

## Factors Influencing the Behavior of Pregnant Women towards Using Prenatal Care Services In Iranian Healthcare Centers

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### ABSTRACT

**Background & aim:** Care provision is one of the most important factors in preventing and reducing mortality among pregnant mothers. Despite availability, the uptake of health services in health centers is undesirable. This study aimed to investigate the factors influencing the behavior of pregnant women towards using prenatal care services based on health belief model in healthcare centers of Tuyserkan, Hamadan Province, Iran.

**Methods:** In this descriptive, analytical, cross-sectional study, 165 mothers visiting the health care centers of Tuyserkan, Hamadan Province, Iran, 1-15 days postpartum were chosen using the convenient sampling method during 2015. A self-structured questionnaire comprising items on demographics, knowledge, and health belief model constructs was employed for data collection. The data were analyzed using Pearson correlation coefficient, independent t-test, and logistic regression.

**Results:** The study revealed that 72.1% of the pregnant women had regular visits, while 27.9% had irregular visits. Logistic regression reflected that knowledge (OR=0.929) and self-efficacy (OR= 0.976) were effective variables on regular prenatal visits.

**Conclusion:** Considering pregnant women's physiological and anatomical conditions, prenatal care and regular visits are essential; thus, effective interventions in this area should be planned and implemented.

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## Introduction

Pregnancy is a natural phenomenon that is associated with happiness and joy in case no complications occur for the mother or baby (1, 2). During the prenatal period, mothers experience different physiological and psychological changes (3). Although usually pregnancy changes return to normal after a while, in some cases some problems remain several months after parturition. Disregarding the severity of these problems, their potential impact on daily activities of the mother is important (4).

Mortality rate is one of the most important

indicators of health and socio-economic development of each country (5). Maternal death encompasses any death occurring during pregnancy or 42 days after termination regardless of its cause (6). According to the reports of the World Health Organization (WHO), about 500,000 women annually die of pregnancy or childbirth complications. Most of these deaths occur in developing countries (7). Therefore, one of the most important goals of WHO was to reach a 75% reduction in the maternal mortality rate by 2015 (8).

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In Iran, to curtail maternal mortality and pregnancy complications, effective strategies were applied in terms of health pattern design. Based on the current statistics, mothers' death rate in Iran has significantly decreased over the past 40 years and reached from 237 to 23 in 2013, that is, 1973 cases per 100,000 live births. The aim of Ministry of Health of Iran in 2013 was to reduce maternal mortality rate to 15 per 100,000 live births (9).

In addition, other physical and mental issues happen to women during the prenatal period which undermine the quality of life in this sensitive and critical period (10). That is why most primiparous women are not ready to be mothers and need support from family, friends, and health care providers (11). Problems during pregnancy include headache, dizziness, backache, rhinorrhea, purulent discharge, foul odor, abnormal bleeding, urinary and bowel problems, and psychopathy (12). Delivery and pregnancy services are of the most important factors in preventing and reducing such problems. Therefore, caregivers' performance and the extent of environmental support are paramount to adapting with this period (13).

Ministry of Health and Medical Education in Iran has developed a comprehensive program for prenatal period that includes eight stages of care (weeks 6-10, 16-20, 26-30, 31-34, 35-37, 38, 39, and 40). This program includes examination, observation, question, training on personal hygiene and mental, sexual, and risk signs, common complaints, nutritional and medicinal supplements, fertility health services, and dental problems (12). If the prenatal care is performed regularly and systematically, it can significantly reduce the rate of maternal complications and neonatal death (14).

Prenatal care studies indicated most women have about nine visits during the prenatal period (15), while randomized controlled trials (RCTs) have shown that in developed countries and developing countries the number of visits can be reduced in low-risk pregnancies without posing any risks to the mother or baby (16, 17). Based on these studies, it seems that eight visits are adequate for a normal pregnancy (18). Despite the availability of health services for pregnant women, the use of health and midwifery services, especially in urban centers, is not satisfactory

(19). Therefore, it is paramount to increase educational programs and knowledge among women regarding the importance of prenatal care. In fact, the value of health education programs is hinged upon program effectiveness, knowledge of the problem, and appropriate use of theories and models (20).

A few models and theories have been developed to explain health behaviors. The health belief model provides a theoretical framework for estimating the probability of an individual making use of healthcare services. This model has been applied by healthcare providers to describe, explain, and predict behaviors associated with healthcare based on the perceptions and belief patterns of individuals. Based on this model, an individual will take action to avoid disease if the individual believes that 1) he or she is personally susceptible, 2) the occurrence of the disease will have at least moderate severity affecting some aspects of life, 3) taking a particular action will be beneficial by reducing his or her susceptibility to the condition, and 4) the action does not entail overcoming important barriers (cost, inconvenience, pain, or embarrassment). In addition, a cue to appropriate action appears to be essential (21-23). Consequently, mothers' belief on prenatal care is highly critical, and the application of this model in studying mothers' beliefs will be effective on prenatal care. With this background in mind, this study aimed to investigate the factors influencing the behavior of pregnant women towards using prenatal care services based on health belief model in healthcare centers in Tuyserkan, Hamadan, Iran.

## Materials and Methods

This cross-sectional, descriptive, analytical study was carried out among 165 postpartum women presenting to health centers of Tuyserkan, Hamadan Province, Iran, during 2015. Postpartum women (minimum 1-3 days and maximum 10-15 days after delivery) were chosen for prenatal care according to mother's care program. One health center and five urban health clinics of Tuyserkan were selected for the study. The inclusion criterion was lack of pregnancy

complications, and the exclusion criterion was unwillingness to participate in the study. For ethical considerations, written informed consent was obtained from all the participants.

In this study, mothers who had regular (in the first half of pregnancy from the two recommended prenatal visits, at least one visit, and in the second half of pregnancy from the six recommended prenatal visits at least five visits) and irregular visits (in the first half of pregnancy from the two recommended prenatal visits, they did not have any, and in the second half of pregnancy from the six recommended prenatal visits they had four or less visits) were interviewed postpartum. To select the target group, medical records of mothers visiting the health centers 1-3 or 10-15 days postpartum were selected. At first, mothers' health indicators were examined in the first quarter of 2015 at Tuyserkan health center, family health unit. This indicator was determined from mothers' files with respect to definitions of regular and irregular care of pregnant women. In urban centers of Tuyserkan, 70% and 30% of the mothers had regular and irregular prenatal visits, respectively, according to the 3-months indicator. In the urban centers of Tuyserkan Based on these information and the following formula, the standard sample size was calculated.

$$n = \frac{p(1-p)z_{1-\alpha/2}^2}{d^2}$$

In this formula, P is the percentage of mothers with regular visits (0.7), and q denotes the percentage of mothers with irregular visits (0.3). Finally, the sample size was calculated to be 165 persons.

The data collection instrument included a researcher-made questionnaire designed based on the papers related to the topic, valid books, and the booklet of integrated maternal health care chart of the Ministry of Health (12). The questionnaire was completed by researchers or family health workers through interviewing mothers visiting the urban health centers. The questionnaire consisted of items on demographic characteristics (6), knowledge (19), and structures of health belief model, in detail, perceived susceptibility (4), perceived severity (4), perceived benefits (4), perceived barriers (4), cues to action (4), and self-

efficacy (2).

The items on knowledge were rated using three options (Yes, No, and I do not know), and responses to the items on the structures of health belief model were rated using a 5-point Likert scale (i.e., Strongly agree, Agree, Undecided, Disagree, and Strongly disagree). For the items on knowledge, correct answers were scored 1 and wrong or lack of answers were scored 0. The possible total scores of this structure ranged from 0 to 19.

For the items on the health belief model structures (i.e., perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy), the scores ranged from 1 to 5; therefore, the maximum scores for the perceived susceptibility sub-domain with 4 items, perceived severity with 4 items, perceived benefits with 4 items, cues to action with 4 items, and self-efficacy with 2 items were 20, 20, 20, 20, and 10, respectively. The minimum scores in all of these sub-domains, except for self-efficacy, were 4. The higher scores in perceived susceptibility, perceived severity, perceived benefits, cues to action, and self-efficacy sub-domains indicated higher perception of care. The higher scores on perceived barriers indicated more perceived barriers to performing the behavior. It should be noted that to calculate the constructs of the health belief model, all of them were calculated from one hundred.

To establish the questionnaire's validity, we used content validity ratio (CVR) and content validity index (CVI). Therefore, the questionnaire was given to 10 health promotion and education professionals to review the questions for assessing the CVR and identifying the questions that obtained the required score. For CVI, relevance, simplicity, and transparency criteria were examined. The items obtained scores of above 79%. It was found that the questionnaire had good content validity.

To confirm the reliability of the questionnaire, we used Cronbach's alpha coefficient method. The questionnaire was completed by a sample of 30 mothers who presented for postpartum care. The Cronbach's alpha coefficients for knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy sub-domains were 0.76, 0.71, 0.73, 0.79, 0.70, 0.80, and 0.75, respectively.

To determine the relationship between variables, we used descriptive statistics, Pearson correlation coefficient, independent samples t-test, and logistic regression in SPSS version 21. P-values less than 0.05 were considered statistically significant.

## Results

In this descriptive analytical study, 165 mothers visiting health centers participated in this study with a response rate of 100%. We found that 72.1% and 27.9% of the participants had regular and irregular prenatal visits, respectively. The mean ages of the mothers who had regular and irregular visits were  $29.82 \pm 6.60$  and  $31.15 \pm 6.45$ , respectively.

Table 1 shows that 8.4% and 6.5% of the illiterate participants had regular and irregular prenatal visits, respectively. In addition, the lowest educational level among the husbands was primary school or illiteracy, which constituted 9.2% and 4.3% of the regular and irregular visiting groups, respectively. The most frequent economic status was moderate, which included 69.9% and 66.4% of the regular and irregular visiting groups, respectively. In addition, 84.8% and 90.8% of the regular and irregular visiting groups were housewives, respectively, and 45.7% and 37.8% of the regular and irregular visiting groups were having their second child, respectively.

**Table 1.** Demographic and background characteristics of the mothers visiting the health centers in Tuyserkan (165 participants)

Characteristics	Status of prenatal visits			
	Irregular		Regular	
	Number	Percentage	Number	Percentage
<b>Level of education for Mothers</b>				
Illiterate	3	6.5	10	8.4
Primary school	9	19.6	19	16
Middle school	7	15.2	16	13.4
High school	11	23.9	27	22.7
Diploma	6	13	30	25.2
University	10	21.7	17	14.3
<b>Level of education for husband</b>				
Illiterate	2	4.3	13	10.9
Primary school	10	21.7	11	9.2
Middle school	8	17.4	22	18.5
High school	5	10.9	14	11.8
Diploma	12	26.1	27	22.7
University	9	19.6	32	26.9
<b>Economic situation</b>				
Weak economic situation	5	10.9	17	14.3
Moderate economic situation	32	69.6	79	66.4
Good economic situation	9	19.6	23	19.3
<b>Employment status</b>				
Housewife	39	84.8	108	90.8
Laborer	1	2.2	3	2.5
Working	6	13	8	6.7
<b>Number of pregnancy</b>				
Primary pregnancy	10	21.7	44	37
Second pregnancy	21	45.7	45	37.8
Third pregnancy	9	19.6	16	13.4
Fourth pregnancy and more	6	13	14	11.8

Table 2 presents the mean scores of knowledge, perceived barriers, cues to action, and self-efficacy, indicating that they were higher in the regular visiting group compared to

those of the irregular visiting group. In addition, t-test reflected significant differences between the two groups in terms of knowledge and self-efficacy ( $P < 0.05$ ).

**Table 2.** Mean and standard derivation of structures of health belief model for the mothers visiting the health centers

Structures	Status of prenatal visits		Results of t-test
	Irregular	Regular	
	Mean±SD	Mean±SD	
Knowledge	70.82±16.37	82.22±10.65	P-value=0.000
Perceived susceptibility	42.79±11.85	41.33±12.86	P-value=0.504
Perceived severity	82.88±13.13	81.98±15.26	P-value=0.726
Perceived benefits	83.69±14.81	86.39±14.22	P-value=0.281
Perceived barriers	23.50±16.14	21.53±14.27	P-value=0.444
Cues to action	81.52±12.14	84.19±13.46	P-value=0.234
Self-efficacy	79.34±14.48	85.18±15.52	P-value=0.029

Univariate logistic regression analysis showed that knowledge and self-efficacy were effective on prenatal visits. To express the effect of knowledge on the response variable it can be stated that with increasing knowledge score of pregnant women, the chance of changing irregular visits to regular is 0.940 (decreases), and about self-efficacy, with each unit of increase in self-efficacy score in pregnant women, the

chance of changing irregular visits to regular is about 0.976.

Multifactorial logistic regression revealed that knowledge could affect prenatal visits. To express the effect of knowledge on response variable, it can be concluded that with each unit increase in pregnant women's knowledge, the chance of changing irregular visits to regular ones is 0.929 (Table 3).

**Table 3.** Results of multifactorial logistic regression of the variables affecting prenatal visits

Structures	OR Odds Ratio	P- value	95 CI for OR		
			Lower	Upper	
Knowledge	0.929	0.000	0.898	0.961	
Perceived susceptibility	1.016	0.364	0.982	1.050	
Perceived severity	1.037	0.062	0.998	1.078	
Perceived benefits	0.995	0.759	0.965	1.026	
Perceived barriers	0.996	0.777	0.968	1.024	
Cues to action	0.984	0.456	0.943	1.027	
Self-efficacy	0.986	0.378	0.956	1.017	
Age	0.950	0.247	0.870	1.036	
Employment status	Housewife (Ref)*	-	-	-	
	Laborer	0.450	0.395	0.071	1.831
	Working	0.303	0.457	0.013	7.055
Economic status	Good (Ref)*	-	-	-	
	Moderate	0.833	0.742	0.281	2.471
	Weak	0.699	0.637	0.158	3.095
	Fourth and more (Ref)*	-	0.115	-	-
Parity	Third	2.391	0.113	0.814	7.019
	Second	6.551	0.015	1.430	30.008
	Primary	4.175	0.131	0.653	26.671
Educational level of the mothers	0.256	0.098	0.051	1.284	
Educational level of the fathers	2.582	0.185	0.634	10.512	

\*Reference

There was a significant correlation between structures of health belief model about prenatal care (i.e., between knowledge and perceived severity and between perceived benefits and self-efficacy). However, there was no significant correlation between perceived susceptibility and other structures. Further,

the correlation of perceived severity with perceived benefits, cues to action, and self-efficacy, as well as the correlation of perceived benefits with cues to action and self-efficacy were significant; however, perceived barriers was negatively correlated with cues to action and self-efficacy. Finally, there was a significant correlation

between cues to action and self-efficacy (Table 4).

**Table 4.** The correlations between structures of health belief model about prenatal care

Structure	Knowledge	Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Cues to action	Self-efficacy
Knowledge							
Perceived susceptibility	-0.064						
Perceived severity	0.187*	-0.073					
Perceived benefits	0.174*	0.100	0.163*				
Perceived barriers	-0.046	0.117	-0.040	-0.111			
Cues to action	0.124	-0.104	0.442**	0.325**	-0.190*		
Self-efficacy	0.193*	-0.046	0.207**	0.239**	-0.293**	0.419**	

P<0.05 \*

P<0.01 \*\*

## Discussion

Pregnancy is a normal physiological process. Although many pregnancies do not require active professional health strategies, pregnancy influences the physical and mental health of pregnant women and their babies (24). Prenatal care includes the medical and health measures taken from the time of conception to birth, the purpose of which is to protect the mother and fetus's health (25). Despite the recent advancements in various medical fields, some pregnant women do not seek prenatal care. Therefore, this study was conducted to identify the reasons for prenatal visits.

It was found that among the pregnant women, 72.1% had regular visits and 27.9% had irregular ones. Using univariate logistic regression, we found knowledge and self-efficacy as effective variables on prenatal visits. Using multifactorial logistic regression, we also found knowledge as an effective variable. There were significant correlations among the structures of health belief model such as knowledge and perceived severity, as well as perceived benefits and self-efficacy. In addition, there were significant correlations between perceived severity and perceived benefit and between cues to action and self-efficacy. Furthermore, there were significant correlations between perceived benefits and cues to action and self-efficacy. Finally, we found a significant correlation between cues to action and self-efficacy.

We observed that 72.1% of the women had regular visits for receiving prenatal care and 27.9% had irregular visits. Considering the importance of pregnant women and their fetus's well-being, the percentage of irregular visits, which was one-thirds of the total visits, was not

favorable that can have adverse effects. Eshraghian et al. (2006) found that half of the pregnant women had adequate number visits (26). In another study by Khanjari et al. (2006), the results showed that despite providing health care services for pregnant women, 83% of women received moderate or inadequate prenatal care services (27). Ayoola et al. (2010) revealed that 20% of participants did not seek prenatal care services in the first trimester of pregnancy (28). Heaman et al. (2008) showed that the relationship of inappropriate prenatal care with premature birth and low birth weight was significant (29).

Knowledge was one of the effective factors on timely prenatal visits among the pregnant women who participated in the study. Therefore, increased knowledge about care and the number visits was effective in performing regular visits. The results of a study by Paredes et al. (2005) demonstrated that knowledge about the importance of prenatal care in poor women was less compared to those from other economic strata of the society. Knowledge of women who received prenatal care was higher in comparison with those who had inadequate prenatal visits (30). Furthermore, in a study carried out by Hajizadeh et al. (2016), the results revealed the effect of regular visits on pregnant women (31). Khanjari et al. (2006) also proposed lack of information regarding the necessary prenatal visits as a barrier to performing prenatal care in pregnant women visiting health centers (27). In addition, in this study, the mean score of knowledge in women with regular visits was higher compared to women with irregular visits. The influence of knowledge on regular visits was

significant, but the odds ratio was 0.929, which given the proximity of this value to number one was not a big effect.

Self-efficacy was one of the effective factors on prenatal visits. Higher levels of self-efficacy led to more timely visits. In a study by Jahdi et al. (2014), it was found that women's abilities are effective in doing prenatal care (32). The results of this study were in accordance with those of Stang et al. (2010) and Chang et al. (2008) (33, 34). Therefore, to increase timely prenatal visits, some approaches such as retraining health personnel for the follow up of pregnant women can be used. It is also helpful to plan and design training and intervention programs based on the target group characteristics. Considering the level of pregnant mothers' abilities, skills, and health, health care providers can choose the best interventional approaches to improve the health level of pregnant women and the number of regular visits during the prenatal period.

We presented the findings of the studies carried out in Iran on prenatal visits using the health belief model. Our findings can help promote the knowledge about effective factors on timely prenatal visits, which was found to be very limited. The limitations of this study include completing the questionnaire using self-report and not considering unwanted pregnancies.

## Conclusion

Based on the results of this study, prenatal care and regular visits are necessary for pregnant women considering their physiologic and anatomic conditions. It seems that interventional and preventive programs should be implemented to investigate the causes of irregular prenatal visits, and appropriate interventions should be designed and implemented based on the effective factors to prevent irreparable, unwanted consequences for pregnant women. Furthermore, environmental, cultural, and economic factors in prenatal care and timely visiting should be considered. Finally, the results of this study can provide solutions in the field of prenatal care for planners and health officials to implement effective programs.

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## Conflicts of interest

The authors declare no conflicts of interest.

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