Gestational Age (week)		Tertiary	48 (26.4)
28-34	116 (63.7)	Job of husband	
35-40	66 (39.3)	Worker	27 (14.8)
Mean (SD)	33.0 (3.4)	Governmental job	53 (29.1)
Sex of fetus		Shop keeper	38 (20.9)
Girl	89 (48.9)	Self-employed	64 (35.2)
Boy	93 (51.1)	Sufficiency of family income	
Being interested to sex of fetus		Completely	23 (12.6)
Yes	151 (83.0)	To some extent	136 (74.7)
No	17 (9.3)	No sufficient	23 (12.6)
In different	14 (7.7)	Home situation	
Educational level of women		personal	97 (53.3)
Primary school	6 (3.3)	Rent	37 (31.3)
Secondary school	18 (9.9)	Home of woman's family	28 (15.4)
High school	26 (14.3)	Living situation	
Diploma	95 (52.2)	With husband & child	150 (82.4)
Tertiary	37 (20.3)	Woman's family or spouse	32 (17.6)
Job of women		Self-reported health situation	
Housekeeper	153 (84.1)	Excellent	5 (2.7)
Employment outside of the home	29 (15.9)	Good	52 (28.6)
Satisfaction of life		Moderate	104 (57.2)
Yes	165 (90.7)	Poor	21 (11.5)
No	17 (9.3)	History of still birth	14 (7.7)
Average number of pregnancy*	2.22 (1.2)	History of abortion	39 (21.4)
Average number of children*	0.82 (0.9)	History of preterm labor	10 (5.5)
Unwanted pregnancies		History of preeclampsia	65 (35.7)
Yes	65 (35.7)		
No	117 (64.3)		

*Mean (SD), **3 women lived with their family

Table 2. Perceived stress and health-promoting lifestyle and its subscales from the viewpoints of pregnant women with preeclampsia (n=182)

Variable	Mean (SD)
Perceived stress (total)	27.3 (7.1)
Health-promoting lifestyle	2.4 (0.4)
Nutrition	2.8 (0.5)
Physical activity	1.5 (0.5)
Health responsibility	2.6 (0.5)
Stress management	2.4 (0.5)
Interpersonal relationship	2.5 (0.5)
Spiritual growth	2.6 (0.6)

Table 3. The relationship between perceived stress and health-promoting behaviors and its subscales in women pregnant preeclampsia (n=182)

Variable	r	P
Health-promoting lifestyle(total)	-0.8	<0.001
Nutrition	-0.6	<0.001
Physical activity	-0.5	<0.001
Health responsibility	-0.6	<0.001
Stress management	-0.7	<0.001
Interpersonal relationship	-0.7	<0.001
Spiritual growth	-0.8	<0.001

children or do her official responsibilities, and this may become the source of stress and anxiety for her.

The findings show that there was a significant reverse relationship between the perceived stress and health-promoting behavior, and with its all dimensions in pregnant women with preeclampsia. In this study, women with higher stress had less health-promoting behavior, and these findings were consistent with the findings of Starket et al., the relationship between perceived stress and health-promoting behaviors in high risk pregnant women.¹⁸ These findings are also consistent with the results of other several studies.^{29,30}

In this study, women who showed less stress had better nutrition. The results of "Isfahan Healthy Heart Program (IHHP)" data showed that having optimal nutritional conditions such as vegetables, fruits, grains and foods that includes a high level of saturated fat was higher in those with less stress.³¹ Nitta et al., clearly demonstrated the same results in which the

stress level was decreased for those who desired to improve their nutrition particularly through the use of dietary supplements like vitamins and minerals.³²

Pregnant women should always been advised the correct nutrition status as one of the aspects of healthy living is to maximize the health of mothers and minimize the birth complications.³³ Moreover, there was a significant relationship between perceived stress and physical activity observed in this study. Study by Leard Mann et al., showed that by increasing physical activity, the level of stress decreases.³⁴ This could be due to the fact that physical activity and exercise makes the mother feel fresh and lively, and it releases endorphins in the body that is very effective in reducing stress.

In this study significant reverse relationship were observed between perceived stresses and responsibility for health. Possible cause of these findings is responsibility of individuals towards their accepted duties of health and personal hygiene, as well as that be effective in reducing stress.

The relationship between perceived stress and subscale of stress management has also been shown in findings of Stark et al.¹⁷ The reason for this finding could be that the use of stress management techniques such as relaxation, meditation, positive thinking and focus on problem-solving approaches can be effective in reducing stress. The study by Stark et al., has shown that interpersonal relationships could be considered as a fundamental variable to enable coping with stress. This is due to the fact that life skills and communication skills such as active listening, effective dialogue, and empathy and self-expression of needs to family can be effective in reducing stress. In this study, people who experienced better spiritual growth had less stress and these findings are consistent with the study by Stark et al.¹⁷

Spirituality allows people to find a unique meaning in life and believe in superior force. Verses and Hadith also suggest that prayer, reading Quran, praying and having relationship with God comforts the heart and reduces the stress.

Conclusion

The findings showed that there was a reverse relationship between the perceived stress and health-promoting behaviors. Running the support and counseling programs with increased emphasis on health-promoting behaviors seems to be necessary to reduce stress for the purpose of health promotion in these women. One limitation of this study was its cross-sectional nature, and the relationships shown between health promotion behaviors with perceived stress and demographic characteristics which do not indicate that it is a causal relationship. Another limitation of the study was convenience of the sampling that reduces the generalizability of the results. Also since the questionnaires were completed by self-completion method by samples, therefore, individuals may have

no understanding of the questions to give correct answers.

Further studies are recommended to be conducted under the same title in other cities, and the health requirements of people should be compared according to their different cultural and environmental situations. Also, it is recommended to do some quantitative and qualitative research to identify barriers and facilitators of the health promoting lifestyle and stress reduction in women with preeclampsia.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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