

Investigating Women's Lifestyle during the Preconception Period in Kalat County, Iran

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ABSTRACT

Background & aim: Factors such as weight, diet, cigarette smoking and unprescribed drug use, and also environmental pollutants affect maternal health and the birth of the healthy neonates. The aim of this study was to investigate women's lifestyle during the preconception period in Kalat, Iran.

Methods: This descriptive, cross-sectional study was conducted on 118 married women, who did not use any contraceptive methods in order to get pregnant, from August to March 2012, in Kalat County, Iran. The subjects were covered by Kalat medical and health centers and were selected using quota sampling method. The data were collected using a questionnaire including demographic characteristics and preconception lifestyle. The collected data were analyzed using SPSS and Pearson's correlation and ANOVA tests. $P < 0.05$ was considered statistically significant.

Results: The mean age of the subjects was 25.2 ± 6.05 years. The most desirable and undesirable aspects of lifestyle were not using of unprescribed drugs and cigarettes (7.38 ± 0.9) as well as lack of physical activity (3.06 ± 1.1), respectively. There was a significant correlation between women's occupation and drug and cigarette use ($P < 0.049$). In addition, there was a negative correlation between the number of live births and physical activity ($r = -0.291$, $P = 0.001$). More than half of women (53.4%) had no preconception care, and only 33.9% of females who received preconception care had taken folic acid supplements regularly.

Conclusion: Women's lifestyle was not desirable in relation to physical activity, and the majority of women had irregular consumption of folic acid supplements. It is therefore suggested to train women who have decision for pregnancy to do preconception care to take good care of her health before being pregnant.

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Introduction

Pre-pregnancy period is one of the most important stages in a woman's life during reproductive years. Health of women during these years leads to desirable outcomes for both mother and infant, and decreases pregnancy related problems, birth defects, fetal death, low

birth weight, and preterm birth (1). Hence, providing maternal and neonatal health care should be considered a priority in health care services (2).

Promotion of pre-pregnancy health is a prophylactic strategy, which includes the

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improvement of couples' health to facilitate a healthy pregnancy, fertility preservation, and recognition of the risk factors. This strategy includes increasing mothers' knowledge, motivation, skills, and access to health care services. It also encourages the provision of a supportive environment and healthy behaviors before pregnancy, based on pre-pregnancy health guidelines. These guidelines include planning for the reproductive period, cessation of addictive/illegal drug use (including alcohol and cigarettes), physical activity, a healthy diet, consulting physicians about the consumption of prescribed medications, use of multivitamins and folic acid supplements, updating vaccination, controlling diseases such as diabetes mellitus, avoiding contact with harmful environmental toxins, and finding the family history of diseases (3).

A healthy lifestyle depends on several interventions and modifications, encompassing almost all aspects of life. It is related to patterns in daily life such as nutrition and dietary habits, leisure time, smoking, physical activity, stress, and use of health care services (4). A desirable lifestyle contributes to healthy living, while an unhealthy lifestyle has adverse effects on the health of an individual (5). Choosing a lifestyle is based on a series of conscious behaviors, and can have long-lasting effects on mothers and neonates during pre-pregnancy period (6).

Today, obesity, as a contributing risk factor, is linked to many diseases. Previous studies show that obesity in early ages, particularly in children, may predispose individuals to various diseases in the future. According to the results of most recent studies, prevention of childhood obesity begins before the mother's pregnancy. The results showed a significant relationship between maternal pre-pregnancy weight and obesity in children during their first year of life; in fact, obesity in children increases in accordance with maternal overweight. Women who are overweight or obese, gain more weight during pregnancy and maintain it during postpartum period (7).

Pre-pregnancy period is the best time for planning a healthy nutrition and physical activity, and one can begin pregnancy after weight adjustment. Pre-pregnancy body mass index (BMI) less than 19.8 kg/m² indicates

chronic malnutrition, and BMI > 26.1 kg/m² shows an imbalance between energy intake and expenditure. Several studies have shown that low BMI is associated with intrauterine growth restriction (IUGR), preterm delivery, and iron deficiency anemia (8, 9); on the other hand, high BMI is related to infertility (10), gestational diabetes (11), hypertension and preeclampsia induced by pregnancy, (12), birth defects (13), infant macrosomia ($w \geq 4500$ gr) (14), cesarean section, prolonged labor (15), and postpartum anemia (16).

Another aspect of lifestyle, which contributes to the mental and overall health improvement of an individual is physical activity. At least 30 min of moderate physical activity on most weekdays (preferably every day) is recommended for women (3). Exercise routine should be planned six weeks to six months before pregnancy, so that it can be continued during pregnancy period. The purpose of these routines should be determined by consulting a physician before pregnancy; the goal can be weight gain or loss, and infertility treatments (17).

Selection of a suitable diet during reproductive years is another aspect of a healthy lifestyle. Pre-pregnancy period is the best time for women to modify their dietary habits and select healthy nutritional patterns, since most pregnancies are unwanted and women find out about their pregnancies after some weeks of conception.

Most women during their reproductive age do not have sufficient intake of some micronutrients. These micronutrients include vitamins E, B6, C, A, folate, calcium, iron, zinc, and magnesium, which provide the necessary nutrition for the mother, and are essential for fetal growth and continuation of a healthy pregnancy (18).

Stress management is another important aspect of healthy lifestyle (19). Prevalence of anxiety and mood disorders is very high among women during their reproductive years. Evidence shows that sudden presentation of psychosis or recurrence of psychological disorders is very common in pre-pregnancy period (10-20%) (20). Based on the results of previous studies, stress before conception, which is an important step in neonatal growth,

is associated with fetal mortality (21).

Smoking is another aspect of lifestyle, which causes sexual dysfunction in men, delay in pregnancy, and primary and secondary infertility during pre-pregnancy period (17).

Another dimension of lifestyle is related to use of health care programs or seeking healthy behaviors. Pre-pregnancy care is an important element of healthcare and health promotion strategies for women in their reproductive age. In fact, pre-pregnancy care includes screening and medical interventions for women in their reproductive age to reduce risk factors affecting further pregnancies. In other words, pre-pregnancy care is part of an extensive care model, which leads to the health of women, children, and families in general (22, 23).

The United States Center for Disease Control and Prevention held a national conference in March 2005 about pre-pregnancy care, and published national guidelines for pre-pregnancy health and the related care in April 2006 (24). In Iran, in years 1899 to 1992, the Department of Population and Family Health, with regard to maternal health management, released the standards of maternal care services at non-hospital level. Also, a pilot experiment was performed regarding pre-pregnancy counseling in the country, in 1993. Today, after pilot performance and revision by service providers and authorities of family health, this type of care is provided in many district health centers in the country. Also, due to the necessity of folic acid intake 3 months before pregnancy (to prevent neural tube defects), folic acid supplements are prescribed by physicians and midwives for all women who refer for maternal care services (25).

Despite the importance of pre-pregnancy care, very few studies have investigated pre-pregnancy lifestyle. In Iran, the only related study is by Riazi and colleagues, who investigated the use of folic acid supplements during the pre-pregnancy period (26). The number of related studies performed in other countries is also limited. We can only mention the cohort study of women's health in Pennsylvania, U.S., which investigated pregnancy planning and pre-pregnancy healthy behaviors (3).

Pre-pregnancy lifestyle has a direct effect on maternal health and pregnancy outcomes.

However, few studies have been conducted in this field, therefore, this study aimed to determine the lifestyle of women during pre-pregnancy period, and to assess the relationship between lifestyle and some socio-demographic characteristics of subjects, referring to Kalat health care centers, in 2012.

Materials and Methods

This cross-sectional study was conducted in Kalat County during the second half of 2012. The study population included married women in their reproductive years, covered by urban and rural health care centers of Kalat. Using a pilot study (27), the sample size was determined as 118 subjects. The participants were randomly selected using the quota sampling method, based on the coverage percentage of each health center.

The participants who met the following criteria were included in the study: 1) recently-married women, 2) previous history of pregnancy or delivery, 3) non-use or cessation of contraception, 4) willingness to participate in the study, and 5) no psychiatric disorders.

The tools used in this study were designed based on a literature review, which demonstrated the impact of pre-pregnancy interventions with regard to cigarette smoking, physical activity, nutrition, weight adjustment, and folic acid consumption on improving pregnancy outcomes (28). Therefore, a researcher-made tool was provided based on the standard questionnaire of general lifestyle (29), which was revised according to previous literature and pre-pregnancy conditions.

The questionnaire included socio-demographic characteristics, pre-pregnancy health behaviors (pre-pregnancy care, dental care, and use of folic acid supplements), and twenty-three questions regarding the aspects of physical activity, nutrition, smoking, alcohol and drug use, stress management, and safety observation.

In the questionnaire, three questions were related to physical activity, and regarding the aspects of nutrition, smoking, drug consumption, stress, and safety, five questions were designed for each. For scaling the responses, 3-point Likert scale was used, and the options included "almost always", "sometimes", and "never"; a score between zero

to two was allocated to each answer. Obtaining high scores indicated a desirable lifestyle with regard to that aspect; the maximum scores were 6 for nutrition, and 10 for the rest.

After the primary design of the questionnaire, the opinions of obstetricians, specialists in reproductive health, and obstetrics and gynecology were evaluated. The reliability of the questionnaire was calculated via test-retest, with a coefficient of 0.80. The questionnaire was completed via interviews after taking informed consents. The response rate of the sample was 100%.

Data analysis was performed by SPSS v16.5, using frequency distribution, mean, standard deviation, and statistical tests of Pearson correlation, ANOVA and Chi square test.

Results

In this study, the mean of women's age was 25.2 ± 6.05 years. Thirty nine percent of the subjects were nulliparous, and 39%, 16.9%, and 5.1% had one, two, and three children, respectively. The majority of the subjects had a high school education level (33.1%), and the residency location in the majority of cases was urban areas (55.9%).

The majority of women (53.4%) had not attended pre-pregnancy care programs, and only 33.9% of them had regularly used folic acid supplements during the pre-pregnancy period. In addition, the majority of women (83.1%) had not undergone dental care during the pre-pregnancy period.

There was a significant relationship between educational level, using folic acid supplements, and attending pre-pregnancy care ($P < 0.001$ and $P = 0.001$), respectively. In addition, a significant relationship was found between women's residency location, using folic acid supplements, and attending pre-pregnancy care ($P < 0.001$ and $P = 0.04$, respectively). Pre-pregnancy care attendance was more frequently observed among women residing in rural areas; though the consumption of folic acid supplements was higher in urban areas. In total, 10% and 18% of urban and rural women did not consume folic acid supplements, respectively. There was a significant correlation between women's occupation and using folic acid ($P < 0.016$); in fact, employed women used more folic acid.

Statistical analysis revealed that among five aspects of lifestyle, the highest mean was related to non-use of cigarettes and drugs, and the lowest mean was related to physical activity and safety observation. The mean scores of pre-pregnancy lifestyle questionnaire are shown in Table 1.

Table 1. Mean scores of women regarding different aspects of pre-pregnancy lifestyle

Lifestyle aspects	Mean±SD
Cigarette/alcohol/ illegal drug use	9.0 ±3.7
Nutrition	12.1±8.5
Physical activity	16.1±06 .3
Stress management	47.1±2 .6
Safety observation	63.1±4 .4

Table 2. The relationship between different aspects of pre-pregnancy lifestyle and socio-demographic characteristics

Socio-demographic characteristics		Nutritional habits	Physical activity	Smoking/drug use	Safety observation	Stress management
Maternal age	F#	0.594	0.196	0.398	0.487	1.079
	P\$	0.620	0.899	0.755	0.692	0.361
Marriage duration	F	1.394	0.034	0.541	1.316	0.224
	P	0.252	3.472	0.583	0.272	0.799
Mother's education	F	1.734	1.167	1.909	1.987	1.066
	P	0.147	0.329	0.114	0.101	0.377
Mother's occupation	F	0.203	0.899	2.706	0.457	1.376
	P	0.894	0.444	*0.049	0.713	0.254
Spouse's education	F	0.814	0.483	0.802	0.095	1.292
	P	0.519	0.781	0.526	*0.019	0.277
Spouse's occupation	F	0.935	0.720	1.534	1.002	0.782
	P	0.446	0.580	0.197	0.10	0.539
Place of residence	F	.04	0.162	2.91	3.20	0.924
	P	*0.001	0.688	0.091	0.076	0.338

* $P < 0.05$, # Fisher's exact test, \$ P -value

Table 3. Correlation between different aspects of pre-pregnancy lifestyle and socio-demographic characteristics

Socio-demographic characteristics	Nutritional habits	Physical activity	Smoking/drug use	Safety observation	Stress management
Maternal age	-0.026	-0.012	0.000	0.040	0.031
Marriage duration	0.117	0.103	0.048	0.073	0.015
Number of previous pregnancies	-0.036	*-0.187	0.005	0.062	0.109
Interval between two pregnancies	0.052	-0.206	0.021	0.089	0.062
Number of children	-0.107	-0.291	-0.103	0.089	-0.060

$P < 0.05$

The results of ANOVA test showed the relationship between mother's occupation, smoking and drug use, spouse's education and safety observation (Table 2).

The correlation between pre-pregnancy lifestyle and some demographic characteristics is shown in Table 3.

Discussion

The results of this study showed that the most and least desirable aspects of lifestyle were cigarette/drug non-use and physical activity, respectively. Unlike the current study, in a cohort study on women's health in Pennsylvania, most women did not have proper nutrition before, during, and after pregnancy due to financial issues and lack of food accessibility.

In the mentioned study, only 12% of women were physically active at the beginning of the study; even during the two-year follow-up after pregnancy, their physical activity did not improve, similar to the present study (30). Also, in the study of De Weerd et al. (2003), women planning pregnancy did not have desirable nutrition, which may be due to environmental/cultural differences in these study populations (31).

In the present study, cigarette/drug non-use had a higher mean score in comparison with the mentioned study. In the Pennsylvania study, 79% of women had stopped smoking at the beginning of the study, and this behavior had improved during the two-year follow-up. In the study of De Weerd and colleagues, smoking/alcohol use was more prevalent among women planning pregnancy, in comparison with the control group (31); the discrepancies may be due to cultural and time differences in these studies.

Our results showed no significant relationship between mother's education and lifestyle, which is consistent with the findings of

Black et al. (27); however, in the study of Yadollahi, scores of nutrition and physical activity were more favorable for subjects with high levels of education (32). The review study conducted by Delysent et al. showed that variables such as awareness and knowledge did not affect pre-pregnancy health-related behaviors such as physical activity, smoking, alcohol use, and other risk factors (33).

Discrepancies in the results of conducted studies may be due to the effects of issues such as education and economic status on lifestyle. In the present study, smoking/drug use was associated with women's occupation ($P=0.049$). Employed women were more cautious about self-medication during pre-pregnancy period; moreover, the role of interaction and communication with colleagues, regarding self-medication, should not be ignored. In this study, the lifestyle of urban women was more desirable in terms of nutrition, compared to rural women. The observed difference may be due to better economic status of urban women and food availability.

Based on our results, there was a negative correlation between the number of previous pregnancies and physical activity. In the study of Black et al., there was no relationship between the number of previous pregnancies and physical activity during pregnancy; however, in the study of Yadollahi, a significant inverse relationship was observed between the two mentioned variables. In other words, the physical activity level of pregnant women reduced as the number of previous pregnancies increased (32). The discrepancies in the results can be related to differences in physical and physiological conditions of women in two different periods of pregnancy and non-pregnancy.

In the present study, the majority of women (53.4%) did not attend pre-pregnancy care, and

only (33.9%) of them had regular use of folic acid supplements during the pre-pregnancy period. Moreover, in the study of Riazi, although 80% of women had planned pregnancy, only 9% of them had used folic acid supplements during the pre-pregnancy period (26).

In the study of Manin et al. (2013), 55.5% of women had used folic acid during pre-pregnancy period; women's lifestyle and some demographic variables were associated with non-use of folic acids. Although a higher percentage of the subjects had used folic acid supplements in the mentioned study, the authors concluded that using folic acid supplements during pre-pregnancy period had not improved in recent years (34).

In the present study, similar to other conducted research, a significant relationship was observed between the consumption of folic acid supplements during pre-pregnancy period and women's educational level (35, 36). It seems that a higher level of education increases women's knowledge about folic acid, and leads to its appropriate use. In the present study, pre-pregnancy care was mostly observed among women in rural areas, though folic acid use was higher among urban women.

The higher rate of pre-pregnancy care among women in rural areas can be attributed to two factors. One factor is related to the earlier implementation of pre-pregnancy care guidelines in rural areas compared to urban areas; the other factor is related to pre-pregnancy care and follow-ups by health care workers, which are more prevalent in rural areas, in comparison with urban regions. However, despite the active provision of pre-pregnancy care in rural centers, folic acid consumption was lower among rural women, compared to their urban counterparts, which showed that factors such as an attitude, social norms, and cultural affairs could interfere with women's learning.

In addition to the provision of pre-pregnancy care by health care providers, other solutions (e.g. consumption of foods enriched by folic acid) should be considered particularly for women during their pre-pregnancy period.

Based on the results of the present study, folic acid consumption was more frequently observed among employed women, compared

with housewives. In the study of Riazi, a fourfold increase of folic acid use was observed among employed women (26). It seems that these women have more information, and healthy behaviors are more frequently seen among them. This might be due to their higher level of education and social communications, which lead to an increase in their awareness.

Although oral and dental checkups by dentists are considered as pre-pregnancy care, only about 17% of the subjects were referred to dentists during pre-pregnancy period. Attending this type of care is not mandatory during pre-pregnancy period, and the majority are not cognizant of its importance. Consequently, this kind of care is often neglected by women, despite the importance of oral hygiene and dental health during this period.

This study was the first conducted research in the country regarding women's lifestyle during pre-pregnancy period. Lack of resources regarding the studied area is considered as a limitation of this study. Since the questionnaires were self-reports, the subjects may not have included the correct information; however, the researchers tried to reduce this limitation by establishing a good communication with the subjects.

Conclusion

Based on the findings, women's pre-pregnancy lifestyle was not desirable. In addition, health-related behaviors in women, such as regular and proper intake of folic acid and dental referral were not appropriate. Therefore, it is recommended that various programs and activities be carried out in order to create/maintain a healthy lifestyle, by considering the characteristics and culture of a population.

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Conflict of Interest

No conflict of interest exists.

References

1. Centre BSR. Preconception health: Research and strategies. Toronto, Ontario, Canada; 2001.
2. Kelley TM, Stack SA. Thought Recognition, Locus of Control, and Adolescent Well-Being. *Adolescence*. 2000;35(139):531-550.
3. Chuang CH, Weisman CS, Hillemeier MM, Schwarz EB, Camacho FT, Dyer AM. Pregnancy intention and health behaviors: results from the Central Pennsylvania Women's Health Study cohort. *Maternal and Child Health Journal*. 2010;14(4):501-510.
4. Hassanpour Dehkordi A, Shohani M, Salehiyan T, Safdari-Dehcheshmei F, Foruzandeh N, Naderipour A, et al. A comparison of life style with body mass index (BMI) of less and more than 25 in individuals between 20-65 years in Shahrekord city. *Journal of Shahrekord University of Medical Sciences*. 2011;12(4):24-31.
5. Basavanthappa BT. *Community health nursing: Jaypee Bros. Medical P*; 2008.
6. Spear HJ, Kulbok PA. Adolescent health behaviors and related factors: a review. *Public Health Nursing*. 2001;18(2):82-93.
7. Olson C, Strawderman M, Hinton P, Pearson T. Gestational weight gain and postpartum behaviors associated with weight change from early pregnancy to 1  y postpartum. *International Journal of Obesity*. 2003; 27(1): 117-127.
8. Siega-Riz AM, Laraia B. The implications of maternal overweight and obesity on the course of pregnancy and birth outcomes. *Maternal and Child Health Journal*. 2006;10(1):153-156.
9. Kramer MS, Platt R, McNamara H, Usher RH. Are all growth-restricted newborns created equal (ly)? *Pediatrics*. 1999;103(3):599-602.
10. Solomon CG, Willett WC, Carey VJ, Rich-Edwards J, Hunter DJ, Colditz GA, et al. A prospective study of pregravid determinants of gestational diabetes mellitus. *JAMA: The Journal of the American Medical Association*. 1997;278(13):1078-1083.
11. Hendler I, Goldenberg RL, Mercer BM, Iams JD, Meis PJ, Moawad AH, et al. The Preterm Prediction Study: association between maternal body mass index and spontaneous and indicated preterm birth. *American Journal of Obstetrics and Gynecology*. 2005;192(3):882-886.
12. Anderson JL, Waller DK, Canfield MA, Shaw GM, Watkins ML, Werler MM. Maternal obesity, gestational diabetes, and central nervous system birth defects. *Epidemiology*. 2005;16(1):87-92.
13. Larsen CE, Serdula MK, Sullivan KM. Macrosomia: influence of maternal overweight among a low-income population. *American Journal of Obstetrics and Gynecology*. 1990;162(2):490-494.
14. Cnattingius S, Bergström R, Lipworth L, Kramer MS. Prepregnancy weight and the risk of adverse pregnancy outcomes. *New England Journal of Medicine*. 1998;338(3):147-152.
15. Bodnar LM, Siega-Riz AM, Cogswell ME. High prepregnancy BMI increases the risk of postpartum anemia. *Obesity Research*. 2004; 12(6):941-948.
16. Bodnar LM, Siega-Riz AM, Miller WC, Cogswell ME, McDonald T. Who should be screened for postpartum anemia? An evaluation of current recommendations. *American Journal of Epidemiology*. 2002;156(10):903-912.
17. Bayrami R, Latifnejad Roudsari R, Mirzaee Rabor F. *The principles of preconceptional health promotion*. Tabriz: Elvin; 2012.
18. Health living. health canada; 2013 [cited 2013 12/8]; Available from: <http://www.hc-sc.gc.ca/hl-vs/index-eng.php>.
19. Nasiri M. *Mental health and labor* Esfahan. Esfahan: Boshra; 2000.
20. Cohen LS, Nonacs RM, Oldham JM. Mood and anxiety disorders during pregnancy and postpartum: *American Psychiatric Pub*; 2007.
21. Class QA, Khashan AS, Lichtenstein P, Långström N, D'Onofrio BM. Maternal Stress and Infant Mortality The Importance of the Preconception Period. *Psychological Science*. 2013; 24(7): 1309-1316.
22. Allaire AD, Cefalo RC. Preconceptional health care model. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 1998;78(2):163-168.
23. Jack BW, Culpepper L. Preconception care. *JAMA: The Journal of the American Medical Association*. 1990;264(9):1147-1149.
24. Johnson K, Posner SF, Biermann J, Cordero JF, Atrash HK, Parker CS, et al. Recommendations to improve preconception health and health care—United States. *Morbidity and Mortality Weekly Report*. 2006;55(4):1-23.
25. Education MoHaM. Preconception health care. 2012 [cited 12/3/2013]; Available from:

- <http://behdasht.gov.ir/index.aspx?siteid=1&pageid=127&newsview=81815>.
26. Riazi H, Bashirian S, Cheraghi F. Folic Acid Intake during Preconceptional Period. *Scientific Journal Hamedan Nursing & Midwifery Faculty*. 2010;18(2):38-42.
 27. Moshki M, Bahri N, Sadegh Moghadam L. Lifestyle of pregnant women living in Gonabad (Iran). *Journal of Research & Health*. 2012;2(2):200-206.
 28. Temel S, van Voorst SF, Jack BW, Denktas S, Steegers EA. Evidence-Based Preconceptional Lifestyle Interventions. *Epidemiologic reviews*. 2014; 36(1):19-30.
 29. Taylor C, Lillis C, LeMone P. *Fundamental of nursing: The art and science of nursing care*. Dimensions of Critical Care Nursing. 1990; 9(1):28.
 30. Gardiner PM, Nelson L, Shellhaas CS, Dunlop AL, Long R, Andrist S, et al. The clinical content of preconception care: nutrition and dietary supplements. *American Journal of Obstetrics and Gynecology*. 2008;199(6):S345-S356.
 31. de Weerd S, Steegers EA, Heinen MM, van den Eertwegh S, Vehof RM, Steegers-Theunissen RP. Preconception nutritional intake and lifestyle factors: first results of an explorative study. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2003;111(2):167-172.
 32. Yadollahi P, Davazdahemami S, Bromandfar K, Fathizadeh N. The relationship between life style and individual reproductive characteristics of pregnant woman. *Iranian Journal of Nursing and Midwifery Research*. 2008;12(3):75-79.
 33. Delissaint D, McKyer ELJ. A systematic review of factors utilized in preconception health behavior research. *Health Education & Behavior*. 2011; 38(6):603-616.
 34. Manniën J, de Jonge A, Cornel MC, Spelten E, Hutton EK. Factors associated with not using folic acid supplements preconceptionally. *Public Health Nutrition*. 2013;1-7.
 35. Wu DY, Brat G, Milla G, Kim J. Knowledge and use of folic acid for prevention of birth defects amongst Honduran women. *Reproductive Toxicology*. 2007;23(4):600-666.
 36. Bener A, Al Maadid MG, Al-Bast DA, Al-Marri S. Maternal knowledge, attitude and practice on folic acid intake among Arabian Qatari women. *Reproductive Toxicology*. 2006;21(1):21-25.