



## Original Research Article

## Adequacy of Prenatal Care in Pregnant Women Referring to Health Centers

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## ABSTRACT

The aim of this study was to investigate the adequacy of prenatal care in pregnant women referring to health centers in Qom in 2016. It was a descriptive-analytical cross-sectional study. The data were collected using a questionnaire consisting of four sections of pregnancy care characteristics (time of first care and number of care and calculation of care adequacy), demographic characteristics, midwifery and medical records, and factors preventing the correct receipt of prenatal care. The sample was 261 mothers who had referred to health centers in Qom in 2016 for prenatal care. This study applied stratified sampling method. The data was analyzed using SPSS software. The results showed that 26.1% of pregnant women accounted for insufficient care adequacy, 18.8% with moderate adequacy, 50.2% with adequate care and 5% with excessive adequacy of pregnancy care. Regarding the demographic characteristics of mothers, there was no significant difference between the adequacy of prenatal care for employed and housewives, Iranian and non-Iranian women, women living in rented houses and private homes. The adequacy of maternal antenatal care was not significantly related to any of the variables of midwifery and medical records. Only mothers with a history of natural childbirth had a higher rate of pregnancy adequacy than others. There was no significant difference between the adequacy of prenatal care and the factors that prevented this care.

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## GRAPHICAL ABSTRACT



### Introduction

Providing health care during pregnancy is one of the main health issues in any society and is considered as a health indicator. Prenatal care can reduce maternal and neonatal mortality and complications if done regularly. Pregnancy care is supported worldwide as a means of improving perinatal outcomes [1-3]. The main points in prenatal care, in addition to improving health and performing medical care, are empowering the individual to maintain and ensure their health through the provision of training and counseling. The purpose of antenatal care is to identify and correct lifestyle, behavioral, medical, and social risks that threaten women's health or the outcome of pregnancy, and its ultimate goal is to reduce maternal mortality and morbidity in association with delivery [4-6]. Pregnancy advice can be provided to pregnant women by any health care professional with the goal of optimizing the outcome of pregnancy. According to population growth policies, an active approach should be taken in this regard. The main purpose of providing care during this period is to give birth to a healthy baby without endangering the mother's health [7-9]. According to the World Health Organization (WHO), in 2005, 536 thousand pregnant women in the world lost their

lives due to complications of pregnancy and childbirth; of these, 241,000 were from Asia and 1,900 from Iran. The maternal mortality rate is 140 per 100,000 live births in Iran, while in Turkey it is 44 per 100,000 live births and in the United States it is 11 per 100,000 live births [10]. It seems that one of the factors affecting the difference in maternal mortality is the difference in the level of health services [11]. Because pregnancy increases the health needs and physical and mental problems of mothers, the study of care during this period is the best guarantee to maintain the health of the mother and give birth to a healthy baby. It is now accepted that providing prenatal care is more cost-effective than any intervention to reduce maternal mortality and morbidity, as well as prenatal and postnatal mortality and morbidity [12-14]. In the 21st century, despite many economic and technological advances, 44 million women in developing countries still do not have access to prenatal care, and about 200,000 women in Asia die each year from complications of pregnancy and childbirth. Lack of care during pregnancy and childbirth also causes the death of nearly 5 million babies annually before birth or during childbirth or in the first week of life. Inadequate care during pregnancy is significantly associated with low-birth-weight infants and this

low weight is one of the main determinants of mortality and disability in infancy and childhood, which has long-term effects on puberty health indicators [15-18]. It also creates heavy costs in the health sector and imposes a significant burden on the society in general [19-22]. Despite the provision of care in various forms by health centers, it seems that identifying factors preventing the proper and timely receipt of care during pregnancy through research and providing solutions is of great significance. In order to eliminate the obstacles, in addition to reducing the mortality rate of mothers and infants and preventing the birth of premature and low birth weight infants, we should also help reduce the need for children to be hospitalized in the next years of their lives [23-26]. Since these cares have a tremendous effect on improving the health of mothers and children, by evaluating the effective factors in taking care of these cares, it is possible to strengthen the motivating factors while determining the current situation. Promoting maternal health is one of the important health goals and one of the important steps to achieve this goal is to take care of pregnancy. Pregnancy care plays an important role in healthy pregnancy and the health of the future baby. There are also challenges with mothers' awareness of the factors influencing the implementation of prenatal care and their educational needs to increase participation in this care.

### Research method

This research was a descriptive-analytical cross-sectional study in which data related to the year 1995 was collected. The statistical population in this study included all mothers who referred to health centers in Qom in 2016 for pregnancy care. We received letter of consent of the participants before doing the study. Their pregnancies were single, they did not have systemic diseases and they did not take any special medicine. Mothers who did not want to answer were excluded from the study. The

research environment was health centers in Qom and the sampling method was stratified. Data in this study was collected through a researcher-made questionnaire consisted of four parts: The first part of the characteristics of pregnancy care (time of first care and the number of care and calculation of adequacy of care), the second part of demographic characteristics, the third part of obstetric and medical records and the fourth part questions about the barriers to getting the right pregnancy care. To assess the validity of the questionnaire, the questions designed by several faculty members were reviewed and then the reliability of the questionnaire was confirmed using Cronbach's alpha test. The sample size was determined with the opinion of 265 people (with an accuracy of 1.645) and stratified sampling method was used. Based on this, each of the different areas of Qom Municipality (8 areas) was considered as one floor and a health center was randomly selected from each area. Then, from each center, the last 33 completed cases of prenatal care were used, and at the same time, according to the date of the mother's presence in the center, the parts of the questionnaire that should have been done through interviews with the mother were completed. The data collected was fed into SPSS software for analysis. Measures of central tendency and dispersion, independent t-test, Turkey, Pearson, Fisher, Lance and variation were computed and graphs and statistical tables were presented. The data was kept confidential.

### Literature Review

Hakari et al. (2011) worked on barriers to pregnancy care and its relationship with pregnancy outcome in women referred to a number of Tabriz hospitals on 140 women. They showed that pregnancy care could improve the quality of client-centered counseling and encourages women to access prenatal care. They emphasized safe maternal programs based on the educational and communication content of pregnancy care [27]. Afrooshteh and Zafar

(2008) investigated the effective factors in improving the perceived quality of prenatal care based on the cross-sectional model with all rural pregnant women in Gachsaran. The results showed that in all aspects of service quality there was a gap between perceptions and expectations of rural pregnant women. In other words, their expectations of services were higher than what they received in practice, and the largest gap was in the dimension of tangible factors and the smallest in the dimension of accountability [28]. Farrokhi and Khodiuozadeh(2019) aimed at determining the quality of midwives' performance in providing prenatal care in Mashhad health centers, the performance of 4 midwives who were selected from 8 urban health centers by stratified random method. The most favorable performance of midwives was in the areas of referral for pregnancy tests, fetal health assessment, control of vaccination status, determination of possible delivery date and taking the history and the most unfavorable performance status of midwives were related to physical examinations, review of common complaints, work advice and advice for the place of delivery [29].

Torres(2016) delved into barriers to accessing prenatal care in Latin American adults, which aimed to identify real and perceived barriers to prenatal care on 54 adult samples between 18 and 21 years old. More than 95% of them experienced personal and organizational barriers when trying to access prenatal care [30]. In a qualitative study, Heberlin et al. (2016) aimed to develop a framework of women's experiences with individual pregnancy care compared to women's experiences in group prenatal care. Both groups gave a similar description of the usefulness of three prenatal care practices: Emphasis on health, prevention and control of medical problems, and the establishment of a supportive relationship by caregivers. In the fourth function, education and preparation, women experienced more benefits in group care

and more positive effects on stress, trust, described self, knowledge, motivation, informed decisions, and interaction in health care [31].

Alussen et al. (2016) addressed the effects of maternal mental health on participation in optimal treatment methods during pregnancy. 166 pregnant women from 3 obstetrics and gynecology clinics in a mid-Atlantic university health system were selected by convenience sampling method. The findings showed that pregnant women with poor mental health (depressive symptoms, poor social support) and certain demographic social characteristics (eg, young age, overweight or obesity before pregnancy) were less likely to be active in participating in optimal health during pregnancy [32]. Til et al. (2015) investigated incentives to increase the use of prenatal care by women to improve maternal and infant outcomes and determining whether incentives are an effective tool to increase the timely use of prenatal care. Are pregnancies among women. Out of a total of five screening centers, including 11,935 pregnancies, only 1,893 pregnant women participated in the study. Incentives for this study included cash, gift cards, baby carriers, baby blankets, and taxi vouchers. There is limited evidence to suggest that incentives may increase the use and quality of prenatal care, but may instead increase the rate of cesarean section. There is a need for more information with high quality studies to evaluate the effect of incentives offered to pregnant women to attend antenatal care visits and its effects on maternal and infant health [33].

Alzola and Elry (2014) studied the factors affecting the use of prenatal care services in the Guagualada Region of Nigeria with 230 newborn women aged 15 to 49 years, the level of education and employment of the spouse. They positively affected the pattern of using these services. The importance of antenatal care, the attitude of health workers and the cost of care were the most important factors that influenced

the use of services. A review study by Abu and Gross (2015) examined the various factors affecting access to antenatal services and obstetric care among women of childbearing age in sub-Saharan Africa. The results showed that the level of education of women and their husbands, transportation problems, economic status, wealth, income, age, distance, quality of care, cost and religious background were effective in access to antenatal services and obstetric care. Inequality in access to antenatal care and obstetric care was a factor affecting women's reproductive health in sub-Saharan Africa. Improvements in the social, economic, and political environment were essential to addressing the many barriers that women faced and to promoting safe motherhood. Mbiza et al. (2014) worked on barriers to health search practices during pregnancy among adolescents in rural Malawi with 240 available samples. These barriers were due to individual factors such as low level of education, inability to decide according to inadequate knowledge and psychological factors such as shyness, fear, stigma, and health-related factors such as long distances to these services, lack of teen-friendly services, and inaccessible roads. Lango et al. (2013) aimed at discovering the quality of prenatal care services for pregnant women at Boila Obstetrics and Gynecology Hospital. 369 pregnant women were studied as available sample. The findings showed that in general, the service delivery structure was higher than the WHO standard (in 87%) while the service delivery process was below the standard in terms of performance (in 60%). Community mobilization, training of health care providers, and a steady source of material resources were needed to provide centralized antenatal care services, which were recommended for the further improvement of infants and mothers. The results of a cross-sectional study by Alvatosin et al. (2013) on factors affecting the initiation of prenatal care in Ibadan, Nigeria" conducted on

160 pregnant women showed that husband training's influence led to reservation of care. The experience of losing a child and having an abortion were significant predictors of when to start prenatal care. The Centers for Disease Control and Prevention (2000) stated that the causes of inadequate care vary depending on social and racial group, age, and method of payment. The most common causes listed are lack of pregnancy information, lack of money, or insurance for care, and being unable to reach appointments (1). Chao et al. (2014) examined the factors affecting the quality of postpartum care on women's awareness" on 3202 Chinese women. The results showed that health priorities for mothers to receive care should be determined according to regional and local needs.

In Iranian context, Khanjari et al. (2006) reported that some personal characteristics of receiving women created barriers to obtaining prenatal care. Likewise, Mushki et al. (2010) studied the relationship between health control beliefs and lifestyle in pregnant women with 115 pregnant women who referred to Gonabad health centers by simple random sampling. The results showed that control beliefs internal health in pregnant women in Gonabad was higher than the two criteria of effective people belief and chance belief.

## Results

The description of the midwifery profile is shown in Table (1). As can be seen, of the pregnancy records of mothers who referred to the centers, 0.8% of the respondents stated that the current pregnancy was their first pregnancy and they had never had another pregnancy. At the same time, regarding pregnancy records, 36% stated that once, 34.1% twice, 20.7% three times, 5.4% four times, 2.3% five times, 0.4% six times and 0.4% had had seven pregnancies. Regarding the respondents' birth records, 6.5% of the clients had never given birth. Also, 39.8% of them had had one delivery, 32.2% two deliveries, 18% three deliveries, 3.1% four deliveries and 0.4%

five deliveries. 94.3% of mothers had not had a stillborn child in their pregnancy history. 4.6% had a stillbirth, 0.8% had two stillbirths and 0.4% had three stillbirths. 0.8% of the mothers who referred to the centers had never given birth to a live child. In that case, either they were not pregnant or their child died or had an abortion. Also, 40.2% with a live child, 30.7% with two live children, 17.2% with three live children, 3.4%

with four live children and 0.4% with five live children were observed in their pregnancy records. Regarding the history of abortion, 83.9% of the respondents who referred to the centers stated that they had never had an abortion. Meanwhile, 13% of respondents had had one abortion, 2.7% have had two abortions and 0.4% had had three abortions.

**Table 1:** Frequency of respondents' midwifery characteristics

Valid percentage	Frequency percentage	Abundance	Property
0.8	0.8	2	Gravida
36.8	36.0	94	
70.9	34.1	89	
91.6	20.7	54	
96.9	5.4	14	
99.2	2.3	6	
99.6	0.4	1	
100.0	0.4	1	
	100.0	261	
6.5	6.5	17	Number of deliveries
46.4	39.8	104	
78.5	32.2	84	
96.6	18.0	47	
99.6	3.1	8	
100.0	0.4	1	
	100.0	261	
94.3	94.3	246	Number of children dead
98.9	4.6	12	
99.6	0.8	2	
100.0	0.4	1	
	100.0	261	
8.0	8.0	21	Number of children dead
48.3	40.2	105	
78.9	30.7	80	
96.2	17.2	45	
99.6	3.4	9	
100.0	0.4	1	
	100.0	261	
83.9	83.9	219	Number of abortions
96.9	13.0	34	
99.6	2.7	7	
100.0	0.4	1	
	100.0	261	

In Table 1, due to the ascending nature of the described features, the cumulative percentage column is used. Questions were asked about the respondents' medical records, which were answered with yes and no.

The answers are as follows: Only 7.3% of the respondents had a problem in the previous pregnancy and the rest (92.7%) were either in their first pregnancy or did not have any problems in the previous pregnancies. Six of the 261 respondents (2.3%) had a history of

infertility and the remaining 97.7% had not had such a problem. Less than 9% of the respondents (8.8%) had a history of disease and other respondents did not have a history of any specific disease.

About 40% of the respondents had a history of surgery in their medical records, and most of these surgeries were related to people with a history of cesarean section. Only 10% of respondents had a history of drug use and the remaining 90% had no history of drug use.

**Table 2:** Frequency of respondents' medical records

Frequency percentage	Abundance	Property
92.7	242	History of problems in previous pregnancies
7.3	19	
100.0	261	
97.7	255	History of infertility
2.3	6	
100.0	261	
91.2	238	disease background
8.8	23	
100.0	261	
60.2	157	History of surgery
39.8	104	
100.0	261	
90.0	235	History of drug use
10.0	26	
100.0	261	

From Table (2), regarding the method of previous deliveries and also the distance between the current pregnancy and the previous pregnancy, it can be stated that 50.2% of mothers in previous deliveries were the only natural method, 31.8% were the only cesarean section

and 4 5% had experienced both natural and cesarean section. Therefore, it can be stated that 55.6% of mothers had a natural method and 37.2% had a cesarean section in their previous deliveries. Also, 12.6% of the respondents did not have a previous delivery.

**Table 3:** Frequency of previous deliveries and pregnancy interval

Frequency percentage	Abundance	Property
12.6	33	
50.2	131	Method of previous deliveries
31.8	83	
5.4	14	
100.0	261	
42.1	110	
3.1	8	
0.4	1	
8.4	22	
6.9	18	
10.0	26	
6.1	16	
6.9	18	
3.4	9	The interval between the current pregnancy and the last pregnancy
2.3	6	
3.8	10	
1.9	5	
1.5	4	
0.8	2	
1.1	3	
0.4	1	
0.4	1	
0.4	1	
100.0	261	

The variable of care adequacy is obtained by dividing the number of cares performed by the number of cares recommended in Iran (8 cases) multiplied by 100. The average adequacy of care among the respondents was equal to 76.77, which is a mean deviation of 36.85. Also, the minimum level of care adequacy was 0 and the maximum was 312.5. This means that a number

of pregnant mothers have not referred to the centers even once during the whole pregnancy, and instead a mother has referred to such centers 25 times during this period. In Mello's study, 73.6% of adequate care was the level of inadequate care in most cases of maternal care. 36% of the findings showed that 53.4% of women had received insufficient prenatal care.

Based on the classes of the adequacy index of care adequacy in this study, the amount of

adequate care was allocated to the most cases of care of the mothers under study.

**Table 4:** Frequency describing the care adequacy variable

Deviation from the standard	Average	the most	The least	Number of replies	Adequacy of care
36.85	76.77	312.5	0	261	

The range of scores obtained for the care adequacy scale is divided into four groups: Under-adequacy, moderate-adequacy, sufficient-adequacy and over-adequacy. Therefore, after summarizing the scores related to the subscales, the score obtained was shown in the following four groups: 26.1% of pregnant women with inadequate care, 18.8% with moderate adequacy, 50.2% with adequate care and 5% with adequate care with prenatal care. The first column of Table 3 shows the numerical intervals containing each category. In order to be more familiar with the population of the study population in this section, the variables that have been collected in four different sections of the questionnaire are described: first, the adequacy of care in 2 questions, then demographic (identity) characteristics and cultural, social and economic status in the form of 12 questions, then midwifery characteristics and medical records in 12 questions, and finally the factors preventing the correct receipt of prenatal care in 15 questions. The question was weighed. The variable of care adequacy is obtained by dividing the number of cares performed by the number of cares recommended in Iran (8 cases) multiplied by 100. The average adequacy of care among the respondents was equal to 76.77, which is a mean deviation of 36.85. Also, the minimum level of care adequacy was zero and the maximum was 312.5. This means that a number of pregnant mothers did not go to the centers even once during the whole pregnancy, while a mother referred to such centers 25 times during this

period. The range of scores obtained for the care adequacy scale was divided into four groups: Under-adequacy, moderate-adequacy, sufficient-adequacy, and over-adequacy. After summarizing the scores related to the subscales, the score obtained was shown in the following four groups: 26% of pregnant women with inadequate care, 18.8% with moderate adequacy, 50.2% with adequate care and 5% with excessive adequacy with prenatal care. In Melo study, 73.6% of mothers had adequate care [42-44]. In the study by Khalesi et al., based on the classes of the adequacy index of care adequacy, the amount of adequate care was 44.9%. Most of the cases were cared for by the mothers under study, but in Taybi et al.'s study (2019), the amount of inadequate care (36%) was allocated to most of the mothers' care [34]. In Ward's study, 53.4% of women received insufficient prenatal care [45-47]. The most age group among the respondents was 25 to 30 years old. So, 73 people (28.3%) of the respondents were 25 to 30 years old. Also, the age group over 40 years with 12 people (4.7%) had the lowest frequency. Like the age of the respondents, the spouses of the respondents had the highest frequency between the ages of 25 and 30. 78 (31%) of them were 25 to 30 years old. After this category, respectively, 29.8% of the spouses were between 30 and 35 years old, 19.4% were between 35 and 40 years old, 14.3% were more than 40 years old and 5.6% were less than 25 years old. Regarding the age of marriage among the respondents, 7.4% of them were under 15 years old, 51.4% between 15 and 20 years old, 28% between 20 and 25 years old,

11.3% between 25 and 30 years old and 1.9 percent were married after the age of 30. Thus, more than half of the respondents were married between the ages of 15 and 20. Regarding the level of education, about 72% of the respondents (1.9% illiterate and 70% with primary to diploma education) had no university or seminary education. This means that only 28% of the respondents had university and seminary education. Although the percentage of illiterate people was higher than the respondents' wives, the percentage of respondents' wives with university and seminary education was also higher than the respondents in this section. 58.8% of the respondents' spouses had primary education up to diploma, 29.2% had university education, 6.5% had seminary education and 5.4% were illiterate.

In terms of job status, only 6.9% of the respondents were employed and 93.1% of them were housewives. 48% of the respondents' spouses were self-employed, 19.9% were employees, 9.5% were workers and 1.4% were unemployed. 21.3% of these wives were also clerics and were not engaged in any particular profession. The results obtained regarding the racial and residential status of the respondents showed that 89.7% were Iranians and 10.3% were non-Iranians.

Among 261 respondents, 86.6% were born in the city and 13.4% were born in the village. Most of the pregnant women participating in this study lived in the city (98.5%) and only 1.5% of them lived in the village. 54.8% of the respondents owned rented property and 43.7% owned personal property. Regarding the pregnancy records of mothers who referred to the centers, 0.8% of the respondents stated that the current pregnancy was their first pregnancy and they had never had another pregnancy. 36% had a history of pregnancy once, 34.1% twice, 20.7% three times, 5.4% four times, 2.3% five times, 0.4% six times and 0.4% seven times.

Regarding the respondents' delivery records, 6.5% of the clients had never given birth. Also, 39.8% had a history of one delivery, 32.2% had a history of two deliveries, 18% had a history of three deliveries, 3.1% had a history of four deliveries and 0.4% had a history of five deliveries. 94.3% of mothers did not have a stillborn child in their pregnancy history. 4.6% had a history of one dead child, 0.8% had a history of two dead children and 0.4% had a history of three dead children. 0.8% of mothers referred to the centers had never given birth to a live child. Either they were not pregnant or their child was dead or had an abortion. Also, 40.2% had a live child, 30.7% two live children, 17.2% three live children, 3.4% four live children and 0.4% five live children were observed in their pregnancy records. Regarding the history of abortion of mothers referring to the centers, 83.9% of the respondents never had an abortion. 13% had a history of one abortion, 2.7% had a history of two abortions and 0.4% had a history of three abortions. Questions were asked about the respondents' medical records, which were answered with yes and no. Only 7.3% of the respondents had problems in the previous pregnancy and the rest (92.7%) either had their first pregnancy or had no problems in the previous pregnancies. 6 out of 261 respondents (2.3%) had a history of infertility and the remaining 97.7% did not face such a problem. Less than 9% of the respondents (8.8%) had a history of disease and the other respondents did not mention a specific history of disease. About 40% of the respondents had a history of surgery in their medical records, most of which was cesarean section. Only 10% of respondents had a history of drug use and the remaining 90% had no history of drug use. Regarding the method of previous deliveries and also the distance between the current pregnancy and the previous pregnancy, it can be stated that 50.2% of mothers in previous deliveries accounted for the only natural method, 31.8% for the only cesarean

section and 5.4% for both natural methods and have experienced a cesarean section.

Therefore, it can be stated that 55.6% of mothers had a natural method and 37.2% had a cesarean section in their previous deliveries. Also, 12.6% of the respondents did not have a previous delivery. In describing the factors preventing the correct receipt of prenatal care, the rate of yes answers to each of the preventive factors was as follows: 13% unwanted pregnancy in the eyes of the mother, 11.5% unwanted pregnancy in the eyes of the father, 12.3% feeling healthy and no need to refer, 14.9% no information about pregnancy, 8.4% lack of knowledge about providing care in health centers, 12.3% do not have enough time to refer, 13% do not have a person to take care of children at home, 13.3% of travel expenses for referral, 6.5% of travel problems for referrals, 5.7% distrust of the caregiver, 2.7% of inappropriate treatment of the care provider, 5.7% distance, 15.7% long wait for care, 0.4% of spouse violence and 6.9% lack of knowledge about how to refer.

Therefore, the factor of long wait for receiving care and then the factor of not knowing about pregnancy has been declared as one of the important factors preventing the proper receipt of prenatal care. Regarding the relationship between demographic characteristics and adequacy of prenatal care using analysis of variance, Tukey test (Fisher's value of this test is  $F = 4.262$  and its significance level was 0.001), we found that the average adequacy of care in mothers under 20 years, more than other mothers. In other words, with increasing age of mothers, the adequacy of their prenatal care had decreased.

Using analysis of variance test (Fisher statistic value of this test is equal to  $F = 3.514$  and its significance level is 0.016), we found that the level of care adequacy in different educational levels of mothers was different. The average adequacy of care for illiterate mothers was much higher than the other three categories, and the

adequacy of care for mothers with primary education up to diploma was in the second category, university in the third category and seminary in the fourth category.

In other word, with the increase in mothers' education, the adequacy of their prenatal care had decreased. However, the effect of religious education on reducing the adequacy of care can be considered more than university education. In contrast, in the study by Hekari et al., most illiterate or married mothers with primary education had received insufficient care. In Taybi et al.'s study, there was no significant difference between the education of the mothers under study and the adequacy index of care adequacy. Regarding the adequacy of prenatal care and employment of pregnant women using two independent samples t-test and Leven test, it was found that there was no significant difference between the adequacy of prenatal care for employed and housewives. Also, there was no significant difference between pregnancy adequacies in different levels of maternal employment.

In Taybi et al.'s study, mothers' employment had the highest percentage in the Nakafi care group, but there was no significant difference between the mothers' jobs and the adequacy of care adequacy index. In Net's study, there was no statistically significant difference between the four groups of intensive care, adequate, moderate and inadequate in terms of age, employment and education. Regarding the effect of spouses' age on the adequacy of pregnancy care using the analysis of variance test (Fisher's statistic value of this test is equal to  $F = 3.496$  and its significance level was 0.008), we found that the adequacy of mothers' care at different age levels of their husbands was different.

Tukey test showed that with the age of the spouses, the adequacy of their prenatal care decreased. In the study of Hakari et al., the age of the spouse in intermediate care was the lowest and in oversupply, sufficient and insufficient

care, respectively, which was statistically significant. Regarding the effect of spouses' education on the adequacy of pregnancy care using the analysis of variance test (Fisher's value of this test is equal to  $F = 3.59$  and its significance level is 0.014), it was found that the adequacy of mothers' care at different levels of education of spouses was different.

The average adequacy of maternal care among illiterate spouses was higher than the other three categories. Also, the adequacy of maternal care among spouses with primary education up to diploma was in the second rank, university in the third rank and seminary in the fourth rank, respectively. In other words, with the increase in education of husbands, the adequacy of women's antenatal care decreased. According to these results, the effect of religious education on reducing the adequacy of maternal care can be considered more than university education. In contrast, in the study of Hakari et al., most mothers with spouses with primary education received inadequate care.

Regarding the effect of spouses' job on the level of adequacy of pregnancy care using analysis of variance test (Fisher's statistic value of this test is equal to  $F = 1.960$  and its significance level was 0.061), it was found that the level of adequacy of maternal care according to type of employment their wives was not different. However, in the study by Hakari et al., regarding the majority of mothers whose spouses were employees received insufficient prenatal care, and there was a significant difference between the employment status of the wife and the status of receiving prenatal care.

Regarding the effect of urban area on the adequacy of pregnancy care using analysis of variance test (Fisher statistic value of this test is equal to  $F = 9.462$  and its significance level is 0.000 and significance level is less than 0.05), it was determined that the amount of adequacy of care varied in different areas of mothers' urbanization. Using the effect of different urban

areas of the respondents on the level of adequacy of their care, it can be stated which of the health centers had the most impact on the adequacy of maternal care during pregnancy. In the study by Hakari et al., there was a significant difference between the centers receiving care and the status of receiving care. Regarding the adequacy of pregnancy care and marriage age of mothers using Pearson test, a significant and negative relationship was observed between the adequacy of maternity care and the marriage age of mothers. Conversely, as the age of marriage decreased, the adequacy of their prenatal care increased.

Regarding the effect of Iranian and non-Iranian women being pregnant on the adequacy of prenatal care using t-test, we found no significant difference between the adequacy of prenatal care of non-Iranian and Iranian women. In the study by Mello et al. on received inadequate care from non-whites, regarding the adequacy of prenatal care in urban and rural women, two independent samples showed that the adequacy of prenatal care for women born in rural areas was higher than women born in urban areas.

Regarding the adequacy of care for women living in rented houses and personal property during pregnancy, using t-test, we found type of residence of mothers did not affect the adequacy of care during pregnancy. (Significance level 0.143 and more than 0.05). However, in the study by Hakari et al., the majority of those living in rented housing received inadequate prenatal care. Regarding the effect of midwifery and medical records on the adequacy of prenatal care using Pearson test, we found that the adequacy of maternal prenatal care was not significantly related to any of the variables of number of pregnancies, number of deliveries, number of stillbirths, number of live children and number of abortions. Regarding the adequacy of pregnancy care and the distance to the last pregnancy using Pearson test, it was found that there was no significant relationship between the adequacy of

pregnancy care and the distance between the current pregnancy and their last pregnancy. In the study by Mello et al., the distance from the previous pregnancy had no effect on the adequacy of prenatal care. Regarding the adequacy of prenatal care in women with and without problems in previous pregnancies, two independent samples were found having no significant difference between the adequacy of prenatal care in women with previous pregnancies and women without problems, but in Hakari et al.'s study on mothers who had too much care had complications in their previous pregnancies and there was a significant difference between the variables of complications in previous pregnancies and the status of pregnancy care. Regarding the effect of infertility history on the adequacy of pregnancy care using t-test, we found that there is no significant difference between the adequacy of pregnancy care for women with a history of infertility and women without a history of infertility.

Regarding the effect of medical history on the adequacy of pregnancy care using t-test, we found that there was no significant difference between the adequacy of prenatal care for women with a history of disease and women without a history of disease. Regarding the effect of drug history on the adequacy of pregnancy care using t-test, we found that there was no significant difference between the adequacy of pregnancy care in women with a history of drug use and women without a history of drug use. Regarding the effect of previous delivery status on the adequacy of pregnancy care using analysis of variance test (Fisher statistic value of this test is equal to  $F = 2.636$  and its significance level is  $0.049$ ), it was found that the average adequacy of care in mothers with previous delivery natural alone was more than others. Also, the adequacy of care for mothers with both normal delivery and cesarean section was in the second place, cesarean section alone was in the third place and

there was no previous delivery in the fourth place, respectively.

In Taybi et al.'s study, there was a significant relationship between the type of delivery and the specificity of usefulness, so that by calculating the relative risk, it was determined that the probability of cesarean section in inadequate care was 37.1 times higher than adequate care. The Net's study did not show a significant relationship between the type of delivery and the adequacy index of prenatal care. In the study, although 62% of mothers who had a normal delivery received insufficient care, there was no significant difference between the type of delivery and the status of receiving maternity care. Leven test and two-sample t-test were used in connection with the effect of inhibitory factors on the correct receipt of prenatal care on the adequacy of pregnancy care. There was no significant difference between the adequacy of antenatal care for women who considered pregnancy to be unwanted and women who considered pregnancy to be unpredictable (the significance level of the care adequacy variable was 0.568 and this rate was more than 0.05). However, in the study, those who had a planned pregnancy received intermediate pregnancy care (4) and in the Melo's study, most unwanted pregnancies were associated with inadequate care. There was no significant difference between the adequacy of prenatal care in women who considered pregnancy unintended from the father's point of view and women who were not (the level of significance of the care adequacy variable was 0.522 and this rate was more than 0.05). The adequacy of prenatal care in women who felt healthy and did not need to visit was not significantly different from women who did not feel healthy ( $\text{sig} = 0.388 > 0.05$ ). There was no significant difference between the adequacy of prenatal care in women who were not aware of their pregnancy and women who were aware of this (the significance level of the care adequacy

variable was 0.790 and this rate was more than 0.05).

However, Taybi believed that one of the factors reducing the adequacy of care is the late onset of care in mothers, which can be attributed to factors such as late knowledge of the mother about her pregnancy. There was no significant difference ( $\text{sig} = 0.095 > 0.05$ ) between the adequacy of prenatal care for women who were unaware of the provision of care in health centers with women who were aware of the care of pregnant women in these centers. There were no significant differences between inhibitors and women who did not believe in this issue (the significance level of care adequacy variable was 0.068 and this rate is more than 0.05). However, in this study, 57% of mothers who received inadequate care did not have enough time to visit. The adequacy of antenatal care for women who did not use a person to care for their children at home was not significantly different from that of women who assisted in caring for their children at home ( $\text{sig} = 0.843 > 0.05$ ). There was no significant difference between the adequacy of antenatal care for women who introduced travel expenses as one of the deterrents and women who did not have this problem (the significance level of the care adequacy variable was 0.795 and this amount was more than 0.05). There was no significant difference between the adequacy of antenatal care for women who stated that one of the inhibiting factors was the difficulty of traveling to and from women who were not ( $\text{sig} = 0.29529 > 0.05$ ). But in this study, mothers who received inadequate care had 47% difficulty getting around. Adequacy of prenatal care in women who reported distrust of the caregiver as one of the factors preventing proper prenatal care were different from women who did not have such an opinion ( $\text{sig} = 0.023 < 0.05$ ). The average care adequacy of women who stated that they did not trust the caregiver as a deterrent to receiving it correctly was 55.83 and women who were not

was 78.05; therefore, the adequacy of antenatal care in women who did not consider distrust of the caregiver as a deterrent to proper care (no answer) was higher than the group who answered yes. In the Hekari study, 56% of the subjects mentioned social and family issues as the most important reason for not referring or regular referrals, including lack of trust in doctors or midwives.

There was no significant difference between the adequacy of antenatal care for women who cited the inappropriate attitude of the caregiver as one of the factors preventing proper antenatal care and women who did not have such an opinion ( $\text{sig} = 0.404 > 0.05$ ). There was no significant difference between the adequacy of antenatal care in women who introduced distance as one of the deterrents and women who did not have this problem (the significance level of care adequacy variable was 0.848 and this amount was more than 0.05). In the Hakkari study, mothers who received inadequate care reported a 25 percent distance from home. They did not believe in this; there was no significant difference ( $\text{sig} = 0.873 > 0.05$ ). Mothers who received inadequate care reported 29% of long-term waiting at the clinic. There was a difference between the adequacy of antenatal care for women who reported spousal violence as a deterrent and women who did not. There was no significance (the significance level of the care adequacy variable was 0.529 and this rate was more than 0.05). In the study by Hakari et al., the most important reason for not visiting or referring to irregularly was social and family issues, including the lack of permission of the husband or other family members. Adequacy of prenatal care in women who reported lack of knowledge about the correct way to refer as one of the factors preventing proper prenatal care were different from women who did not have such an opinion ( $\text{sig} = 0.266 > 0.05$ ). In Hakari et al.'s study, poor knowledge of pregnancy care was associated with inadequate care and there was a significant correlation between the

variable of mother's maternal awareness of pregnancy care and pregnancy care status.

### Conclusion

The above results indicate that women in our society are aware of the importance of prenatal care to such an extent that deterrents such as spousal violence, long waits for care, distance, cost and travel problems, not having enough time to visit, not having someone to care for children at home, lack of prior knowledge about providing care in health centers, feeling healthy and not needing to refer, lack of awareness of pregnancy, unwanted pregnancy, unwanted pregnancy from the father's point of view and even inappropriate treatment of the care provider, none of the adequacy Pregnancy care is not effective, and more interestingly, the sensitivity to the issue is such that distrust of the caregiver increases the adequacy of prenatal care. On the other hand, when there is enough knowledge about the correct way to go to health centers, this amount is affected, which indicates the importance of education in health, even in simple cases such as the correct way to go to health centers. The study ends with the following suggestions:

1. Teaching the importance of prenatal health in marriage education.
2. Educating mothers about the correct way to go to health centers for prenatal care.
3. Providing solutions to increase the information of mothers and their spouses about prenatal care even in the educated class.

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