



## Preconception care patterns and some related factors in pregnant women in Gorgan in 2017

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### Abstract

**Background:** Preconception care is an opportunity to change unhealthy behaviors which in turn reduces unplanned pregnancy and plays an important role in reducing maternal and infant mortality. The aim of this study was to determine the level of preconception care and its related factors in pregnant women.

**Methods:** This cross-sectional study was conducted on 394 pregnant women referred to Gorgan health centers in 2017. Samples were selected by multi-stage stratified sampling method from Gorgan health centers in Golestan province. Data was gathered using self-report questionnaire. Data analysis was performed using chi-square test, Fisher's exact, and Kruskal-Wallis tests in SPSS-16. The P-value less than 0.05 were considered significant.

**Results:** 32.7% of women were received complete preconception care and 17.8% had no pre-pregnancy care. Only 44.2% of women used folic acid daily since the first trimester of pregnancy. Most of pregnant women (63.7%) performed triple screening laboratory test (FBS, CBC, TSH). Preconception care was more successful in mothers with higher level of education ( $P < 0.001$ ), having health insurance ( $P < 0.001$ ), history of disease ( $P = 0.027$ ), higher family income ( $P = 0.044$ ), and nulliparity ( $P = 0.049$ ).

**Conclusions:** Preconception care coverage and acid folic consumption is not optimal. It seems necessary to plan more precisely on how such services need to be provided. The identification of factors associated with this care showed that far less attention was paid among low-income, without assurance coverage and low-educated people. Since these people do not have enough money to take care of mother and infant during pregnancy, health policymakers should provide the related services for free.

**Keywords:** Preconception Care, Pregnant Woman, Reproductive Health

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## Introduction

The main component of preconception care included a comprehensive history (1), however detecting and assessing risks require the promotion of health education and medical and psychological interventions via counseling. This care is applicable to avoid preventable diseases by vaccine, cardiovascular diseases, diabetes and other chronic diseases (2). Therefore, the preconception care with control of underlying diseases such as obesity and diabetes can help improve the outcome of pregnancy (3). According to studies, there are significant relationships between preconception care and preterm labor, premature infant, and fetal distress (4).

The preconception care aims to identify and manage behaviors and conditions that improve the health of mothers and infants (2, 5), promote the women health at the reproductive age before fertilization (2, 5), improve neonatal growth (6) and pregnancy outcomes (2, 3, 5), and reduce maternal and neonatal mortality and complications (6). Benefits of preconception care include providing information for women and their families, giving them the opportunity to change unhealthy behaviors as well as increasing fertility choices and reducing unplanned and unwanted pregnancies (7).

The range of this care varies from one country to another. It was 32.6% in the United States (8) and 83.5% in Italy (9) in 2014. On the other hand, the levels of this care are different regarding different cities in Iran. For instance, the preconception care was 46.6% in Mashhad in 2016 (10) while 47.7% in Isfahan in 2017 (11). According to the Ministry of Health, the preconception care rate was 48.6% in the urban and rural population while 36.5% in the urban population of Iran in 2015. In Golestan province, the preconception care rate was 63.9% in the urban and rural population in 2016 which was greater than the national average, however, it was 31% in the urban population which was less than urban rate in Iran. Given that the aim of this program was to increase the coverage of preconception care to at least 50% in Golestan province by 2021 (12), we should get aware of the factors associated with this care pattern in order to take step towards the improvement of preconception care. Various studies have reported barriers to this care, lack of financial resources (13), costs of preconception care (14), lack of financial coverage of the health sector (2), and women not covered by insurance, especially during the pre-pregnancy (15).

We know that optimizing prenatal health and knowledge about high-risk populations can reduce high level of maternal and childhood mortality and morbidity in marginalized populations and low-income families (6). Therefore, planning with regard to important factors involved in preconception care can be crucial in promoting the program to achieve the goal of 2021. The aim of this study was to determine the preconception care status and some related factors in pregnant women under the coverage of Gorgan health centers.

## Methods

This cross-sectional study was conducted on 394 pregnant women in Gorgan in 2017. The sample was recruited from health centers who was referred to these centers for receiving the prenatal care. The sample size formula for limited population was used according to the total number of pregnant women in Gorgan in February 2016 (n=1921). In the formula, p=0.5 and the maximum sample size was calculated. According to the significance level of 0.05 and the precision of 0.01%, the sample size was estimated 394.

$$n = \frac{Nz^2 p(1-p)}{Nd^2 + z^2 p(1-p)}$$

All pregnant nulliparous and multiparous mothers, who participated in the present study, were selected by random sampling with an appropriate allocation from health centers and resorts (6 health centers and 16 health resorts). At first, six headquarters were considered as classes, and then, the sample quota was calculated from each center according to the covered population by each of the six headquarters. The total number of samples (n=394) was divided by the total covered population of centers and multiplied by the number of covered population by each health center to measure the quota of each center. The inclusion criteria of study were as follows: living in Gorgan until the end of pregnancy; and possession of documents for preconception care. The exclusion criteria included unwanted pregnancy, and unwillingness to cooperate and incomplete questionnaires. Since the whole necessary data in the questionnaire was not available on Nab system, the researcher called qualified pregnant mothers to visit them for completion of questionnaires and checking preconception care documents. Data were collected from health centers and resorts in the morning.

Data was gathered using questionnaire that comprises 11 questions about demographic characteristics (age, education level, occupation, number of pregnancies, ethnicity, spouse's occupation, medical insurance, and medical diseases) and 3 questions about doing exercise, dental visit and pap smear test, three month before pregnancy. In the present study, the preconception care behavior was applied for three measures, filling the registration form before the pregnancy, correct use of folic acid (one daily) and triple blood screening tests (FBS, CBC, and TSH) at least three months before pregnancy. The participants were divided into three groups, complete, incomplete and without prenatal behavior. If a mother had performed all the three behaviors before the pregnancy, she would be considered complete; if she did only one of the three behaviors, she would be considered incomplete, and if none of the above behaviors were applied, she lacked the prenatal behavior. According to the national protocol, this care refers to the interval of 0 to 12 months between prenatal to pregnancy.

Data was analyzed using Chi-square, Fisher's exact test and one way ANOVA or Kruskal-Wallis test in SPSS for Windows version 16.00 (SPSS Inc., Illinois, USA). The significance level of tests was less than 0.05.

The research was initiated after approval of the research project at the deputy of Research and Technology of Golestan University of Medical Sciences. The researcher explained the research objectives to participants, and they were assured that the questionnaires remained anonymous and completely confidential and written informed consent was obtained from all pregnant mothers.

## Results

According to the results, 32.7% of women underwent complete preconception care, 49.5% underwent incomplete care, and 17.8% did not undergo any preconception care. Also the finding indicated that 15.9% of participants received the preconception care from midwives, and 64.5% of them received this care from obstetricians.

The finding showed that the mean age of women who participated in the study was  $28.47 \pm 5.37$ ; and majority of them (87.1%) were housewives, holding an Associate of Science degree (43.9%) and Fars ethnic group (79.9%). 54.1% of participants had middle income and 4.6% had no insurance. There was a statistically significant relationship between education levels of wife and husband, husband's job, insurance, family income and female disease and the level of preconception care, but there was no significant relationship between level of preconception care and the pregnant women's job and the ethnicity. (Table 1)

**Table 1. The relationship between demographic information and Preconception care**

Variables		Complete care	Incomplete Care	No care	Total	P-value
		N (%)	N (%)	N (%)	N (%)	
Education	Elementary or Guidance	14(10.9)	30(15.4)	22(31.4)	66(16.8)	<0.001 *
	High School, Diploma	46(35.7)	76(39)	33(47.1)	155(39.3)	
	Associate Degree, Bachelor	56(43.4)	76(39)	13(18.6)	145(36.8)	
	Ms or Higher	13(10)	13(6.6)	2(2.9)	28(7.1)	
Occupation	Housewife	107(82.9)	170(87.2)	66(94.3)	343(87.1)	0.059 **
	Government employee	12(9.3)	11(5.6)	4(5.7)	27(6.9)	
	Else	10(7.8)	14(7.2)	0(0)	24(6)	
Spouse's Education	Elementary or Guidance	23(17.8)	37(19)	21(30)	81(20.6)	0.004 *
	High School, Diploma	34(26.4)	72(36.9)	31(42.2)	137(34.7)	
	Associate Degree, Bachelor	53(41.1)	65(33.3)	16(22.9)	134(34)	
	Ms or, Higher	19(14.7)	21(10.8)	2(2.9)	42(10.7)	
Spouse's occupation	employee	50(38.8)	55(28.2)	12(17.1)	117(29.7)	0.011

<b>Occupation</b>	<b>Worker</b>	14(10.9)	18(9.2)	13(18.6)	45(11.4)	*
	<b>Self employed</b>	58(45)	113(57.9)	44(62.9)	215(54.6)	
	<b>Else</b>	7(5.3)	9(4.7)	1(1.4)	17(4.3)	
<b>Family Income</b>	<b>Low</b>	45(34.9)	85(43.6)	40(57.1)	170(43.1)	0.044 **
	<b>Moderate</b>	79(61.2)	105(53.8)	29(41.4)	213(54.1)	
	<b>High</b>	5(3.9)	5(2.6)	1(1.5)	11(2.8)	
<b>Medical history</b>	<b>Yes</b>	32(24.8)	53(27.2)	8(11.4)	93(23.6)	0.027 *
	<b>No</b>	97(75.2)	142(72.8)	62(88.6)	301(76.4)	

Fisher test\*\* \*chi-square test

Kruskal-Wallis test indicated that the mean age of pregnant mothers did not differ significantly among three groups. Using this test, the mean time of performing this care until the pregnancy was significantly different in three groups meaning that the mean time was nearly 6 months in complete care, approximately 4 months in incomplete care, and less than a month without care. (Table 2)

**Table 2. Comparison of Mean score of Variables in three level of Preconception Care in Women**

<b>Variables</b>	<b>Complete Care</b>	<b>Incomplete Care</b>	<b>No care</b>	<b>Total</b>	<b>P-value</b>
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	
<b>Women age</b>	5.36±28.71	5.16±28.81	5.81±27.11	5.37±28.47	0.12*
<b>The age of Spouse</b>	4.86±32.38	5.51±32.94	5.55±32.05	5.31±32.60	0.63*
<b>The time of care</b>	3.29±5.85	3.45±4.28	1.52±0.51	3.62±4.12	<0.001*

\* Kruskal-Wallis test

On the other hand, there was a significant relationship between preconception care and medical history; and those, who did not have any child, videlicet, had not yet given birth, had undergone more preconception care than other mothers. (Table 3)

**Table 3. Comparison of stress level between intervention and control groups before and after intervention**

Variables		Complete Care	Incomplete Care	No Care	Total	p-value
		N (%)	N (%)	N (%)	N (%)	
Number of delivery	0	47(57.4)	89(45.6)	29(41.4)	192(48.7)	0.049 *
	1	43(33.3)	79(40.6)	36(51.4)	158(40.1)	
	≥2	12(9.3)	27(13.8)	5(7.2)	44(11.2)	
Number of children	0	75(58.2)	90(46.2)	29(41.4)	194(48.2)	0.037 *
	1	43(33.3)	81(41.5)	37(52.9)	161(40.9)	
	≥2	11(8.5)	24(12.3)	4(5.7)	39(9.9)	

\* Chi-square test

In dental examinations, 33.8% of mothers had got dental visits before pregnancy; and there was a significant relationship between family income and dental care ( $p < 0.122$ ); that is 64.7% of women with middle to high family income level and 35.3% of low-income women had undergone dental care before pregnancy. However, Pap smear screening indicated that only one quarter of mothers underwent the prenatal Pap smear and it had no significant relationship with other demographic variables.

In terms of three important prenatal behaviors (registration, folic acid consumption and triple screening tests), the results illustrated that 66% ( $n=260$ ) were registered for the preconception care and 62.9% ( $n=248$ ) of women underwent the triple blood test (FBS, CBC, TSH), but only 44.2% ( $n=174$ ) of women had taken folic acid daily since the last three months of pregnancy.

Meanwhile, the exercise was associated with preconception care, and 28.7% of those, who completed their preconception care, exercised regularly during pregnancy ( $P < 0.012$ ).

## Discussion

In the present study, 32.7% of preconception care did complete and the percentage was almost in accordance with Iran in 2016 (12) and a study by Oza Frank (2014) in America (32.6%) (8). However, Pandulffi (2014) reported a rate of 83.5% for preconception care in Italy (9) which was more than the present study probably due to a free health system for doing this care in Italy. Shadab et al. (2017) reported the preconception care rate of 47.7% in Isfahan (11), which was very similar to a research by Bayrami et al. (2014) in Mashhad (46.6%) (10,16). Notwithstanding, Roudsari et al. (2016) reported this rate equal to 77.7% in Mashhad (17)

probably due to the improvement in preconception care following a plan to promote this care in Mashhad or due to the cultural and socio-economic differences between the research population as well as the importance of personnel's attention to this care.

In the present study, there was a significant relationship between couples' education and the preconception care which was observed in numerous studies (10, 11, 18-20). The relationship between preconception care and education was expected since people with higher education levels often make more income and the family income is an important factor associated with the preconception care. In this regard, there was a relationship between family income and preconception care in the present study; the relationship has been reported in various studies (11, 19, 21). Therefore, women with more family income took part more in preconception care programs, it is because the tests and sometimes ultrasound and also Pap smear are necessary to get this care, and they are costly. In a study by Roudsari et al. (2016) in Mashhad, there was not any relationship between education levels and income with preconception care, since most of participants received the preconception care from health centers in Mashhad, and thus family income and education level played insignificant roles in this regard. Contrastingly, most mothers had received such services from private centers in the present study, and thus income and education levels were influential in this regard. Existing a significant statistical relationship among husband's job and preconception care and the family income indicates that women, who had more family income, were more likely to participate in preconception care programs. In Shadab study (11), there was not any significant relationship between women's employment and preconception care, however, there was a significant relationship between women's employment and preconception care in other studies, (17, 18) probably due to time constraint of employed women to refer to a health center or physician office.

Results of the present study indicated that there was a significant relationship between insurance and preconception care. This relationship was also observed in the studies of Hawks and Conner (20, 22). They believed that the continuing access to health insurance in prenatal period was important for promotion of mother and neonatal health (15). On the other hand, this care can be provided if it is affordable, since preconception care costs are much lower than costs of treating diseases (23). Policies, which reduce insurance coverage, damage the individual health, especially those with low income and chronic illnesses (24). Voorst et al. (2017) reported that preconception care costs played very important roles in performing care (25).

Results of the present study indicated a significant relationship between preconception care and nulliparity. The finding was consistent with Hawks and Poels et al. (20, 26) and it might be due to a greater awareness and time or the importance of the first pregnancy for individuals.

In the present study, there was no significant relationship between the ethnicity and preconception care, however, there was a significant relationship between ethnicity/ race and preconception care in the studies by Hawks and Conner (20, 22) probably due to the differences in cultural and socioeconomic levels of samples in two different populations and the way of access to care. Nonetheless, since most ethnic groups live in small cities and villages around

Gorgan and the study was conducted on the urban population of Gorgan, it was impossible to study the relationship between this care and ethnicity.

Furthermore, there was no relationship between female age and preconception care in this study; as well as Roudsari et al. study (17) but, there was a relationship between maternal age and preconception care in other studies (18-20, 26) probably due to other intervening variables such as level of literacy and socioeconomic variables.

The results of the present study indicated that 44.2% of women consumed a tablet of folic acid daily since three months before pregnancy. The results were consistent with a research by Bayrami et al. (2014) who reported a rate of 33.9%. (10). However, Mashayekhi (2011) reported the consumption of folic acid equal to 25% in Tabriz (27), and Riyazi et al. (2012) reported the consumption rate of 9% (28), and their results were inconsistent with the above findings probably due to the lack of interest in this issue in the past years, however, there was a study which reported the folic acid consumption of 76% (29). This difference may be due to the level of awareness and the way of women's access to preconception care services in different regions of world.

In the present study, 248 women (62.9%) simultaneously underwent pre-pregnancy tests (FBS, CBC, and TSH). In a study by Roudsari et al., 33.3% of participants underwent the above tests (17). In a study by Ding et al., 39.7% of women underwent these blood tests (19) probably due to the different socio-cultural levels of samples in two populations. In the present study, 133 (33.8%) underwent dental examinations before pregnancy. 33% of women in a resraeach by Roudsari (17), 17% by Bayrami et al., (10) and 51.3% by Robbins underwent prenatal dental care (30). It should be noted that the dental examination during pregnancy is free in health centers and the related services are cost-effective, however, there is no facility before pregnancy and this may be the main reason for lack of oral and dental care during preconception period.

The results of the present study indicated that 100 women (25.4%) had regular prenatal exercise and that there was a significant relationship between preconception care and exercise. The finding was consistent with the results of studies by Roudsari et al. who found that only 7% of women did exercise in their study (17) which was less than the present study. Notwithstanding, Ding found that 56.8% of women exercised before pregnancy (19), and it was more than two times higher than the present study. According to the importance of exercise in the pregnancy health, it is better to pay more attention to this issue.

The results of the present study portrayed a statistical significant relationship between the female medical complication and preconception care indicating that women with diseases were more likely to receive the preconception care. It revealed that self-care rates were higher in patients than in healthy ones. The results were consistent with the results of two other studies by Shadab and Cornner (11, 22).

According to the present study, only 63 (15.9%) out of 394 pregnant women received the preconception care from midwives. In a study by Goossens et al., only 5.8% of participants received information about the preconception care from midwives (29), this indicated the insignificant role of midwives in preconception care probably due to inadequate follow-up and



low motivation of the healthcare personnel for providing this care in health centers. Most importantly, the preconception care requires demanding tests, which despite being within midwives' tasks, mothers often prefer to undergo tests at the lowest cost after their physician's prescription for the tests due to the lack of contract between insurance companies and midwives.

## Conclusion

The complete preconception care was about one-third of cases in the present study. Therefore, it seems necessary to conduct the vigorous follow-up and motivation, to solve the problem of the low number of midwives, and to increase the mothers' knowledge in order to promote this program.

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