

# Iranian women's knowledge and attitude regarding preconception health: 12 years after integration into the primary health care network

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## Abstract

**Context:** Despite the emphasis on the preconception care, the majority of people are not aware of how environmental and lifestyle factors influence reproductive and fetal health.

**Aims:** The objective of this study was to determine knowledge and attitude of women in reproductive age about preconception health in the context of free and universal access to preconception health care.

**Setting and Design:** A cross-sectional study in public health centers.

**Materials and Methods:** This study was performed using a convenient sample of 400 women presenting to public health centers in Abhar, Iran. Knowledge and attitude were assessed using researcher-made questionnaire. Questionnaire went through validity and reliability process.

**Statistical Analysis Used:** Data were analyzed using SPSS version 19. The knowledge and attitude scores among subgroups according to demographic characteristics were studied using ANOVA test.

**Results:** Over two third (68.8%) of women had adequate knowledge about preconception care. Sixty nine percent had positive attitude towards preconception care. Education and age were significantly associated with knowledge and attitude.

**Conclusion:** Despite the relatively high level of knowledge, nearly half of the women perceived preconception health optimization as difficult that may lead to not engaging in preconception health behaviors. The younger women and those with fewer years of education should be focus of preconception health program.

**Keywords:** Attitude, Iran, Knowledge, Preconception care, Primary health care

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## INTRODUCTION

Preconception care was defined as providing information and health care to women prior to pregnancy. The aim of preconception care is to identify and modify biomedical, behavioral, and social risks to a woman's health and her future child CDC.<sup>[1]</sup> International health organizations such as the CDC, the American College of Obstetrics and

Gynecology, and the American Academy of Pediatrics have published guidelines for recognition and delivery of preconception care. These guidelines focus on behavioral issues (e.g., drug abuse, nutrition, domestic violence, and physical activity), chronic disease, genetic screening, vaccination, medication, sexually transmitted diseases, and previous adverse pregnancy outcomes.<sup>[2]</sup> Experts of

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CDC believe that the majority of people are not aware of how environmental, health, and lifestyle factors influence reproductive health and childbearing and emphasize that the improvement of preconception health will require changes in knowledge, attitudes, and behaviors of men and women.<sup>[1]</sup>

In the past two decades, major advances have been taken in the provision of essential primary health care in Iran. This leads to better health indicators for Iranian population.<sup>[3,4]</sup> Despite this improvement, poor birth outcomes and low-gradient decrease in trend of neonatal mortality rate continue to be a problem in Iran.<sup>[3]</sup> Considering this fact that that half of all pregnancies are unplanned<sup>[5]</sup> and many women are unaware of their pregnancy during the most critical time for the fetus<sup>[6]</sup> for achieving better pregnancy outcomes, there is a need to meet preconception health needs in a timely manner. In 2002, the bureau of Family Health and Population in Iran Ministry of Health developed program of Integrated Management of Pregnancy and Child birth (IMPAC). In IMPAC program, preconception health care was integrated in Primary Health Care Network of Iran and was considered one of the essential health-care services that midwives should provide in health-care centers in rural and urban areas. According to IMPAC program guideline, all married women in childbearing age who are planning for pregnancy and women without pregnancy plan who do not use any contraception methods should undergo preconception assessment. During the assessment, a midwife completes a form consisting of family history of diseases, reproductive history, infectious disease, chronic medical condition, high-risk behaviors, lifestyle, vaccination, nutrition, and body mass index (BMI). Essential information about preconception health was provided during assessment session. Then, the body systems' examination was done by general medical practitioner and screening and laboratory tests are requested. If necessary, women were referred to specialists as the second level of health care. Results of this evaluation are valid for 1 year.<sup>[7]</sup> Yet, twelve years after universal implementation of preconception health care, it is unclear what do women know and believe regarding preconception health. Our objective was to explore knowledge and attitude of women in reproductive age about preconception health in the context of free and universal access to preconception health care.

## MATERIAL AND METHODS

### Study population and procedure

This cross-sectional study was conducted in Abhar district in northwest of Iran in 2015. All women who referred to

Abhar Health Care Centers for receiving maternal and child health services represent the study population. Considering prevalence of key outcome (preconception knowledge) 50% and at least 80% power at the 5% significance level, we calculated 400 sample size. We calculated the sample size by selecting at least 80% power at the 5% significance level in the prevalence of a range of key outcomes (e.g. folic acid consumption) where the prevalence may vary from low (e.g. 5–10%) to more common (e.g. 50%). Using convenient sampling, a total of 400 married women aged 14-49 years was entered to the study. The sample included pregnant and non-pregnant women. Prior to distributing the survey tool, the objective and purpose of the study were explained to women and informed consent forms were completed. The women were interviewed by trained three university students. The study was approved by the Ethical Committee of the Zanjan University of Medical sciences with funding number of 113793.

### Questionnaire

The survey tool included closed- ended questions about demographic characteristics (age, level of education, occupation), reproductive history (gravidity, parity, unwanted pregnancy, pregnancy intention), knowledge and attitudes about preconception care. The knowledge section consisted of 9 multiple choice questions. In this section we told the participants that they to suppose they were planning to get pregnant in nearing next months and asked them about the best time for counseling, assessing and managing of ten conditions that were listed in 9 knowledge items including: HIV/AIDS and hepatitis B, dental and periodontal diseases, hereditary and genetic diseases, sexually transmitted infections, nutritional status, BMI (Body Mass Index), drug use, folic acid consumption, rubella vaccination. Answers choices for these 9 items were: A) Right now, prior you become pregnant B) As soon as you discover you are pregnant C) After you've been pregnant for at least 4 months D) There is no need for evaluation of this item E) I am not sure about this item. Answers were scored as correct (1) or incorrect (0). Possible knowledge scores range from 0 to 9. Attitude was measured using 5 statements. First four statements had negative content and the last one had positive content. Responses to statements of preconception care were measured on a five-point Likert scale, ranging from very agree (score 1) to agree (2), no comment (3), disagree (4) and very disagree (5). The scores were reversed for positive statement. Possible scores range from 5 to 25. A cut off level of < 16 was considered as negative attitude and ≥16 was considered as positive attitude towards preconception care.

The questionnaire developed and adopted based on existing literature about preconception health and experts' opinion. We used item impact score for determining face validity. Feedback from 20 individuals of target group were used for calculating item impact score. Items with impact score lower than 1.5 were removed. The content validity of questionnaire was tested using CVR (Content Validity Ratio) and CVI (Content Validity Index). CVR and CVI was calculated based on the feedback from multidisciplinary panel of 10 experts in related fields including obstetrics and gynecology, epidemiology, health education and promotion, maternal and child health, nursing and midwifery. Items with CVR lower than 0.62 and CVI lower than 0.79 were removed. After identifying items, the questionnaire was pilot tested with 15 women and the results of the pilot testing were used to revise the questionnaire for unclear wording or ambiguity. The internal consistency of the instrument was examined using Cronbach's alpha. Cronbach's alpha coefficients for the knowledge and attitude sections were 0.79 and 0.71 respectively.

### Statistical analysis

Analyses were performed using SPSS version 19 (SPSS Inc., Chicago, IL, USA) for Windows. Descriptive statistics for demographic and reproductive items were expressed as *n* (%). The knowledge and attitude scores were tested for normality of distribution using one-sample Kolmogorov–Smirnov test. The samples showed a normal distribution. ANOVA test was used for comparison of knowledge and attitude means between different subgroups of respondents. We used Bonferroni *post hoc* test for pair-wise comparison of knowledge and attitude means between different subgroups.  $P < 0.05$  was considered statistically significant.

### RESULTS

The vast majority of the studied women (89.6%) were in the age group of 20–39 years, with a mean age of  $27.53 \pm 5.86$  years, ranging from 14 to 47 years. Nearly 56% of the women had high school level of education and 86.8% were homemakers. About 73% of women had 1–2 pregnancy and 20.5% had no experience of pregnancy. With regard to pregnancy plan, 17% were pregnant in the study period, 36% never wanted to become pregnant in the future, approximately 27% considering a pregnancy in either the next months or years, and about 20% had no plan for pregnancy. Of the women who had previously been pregnant, nearly 18% had unplanned pregnancy [Table 1].

**Table 1: Demographic and reproductive characteristics of the studied population**

Characteristics	<i>n</i> (%)
Age (years)	
14-19	26 (6.5)
20-29	243 (60.7)
30-39	115 (28.8)
40-49	16 (4)
Education	
Primary	19 (4.7)
Secondary	86 (21.5)
High school	224 (56)
University	71 (17.8)
Occupation	
Homemaker	347 (86.8)
Employed	53 (13.2)
Gravidity	
0	82 (20.5)
1-2	291 (72.7)
3 or more	27 (6.8)
Pregnancy plan	
Pregnant now	68 (17)
No plan	82 (20.5)
Trying now, want to be pregnant in the next months	16 (4)
Want to be pregnant in the next 1-3 years	90 (22.5)
Never want to be pregnant	144 (36)
If ever pregnant, number with unplanned pregnancy	
0	262 (82.5)
1 or more	56 (17.5)
If ever pregnant, referring center for prenatal care	
Obstetrics and gynecologist office	153 (48.1)
General practitioner office	9 (2.8)
Midwife in private sector	24 (7.5)
Midwife in public sector	129 (40.8)
No prenatal care	3 (0.8)

Table 2 describes the current status of knowledge among women according to their demographic and reproductive characteristics. There were significant differences in knowledge score between different age groups. Bonferroni *post hoc* test showed that mean knowledge score in age groups of 30–39 and 40–49 years was significantly higher than that in the age group of 20–29 years ( $P = 0.019$  and  $P = 0.042$ , respectively). With regard to education, there were significant differences in knowledge score between women. Bonferroni *post hoc* test revealed that mean knowledge score in women with university education was higher than that of secondary and high school education ( $P = 0.007$  and  $P = 0.001$ , respectively). Employed women had significantly greater knowledge compared to homemakers ( $P = 0.001$ ). The total knowledge score was calculated by adding the score of all items. Individual knowledge score ranged from 0 to 9. A cutoff level of  $<6$  was considered as poor knowledge and  $\geq 6$  was considered as adequate knowledge about preconception care. According to this rating, it was found that 31.2% were within the poor knowledge range and 68.8% had adequate knowledge about preconception care. Poor knowledge was apparent in responses to questions relating to best time for assessing and managing of hereditary and genetic diseases,

**Table 2: Mean knowledge scores among the studied women according to the demographic and reproductive characteristics**

Characteristics	Mean±SD	P
Age (years)		
14-19	6.73±1.53	0.003
20-29	6.14±1.99	
30-39	6.79±1.91	
40-49	7.44±1.89	
Education		
Primary	6.31±2.26	0.001
Secondary	6.22±1.93	
High school	6.24±1.96	
University	7.24±1.74	
Occupation		
Homemaker	6.29±1.94	0.001
Employed	7.23±1.92	
Gravidity		
0	6.73±1.89	0.061
1-2	6.27±1.99	
3 or more	7.03±1.74	
Pregnancy plan		
Pregnant now	6.44±1.83	0.085
No plan	6.06±2.02	
Trying now, want to be pregnant in the next months	7.12±1.82	
Want to be pregnant in the next 1-3 years	6.20±2.02	
Never want to be pregnant	6.66±1.94	
If ever pregnant, number with unplanned pregnancy		
0	6.38±1.97	0.472
1 or more	6.57±1.95	
If ever pregnant, referring center for prenatal care		
Obstetrics and gynecologist office	6.67±1.76	0.019
General practitioner office	7.36±1.85	
Midwife in private sector	5.73±2.01	
Midwife in public sector	6.21±2.11	
No prenatal care	4.33±2.88	

SD: Standard deviation

nutritional status, BMI, folic acid consumption, and rubella vaccination. Correct response rates to these questions were 68.5%, 43.8%, 67.1%, 60.2%, and 56.5%, respectively. The mean knowledge score for the entire studied women was  $6.42 \pm 1.96$ .

Table 3 shows the current status of attitude among women according to their demographic and reproductive characteristics. There were significant differences in attitude score between different age groups. Bonferroni *post hoc* test revealed that mean attitude score in the age group of 30–39 years was significantly higher than that in the age group of 20–29 and 14–19 years ( $P = 0.009$  and  $P = 0.004$ , respectively). With regard to education, there were significant differences in attitude score between women. Bonferroni *post hoc* test showed that mean attitude score in women with university education was higher than those with secondary and high school education ( $P < 0.001$  and  $P < 0.001$ , respectively). The total attitude score was calculated by adding the score of all items. Individual attitude score ranged from 5 to 25. A cutoff level of  $<16$  was considered as negative attitude and  $\geq 16$  was considered as positive attitude toward preconception care. According to this rating, 69.2% had

**Table 3: Mean attitude scores among studied women according to the demographic and reproductive characteristics**

Characteristics	Mean±SD	P
Age (years)		
14-19	17.27±3.35	<0.001
20-29	18.00±3.02	
30-39	18.70±2.74	
40-49	19.19±2.05	
Education		
Primary	18.42±2.71	<0.001
Secondary	17.59±3.18	
High school	18.11±2.99	
University	19.19±2.31	
Occupation		
Homemaker	18.15±3.01	0.204
Employed	18.52±2.82	
Gravidity		
0	18.35±2.93	0.127
1-2	18.10±3.02	
3 or more	18.85±2.58	
Pregnancy plan		
Pregnant now	18.06±3.23	0.056
No plan	18.12±2.87	
Trying now, want to be pregnant in the next months	19.23±2.39	
Want to be pregnant in the next 1-3 years	17.72±3.09	
Never want to be pregnant	18.94±2.85	
If ever pregnant, number with unplanned pregnancy		
0	18.16±2.99	0.403
1 or more	18.38±2.91	
If ever pregnant, referring center for prenatal care		
Obstetrics and gynecologist office	18.29±2.92	0.650
General practitioner office	18.91±2.37	
Midwife in private sector	18.20±3.18	
Midwife in public sector	18.06±3.06	
No prenatal care	18.33±1.57	

SD: Standard deviation

positive attitude and 30.8% had negative attitude toward preconception care. For analysis of attitude data as a categorical variable, a response of “agree” or “strongly agree” was considered as agreement and a response of “disagree” or “strongly disagree” was considered as disagreement. Two hundred and thirty-five (58.8%) women had agreement on improvement of health before becoming pregnant. Two hundred and twenty-five (56.2%) disagreed with the following statement: “There is no need for health assessment prior to becoming pregnant.” Two hundred and seventeen (54.2%) women believed that getting pregnant was not an accidental event and they could plan for becoming pregnant. The majority of the study respondents (71%) believed that the development of fetal anomalies was not out of their control and could be prevented. One hundred and four (43.5%) women stated that optimizing of health before becoming pregnant is difficult. The mean attitude score for the entire studied women was  $18.21 \pm 2.98$ .

Spearman’s rank correlation showed significant positive linear correlations between knowledge and attitude ( $r = 0.399$ ,  $P < 0.001$ ).

## DISCUSSION

This study assessed the knowledge and attitude toward preconception health among women who had free and universal access to preconception health care. The results of the current study revealed that, although all the women had access to preconception health care, they had not adequate knowledge about preconception health. Levels of knowledge were high compared to that of studies in developing regions<sup>[8-10]</sup> but, lower than those in the developed countries.<sup>[11-14]</sup> We could not find any study about preconception knowledge before and after implementation of IMPAC program in Iran, so we could not compare these findings with that of other studies in Iran. However, these findings confirmed that women do have high awareness of preconception health. The studied women showed a high awareness about assessing and managing of chronic medical condition, dental and periodontal diseases, sexually transmitted infections, HIV/AIDS, and hepatitis B before getting pregnant, but were less aware about the significance of assessing and managing hereditary and genetic diseases, nutritional status, BMI, folic acid consumption, and rubella vaccination before getting pregnant. Indeed, higher knowledge was in the domain of the influence of disease prevention than certain lifestyle behavior on pregnancy and birth outcomes. Women may not be aware of the early onset of organogenesis and the increased risks of unhealthy behavior in the 1<sup>st</sup> weeks of pregnancy and decide to optimize unhealthy condition during pregnancy period rather than before pregnancy. Furthermore, they may not be aware of the wide range of preconception health issues and behaviors that affect fetal health. These findings indicate the need to continue efforts at increasing awareness of all modifiable risks to fetal health. Any contact with a woman in the childbearing age including family planning consultation and childhood immunization must be considered as an opportunity for preconception health education.

The results of this study demonstrate that over half of the study participants understood the importance of health assessment and improvement of health before becoming pregnant. Furthermore, over half of the women did not consider getting pregnant as an accidental event, but rather a decision made by family. A majority of women perceived control over their ability to prevent fetal anomalies. This improvement in women's view regarding preconception health may be due to the changing maternal health care in Iran, now women obtaining more education and preconception care in IMPAC program. While higher perceived benefits of preconception care may result in increased intent for receiving preconception care, it is

not clear whether it results in behavioral change, such as folic acid consumption, diabetes control, eating healthy diet, and weight loss. Nearly half of the women perceived preconception health optimization as difficult, which could be one reason for not engaging in these behaviors. Although health behavior literature stated a positive association between attitude and behavior, it does not always come true. Regardless of positive attitude toward preconception health, women may hesitate to seek preconception care.<sup>[15]</sup> Some studies indicated that educational background and socioeconomic status influence health behavior.<sup>[16-19]</sup> In a study about consumers' perceptions of preconception health, women felt that living a healthy lifestyle was expensive because of the perceived high cost of healthy food and the cost of obtaining screening tests.<sup>[20]</sup>

Analyzing data on the basis of education level and age group showed that women who had a university degree and higher age group were more aware about preconception health and had positive attitude toward it. Many studies found that preconception health awareness decreased with younger age and lower education,<sup>[6,21-23]</sup> and older age and higher education were related to better preconception attitude.<sup>[15,24]</sup> Education can provide individuals with better access to information and improved critical thinking skills and also it results in greater resources, including access to health care.<sup>[19]</sup> The finding with respect to age may reflect the effect of prior pregnancies and information given during prenatal cares on women's knowledge and attitude.

One limitation of this study is that the women were recruited from only one district; therefore, the results may not be generalizable to other cities or provinces. The second limitation is that the sample represents women who seek free maternal and child health services in public health centers and therefore is not representative of all women.

## CONCLUSION

The present study has revealed that integrating preconception health care to primary health-care network in Iran improved Iranian women's awareness and attitude toward preconception health, but there is a long way ahead. Women are not fully aware of all preconception health issues and lifestyle factors that affect fetal health. Nearly half of the women perceived preconception health optimization as difficult that may lead to not engaging in preconception health behaviors. The younger women and those with fewer years of education should be the focus of preconception health program.

### Conflicts of interest

There are no conflicts of interest.

### Authors' contributions

All authors contributed equally to the writing of the scientific proposal, data collection, and manuscript drafting. The final manuscript was reviewed and approved by all the authors.

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