**Advances
in
Bioresearch**

ORIGINAL ARTICLE

Determinants of Intention to Use Prenatal Care Services among Rural Women in Iran

Fatemeh Imani[1], Sepideh Hajian[2], Hedyeh Riazi[2], Fatemeh Salmani[3]
1-Student's Research Office, Faculty of Nursing & Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2- Department of Midwifery & Reproductive health, Faculty of Nursing & Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3- Department of Biostatistics, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences,Tehran, Iran.
E- mail: s.hajian@sbmu.ac.ir

ABSTRACT

Complications arising during pregnancy and the consequent demise of the mother has been, and still is, one of the public health concerns. A high number of these deaths are not due to an underlying disease but occur during pregnancy or after a seemingly natural process of childbirth; yet these tragic incidents can be prevented by using prenatal care services. The aim of this study is to examine the determinants of intention to use prenatal care services, employing a health promotion theoretically framework, Extended Parallel Process Model's (EPPM) constructs, as predictors and for the first time in this subject matter. Using EPPM, this cross-sectional study aims to analyze and discuss the determinants of intention to use prenatal care services; the case study includes 400 pregnant women who have a medical record in healthcare facilities or rural health houses in all of suburbs of Qeshm Island, Iran. The initial examination of the resulted scores for perceived efficacy and perceived threat indicated that the average score for the intention to use prenatal care was lower in women who were in fear control stage than in women who were in threat control stage. The strongest variables of EPPM in predicting the intention to use prenatal care services were, respectively: positive attitude to use prenatal care services, perceived self-efficacy, perceived susceptibility, and perceived severity. The linear regression analysis showed that having a male child, a history of infertility and the smallness of the family size are factors that contribute to a higher average score of behavioral intention, while the illiteracy of the pregnant woman and the husband's occupation as a laborer contribute to a lower average score.The current model provides a useful framework for examining the factors relating to health behaviors in people. The midwifery service providers should identify and recognize the pregnant women's cultural beliefs about the prenatal cares and should endeavor to remove their mental barriers and to correct and amend their beliefs so as to enhance their self-efficacy for using prenatal care services.
Key Words: prenatal care, rural women, Extended Parallel Process Model, Iran

How to cite this article:
F Imani, S Hajian, H Riazi, F Salmani. Determinants of Intention to Use Prenatal Care Services among Rural Women in Iran. Adv. Biores., Vol 8 [1] January 2017: 216-226**.**

INTRODUCTION

Prenatal cares include information and instructions given to a pregnant woman from the start of her pregnancy until the childbirth, with which she is able to protect herself and her family [1]. These cares consist of a coordinated approach that takes into account medical attentions and social-psychological supports which, in optimum circumstances, starts before the time of pregnancy and lasts throughout pregnancy until the childbirth [2]. Regular prenatal care prevents the complications of pregnancy and childbirth and lowers the risk factors by using instructions, therapy and social support [3, 4].
Despite the extended supports and struggles for having a safe motherhood as part of the Millennium Development Goals, complications arising during pregnancy and the consequent demise of the mother is still a serious concern in public health field which primarily threatens the life of women living in developing countries [5]. Everyday almost 800 women lose their life due to reasons related to pregnancy

and childbirth; many of these deaths occur in areas that have difficulties in receiving healthcare services, and almost 99% of these deaths occur in developing countries [6]. Although most pregnancy and childbirth deaths can be prevented, the poor condition of women in such societies, coupled with their low level of literacy and education, prevents them from benefiting prenatal and childbirth care services despite the fact that these services might be available for them. While inaccessibility to educated and instructed midwives during pregnancy and childbirth has been proved to have a direct relation to the death of the mother, most childbirths in such areas are done in the house and without an educated midwife available [7].

Lowering the rate of maternal deaths and enhancement of women's health has been one of the aims of Millennium Development Goals, and Iran has been successful in achieving this goal, since in 2012 the rate of maternal deaths has been decreased to 23 cases in every 100,000 live childbirths and this shows a great improvement in providing prenatal and midwifery services [6]. Working through a coordinated network, the Iranian Health Organization provides services to the public on three levels: the first level includes rural health facilities, rural and urban health centers, and health bases; the second level comprises of health centers and city hospitals that provide professional services; and the third level includes centers that provide specialized services. In Iran, public health centers, along with private ones, dispense various health and medical services, yet the state sector, especially the Ministry of Health and Medical Education, has a larger and more significant role to play in matters of public health. The most significant features of health centers are their geographical accessibility and the cultural compatibility of the service providers with the patients, and their most significant role is to provide the preventive services of the first level including family health services (prenatal and postnatal services, contraceptive services etc.) which are given by the local and professional social workers who are actively involved (e.g. by following up on why a patient has quitted visiting the center or is late in doing so) in the process when necessary. Each health center covers approximately 500 to 2000 people. The centers register and keep the gathered information of each person and household, and report them periodically. Despite the fact that these services are free, and also that more than 90% of prenatal care services have been given by professional midwives in primary healthcare centers and by social workers in rural health facilities in the last two decades, 17% of cause-specific maternal mortality in 2010 has been due to the lack of, or inadequate or late prenatal care services. The most common reason reported for this matter was the pregnant mother and her family's inadequate understanding of using cares during pregnancy (39%), during childbirth (8%), and after childbirth (8%) [8]. Pregnant women's refusal to visit health centers for receiving prenatal cares in some of the rural, deprived and under-developed areas has been known to be one of the most significant, but preventable, reasons for the increase in the maternal death rate in the last few years in Iran. Between the years 2010 to 2015, among the least developed provinces of Iran, Hormozgan (located in the south of Iran) had one of the highest rates of maternal mortality in the country with the average of 39.7 deaths in every 100,000 cases [9], and the Qeshm Island (located in the south of this province) had –despite the 70.97% coverage of prenatal care –the highest rate in 2012 with 62.22 deaths in every 100,000 cases. Lack or inadequacy of receiving prenatal care services, along with the pregnant women's late decision to get help, have been identified as the most important reasons for these tragic, yet preventable, incidents [10].

The limited studies done in this regard in Iran show that various reasons, such as the pregnant women's feeling that they do not need to receive care and their distrust of the providers of care, result in inadequate or late prenatal cares. But the studies also show that high level of education and literacy in woman and the presence of an encouraging person to receive care in time of pregnancy can be facilitators to send her to visit health center for mother and developing child [9]. Regarding the high rate of maternal mortality in the province of Hormozgan, it was necessary to identify the prohibitive as well as facilitating factors for receiving prenatal cares, employing a scientific approach. One of the most appropriate models for examining health-related behaviors in people is Extended Parallel Process Model. Developed originally by Witte, this model is based on fear appeal [11]. According to this model(figure 1), people, when faced with a piece of health-related message, evaluate its benefits and disadvantages and make a response accordingly; that is, they make either a threat appraisal or efficacy appraisal, while each appraisal generates three different responses: people either show indifference towards the message, reject it, or accept it. In other words, if the person does not feel threatened by the potential dangers of an unhealthy behavior, or does not feel that the danger is of any significant severity or seriousness (i.e. inadequate understanding of the severity of the danger), then s/he will be indifferent towards the solutions and care strategies for that danger, and therefore there will be no change in her/his perception, nor any intention to change the unhealthy behavior. On the other hand, should the danger be taken into serious consideration, the result will be called efficacy appraisal. In such a condition, if the person feels

threatened by the unhealthy behavior, s/he will endeavor to control the threat (threat control) by trying to find efficient and accessible strategies for that potential danger and also by understanding his/her own self-efficacy. Or reversely, although they may be aware of the severity and seriousness of the danger, they may still try to deny the existence of the threat or its severity (fear control). Witte's approach assumes that if the perceived efficacy, which itself branches into self-efficacy and response-efficacy, is higher than the perceived threat in a person, then the possibility of correcting the unhealthy behavior and the intention to adopt a healthier one becomes stronger. Conversely, if the perceived threat is stronger in the person that the perceived efficacy, it lessens the possibility of adopting a healthy behavior. What distinguishes this model from other fear-appeal-based models is the way it determines the critical point by subtracting the perceived threat score from the perceived efficacy score. If the resulting figure is zero or below zero, the person is in the fear control stage, and if the figure is above zero the person is in the threat control stage [12]. But what should be eventually evaluated is the person's intention to adopt a healthy behavior. What is meant here by "behavior" includes the perception, personal beliefs and the subjective norms of a person which influences his/her power of controlling a behavior and which in effect has an impact on that person's intention to change a behavior. Since a person's clear articulation of their intention to do something is the strongest predictor of her/his behavior [13], this study aimed to examine the factors contributing to such articulations, employing Witte's model to discuss the most important determinants for receiving or not receiving prenatal care services among rural women community. Specifically, a theoretical model was used in the current study to explain behavioral intention among Iranian rural women. The following questions guided the focus of this research: (1) what components of EPPM are significant predictors of behavioral intention to receive prenatal cares among the Iranian rural women in Qeshm Island? (2) Will the pregnant women with positive attitude also more intended to receive prenatal care services in health facility or rural health house? (3) What other non –personal factors play as barriers to prenatal care utilization in this area? Therefore, an exploratory research was accomplished to respond these questions.

MATERIAL AND METHODS
Research design setting
This cross-sectional study has been done in 2015 in Qeshm Island, situated in the Persian Gulf in the province of Hormozgan, which has a surface area of 1491 square kilometers and a rural population of 87000 people (total population of Qeshm: 113000 people). Like most cities in Iran, the spatial dispersion of the rural suburbs of Qeshm has multiple distribution and therefore several satellite villages has been assigned to each healthcare facility or rural health house, and health services are given to each village by a specific healthcare facility/rural health house. Thus the research design setting covers all the 45 rural suburbs of Qeshm, while the statistical population of the study includes the pregnant women who had a medical record in healthcare facilities of Qeshm Island, affiliated with Hormozgan University of Medical Sciences.
Sampling Methods
First, a list was made of all the healthcare facilities in Qeshm, and then based on the population of the pregnant women who had health records in each healthcare facility/rural health house the participants were chosen first through quota sampling and second through simple random sampling to recruit eligible pregnant women for the study. It should be noted that since there were only few pregnant women in some of the healthcare facilities who were being medically covered, they were chosen for the study through census sampling. Inclusion criteria were: having an Iranian nationality, having residence in one of the rural suburbs of Qeshm, and being in the first half of pregnancy. The population of women who had health records were 1100 in total but through the aforementioned sampling methods, and following the formula *effect size = 0.14*, *random error < 0.05*, and *power of study = 80%*, the sample size was reduced to 400 women.
Measurement tool
Data gathering was done through the "Risk Behavior Diagnosis Scale"(RBDS), a structured questionnaire following the Extended Parallel Process Model. The statements were modified and edited by taking into account the previously-published literature, the pilot study, and interviews with 30 pregnant women living in rural areas conducted by the current authors. The scale had two main structures, namely perceived threat and perceived efficacy, while each structure had two sub-scales of their own: perceived severity and perceived susceptibility, and perceived response-efficacy and perceived self-efficacy, respectively [12]. Thus the tool of this study had six conceptual statements for the sub-scales perceived severity, perceived susceptibility, perceived response-efficacy and perceived self-efficacy. The perceived severity was evaluated by statements that appraised the dangers of delayed visits to healthcare

facilities/rural health house for receiving prenatal cares and its effects on the health of the mother and the developing fetus. The statements concerning the perceived susceptibility evaluated the mother's conceptual understanding of the sensitivity and the threats that the mother and the baby are exposed to against undiagnosed complications during pregnancy and childbirth if they are not visiting a health center or receiving regular prenatal cares. The statements about the perceived response-efficacy concerned statements about the pregnant woman's understanding of the efficacy and the benefits of prenatal care services, while the perceived self-efficacy statements evaluated the pregnant woman's understanding of her own abilities to regularly and punctually visit health centers for receiving prenatal cares. In addition, fourteen more questions were asked to assess women's perception of prenatal care services which were then evaluated and graded using Likert scale. Furthermore, in order to examine the role and the significance that each of these constructs have in women's intention to receive prenatal care, four statements were added to evaluate women's behavioral intention for receiving these cares, drawing on concepts found in Ajzen's theory of behavioral intention and other similar texts [13]. These statements evaluated the pregnant woman's intention to regularly and punctually visit a healthcare facility to receive prenatal cares in her current pregnant state. The grading of each statement was done using a 5-point Likert scale, measuring each statement for every subscale from 1 to 5 (from totally disagreed to totally agreed). Finally, since the mental barriers that stop a person from adopting a healthy behavior are due to many various inhibitors, a final question was asked in a semi-structured manner at the end of the questionnaire to evaluate other non-personal reasons for not receiving efficient prenatal care, with six alternative answers as: long distance from home to the health center, not owning a personal vehicle for going to a health center, having to watch over minor children or elderly people, husband's disagreement to visit a health provider, and other reasons. The validity of the tool of the study was confirmed by face and content validity methods. The face validity was assessed by handing out questionnaires to 10 midwifery, reproductive health and health promotion experts, who evaluated the aforementioned statements with regards to their possible ambiguity, difficulty, whether or not they're using a common language (that is, whether they're utilizing unfamiliar and specialized terminology), as well as whether the size of the initial questionnaire is congruent with the aims of the study. In addition, the tool was evaluated by making a pilot test with 20 random selected eligible pregnant women to re-check whether the statements are possibly ambiguous or insufficient; in effect, some of the questions were modified [14]. In the next stage, in order to determine the content validity index by using Walts and Bussel's criteria and following the minimum acceptable score for content-related validity based on Lawshe's chart [15], the tool of the study was given to 12 experts on the topic and methodology. The Content Validity Index (CVI) and Content Validity Ratio (CVR) for each of the sub-scale in the questionnaire were, respectively, as follows: perceived susceptibility (0.91 and 0.86), perceived severity (0.96 and 0.94), perceived response-efficacy (0.98 and 0.97), perceived self-efficacy (0.95 and 0.77), and behavioral intention (0.89 and 0.83). Therefore the overall average score of study's tool CVI was 0.94, and the average CVR was 0.87.

Finally, the reliability of the study's tool was examined using test-re-test method by giving the test to 10 random selected eligible pregnant women for the study after a two-week interval. The correlation coefficient of the statements of the tool was 0.87 and Cronbach's alpha coefficient of the tool was 0.93, which showed that the tool had a good consistency [16].

Data gathering

After obtaining consent forms from all the participants, the questionnaires were filled in the self-completion manner. Sampling and data gathering were done continuously from February to April 2015. In case a participant was illiterate, the questionnaire would be filled by the author interviewing the participant. Furthermore, the author would meet those participants who were unwilling to answer the questionnaire in a healthcare facility/rural health house at their own home. Since determining the critical point is of a very significant importance in so far as it acts a predictor to reveal whether a person is in the threat or fear control stage, and that it shows in very simple terms whether a person intends to possibly change an unhealthy behavior or not, the score for the perceived threat (which was the total sum of sub-scales perceived susceptibility and perceived severity) was deducted from the score for perceived efficacy(which was the total sum of sub-scales self-efficacy and response-efficacy) and at the end critical point for each test-taker was calculated.

Data analysis. Two-independent samples t-test, univariate one way ANOVA and multiple and stepwise linear regression were conducted to determine the model's constructs that predict behavioral intention to receive prenatal care among the sampled pregnant women. For all the analyses, the computer program SPSS version 21 was used.

Ethical considerations

The ethical considerations of present study were approved by the deputy of research (Ethical Cod: sbmu2.rec.1394.22). Participant were reassured about confidentiality of their responses and informed that they could discontinue the questionnaire completion or interview at any time they intended and it did not affected their routine care. All the interviews were performed in a private atmosphere to provide more convenience for participants. In case of diagnosis of any maternal / perinatal risk or disorder, depending to the condition and according to Iranian prenatal care protocol, participants were referred to the higher level of maternal care.

RESULTS
Descriptive data
The sample of the study consisted of 400 women who were being in their first half of their pregnancy and who had completed a consent form to fill the questionnaires. Most of the participants of the study were 25 to 30 years old (44.8%). The average pregnancy age of the sampled population was 11/91±2.7. The degree of education of more than half of the population was below a high school diploma (63.8%). Also, the majority of the participants were housewives (93.2%). More than half of the participants had a natural childbirth before (55%) and at least one child (73.7%) (Table 1).

The two-independent samples t-test showed a significant statistical difference in perceived self-efficacy and perceived susceptibility between those women who didn't have a childbirth before and those who had more than one childbirth: both variables were higher in women who hadn't experienced childbirth before (24.55±5.04 and 23.5±4.09, respectively) than in women who had experienced childbirth (23.02±5.85 and 22.16±5.35). Furthermore, there was a significant difference in the score for behavioral intention between pregnant women with a history of any type medical problem or illness and those without: the score for pregnant women who had mentioned a history of a medical problem or illness was lower than those who hadn't mentioned any such problems (t = -2.86, 95% confidence interval [CI] = -2.01- -.4, p=0.004).

Furthermore, the results of univariate one way ANOVA test showed that there is a significant statistical difference in perceived response-efficacy score between women of age 18-24 years old and those who had less than 18 years old (p=.008), those who were between 25-30 years old (p=.02), and those above 30 years old (p=.02), so that the average score for these variables in women between 18-24 years old was lower than the rest of the age groups. Similarly, there was a significant difference in perceived severity score between women who were 18-24 years old and those less than 18 years old (p=.007), those who were between 25-30 years old (p=.000), and those who had above 30 years old (p=.03), so that the average score for the first age group was lower than the rest.

In addition, there was a significant statistical difference in scores for perceived self-efficacy, perceived response-efficacy, perceived susceptibility and attitude between illiterate women and those who had elementary education degree (p=.007), those with secondary education degree (p=.000), and those with a high school diploma or higher (p=.03), so that the average score for the first group was lower than the rest of the groups.

Predictors of behavioral intention
The first questions of this study sought to determine significant predictors, as well as assess the influence of the model's components on behavioral intention to receive prenatal care among Iranian rural pregnant women. To answer this question, at first, the sum of efficacy items and the sum of threat items were calculated. Then threat total score was subtracted from efficacy score and then critical point was obtained accordingly to determine the discrimination value: 98 women (24.8%) had a critical point below zero, and 302 women (75.5%) had a critical point of zero or above. The results for two-independent samples t-test demonstrated that there was a significant statistical difference in the average score for the intention to receive prenatal cares between those pregnant women who were in fear control stage (those with critical points below zero) and those in threat control stage (those with zero or above zero critical points), so that the average score for behavioral intention variable in the former group (12.66±1.29) was lower than the latter (18.61±1.52). This finding suggested that the higher score of perceived threat and lower perceived efficacy, predicted lower odds of intention to use prenatal care services. The average scores, standard deviations, range, as well as the scores related to the variables of the model for determining the critical point and distinguishing whether the women were in fear or threat control stage are presented in Table 2.

The overall results showed that there was a significant correlation between the intention to use prenatal cares and the components of the model (Table 3).The results of linear regression analysis demonstrated that there was a significant statistical difference between the number of family members and the score for the intention to receive prenatal care, so that with the increase of family members and consequently,

family size the average behavioral intention score decreased by 0.23 unit. Furthermore, the average score of this variable in women who had a husband working as laborer decreased by 0.17 unit, but with the increase of the number of male children in each household the average score increased by 0.16 unit. However similar results weren't found for the variables of previous childbirth method(s), history of prolonged and difficult childbirth and the pregnancy age.

In addition, to identify weight and influence of the model's components on behavioral intention, the EPPM constructs were entered a multiple regression model. Stepwise multiple regression generated significant predictors of behavioral intention from a set of EPPM predictors. The results demonstrated that all model's constructs (perceived self-efficacy, perceived response-efficacy, perceived susceptibility and perceived severity)were significant predictors of behavioral intention, and perceived self-efficacy was the strongest predictors among others. For each single unit increase in the score of perceived self-efficacy, the average behavioral intention score was increased by 0.52 unit. The beta weight for each model's construct indicates the type of relationship that exists between the variables and behavioral intention. Table 4 of the model 1 stepwise suggested that there was a negative linear relationship between the perceived susceptibility and perceived severity and women's behavioral intention score (B= -0.367, p= P=001; B= - 0.153, p<0.001, respectively).

The second question sought to identify whether the pregnant women with positive attitude were more intended to receive prenatal care services. So, in the next step, attitude was added to the other components of the model in the linear multiple regression analysis. Result showed that only attitude and perceived self-efficacy were positively related with the intention to use prenatal cares, as with each single unit increase in the score of attitude and self-efficacy, the average behavioral intention score was increased by 0.56 and 0.539 unit, while conversely with each single unite increase in perceived susceptibility and perceived severity the average behavioral intention score was decreased by 0.18 and 0.15 unit, respectively. In model 2, the only variable that didn't predict the intention to use prenatal cares was perceived response-efficacy (Table 5).

Finally, to answer the third question, according to the participants'response to the questionnaire, other non-personal barriers for receiving prenatal cares were determined, which are as follows: long distance [the distance from the woman's home to the nearest health facility/rural health house] (21.8%), not owning a personal vehicle for visiting a health care provider(8.3%), having to watch over a minor child or an elderly person at home (7%), and other reasons (5.3%) such as insufficient consideration for the personal needs, and the pregnant woman's cultural beliefs by the health care providers in prenatal care services. However, no significant correlation was found between the distance of home to the nearest health facility/ rural health house and the behavioral intention score.

DISCUSSION

The current study examined the intention to use prenatal care services by pregnant women living in rural areas, using Extended Parallel Process Model. The results showed that women who were in fear control stage had a lower average behavioral intention score than those who were in threat control stage. In addition, the strongest structures of the model for predicting the intention to use prenatal care services were, respectively, positive attitude, perceived self-efficacy, perceived severity and perceived susceptibility. This study showed that perceived self-efficacy was higher in women who hadn't had a childbirth before than women who had. This result contradicts the research previously done by Hajian *et al* [17] where they discussed that perceived self-efficacy in women who has had a childbirth before is higher than women who has not.

The current study also showed that having a history of medical problem(s) or internal illness in pregnancy had a direct correlation with the lower behavioral intention to use prenatal care services, and this results is congruent with the research done by Boerleider *et al* [18] where they point to the same conclusion. Another result of this study was that the perceived susceptibility score was lower in illiterate women than the other groups, which is compatible with findings of Hajian *et al* [17]. Researchers have shown that the literacy and education of pregnant women is the most important predictor for benefiting from the prenatal care services for the mother and the child. In addition, the correlation between women's education and using healthcare services in developing countries has been well discussed [19]. A person with an adequate level of education is able to be responsible for the health of their own self and their family members [20]. An inadequate level of education corresponds to weak, unhealthy behaviors, and less concerns for health-related behaviors and issues. It is also argued that people who show weak skills in health-related issues are not adequately aware of health problems and have a weaker physical and mental health [21].

There was a significant statistical difference between the number of the members of a family and using prenatal care services, and this finding is compatible with the research done by Khanjari *et al* in [22] which sets out to determine the methods of receiving prenatal cares and factors that have effects on them. Their research discusses that larger families receive inadequate cares due to lack of any trusting person to watch over the minor children.

This study also showed that a higher perceived efficacy is followed by a stronger intention to change an unhealthy behavior, and that when perceived efficacy is high it brings about a higher understanding of the threat and therefore a higher chance of changing into a healthy behavior; this finding is congruent with other researches done in the same vein [23-25]. The current research is also compatible with the study done by Errett *et al* in 2013 [26] which shows that a higher self-efficacy is followed by more optimal and desired outcomes, however, response-efficacy in the current study did not predict behavioral intention for using prenatal cares when entered the model 2 linear regression analysis. The results found in the study by Hajian et al that the perceived self-efficacy, severity and response-efficacy has a bearing on determining the score of behavioral intention, while perceived susceptibly does not, contradicts the results found in the current study [17]. This study also confirmed the classic theory of EPPM which indicates that the increase in the scores of perceived severity and susceptibility is followed by a decrease in the behavioral intention score. In other words, the increase in the scores of perceived severity and susceptibility shows that the women living in these rural suburbs, although feeling threatened, refuse visiting health facilities/rural health house to receive necessary cares since due to the aforementioned barriers receiving prenatal cares might lead to diagnosis of certain pregnancy diseases which in turn might force the mother to do a premature birth and/or a Caesarean operation. In this regard, the score for perceived severity was lower than other sub-scales, which shows that the potential threats resulting from lack of using prenatal care services and the dangers threating the health of the mother and the fetus have been less understood by very few pregnant women; while researches show that regular prenatal cares lessen the complications of pregnancy and childbirth –using instruction, treatment and social supports (3, 4). On the other hand, being diagnosed with a serious complication during pregnancy when receiving prenatal cares, being referred to higher levels of health services, having to do premature childbirth or a Caesarean operation had a key role in weakening the intention to use prenatal care services by some pregnant women in the current study. Furthermore, since the promotion of pregnant women's attitude and their immediate family and relations (especially their husbands) about prenatal cares is of high importance in predicting the behavioral intention, the providers of midwifery services should note the significant impact that the external stimuli have on the women's behavior and the way these external stimuli can form women's subjective norms [27, 28]. Thus, utilizing available media and/or the participation of pregnant women and their husbands or a member of their family in instructing classes during pregnancy can promote their vision about prenatal care services and increases the possibility of receiving, and cooperating with the providers of, such cares –since the studies done in this regard show the presence of a person encouraging women to visit health centers for mothers and developing fetus can have a great impact [9, 29]. The participants had mentioned the long distance and lack of any personal vehicle as the main reasons for not visiting a health center to receive prenatal cares, although no significant correlation was found between the long distance factor and the score of behavioral intention. This result might be justified by considering the long distance as a mental barrier for women; the fact that these areas have a hot and humid weather has made the distance unrealistically long to them. Because of the climate, most men living in these suburbs are usually awake until after midnight to be able to do their work (fishing etc.), and in consequence they sleep and rest until noon in the days and thus are not able to take their wives to a health facilities or to take care of their minor children at home. This causes women to only have time for visiting a health care provider at health facility / health house at noon, by which time the work time in these centers would be nearly over, and which in turn poses a problem for rural women for receiving prenatal care services. This study therefore suggests that considerations should be made by these local health centers in their programs to remove these obstacles. One helpful approach can be the social workers'visits to the homes of these pregnant women, since these local social worker have cultural compatibility with the receivers of the cares and this can result in better effects. Another solution can be giving serious considerations to and providing culture-sensitive services, on specialized levels, to mothers who need special treatment cares, since this is one of the main concerns and barriers for these women to receive prenatal cares [30, 31].

This study, like most other descriptive ones, had limitations that should be mentioned here. Firstly, due to the illiteracy of a large number of the test-takers, many of the questionnaires had to be filled by through interviews conducted by the first author of this research, whose knowledge of the local language and dialect of the area and the fact that she reassured the women and explained to them the importance of

answering the statements in the questionnaire, kept the accuracy and veracity of the given answers much intact. Secondly, this study took into account only those pregnant women who had a family medical record in one of the health facilities or rural health houses of Qeshm, therefore it was not possible to account for all the other pregnant women in this area who didn't have a medical record in one of these centers; this was inevitable since it was necessary to keep the rights and consent of the participants before taking them for this study. Finally, the present study has not identified total coverage of all factors responsible for or that may play as key roles in prenatal utilization among rural pregnant women. Other factors such as cultural barriers and or facilitators should therefore be given more attention in this community.

Table 1- participants' characteristics

characteristics	N(%)
Age	
>18	41(10.2)
18-24	133(33.2)
25-30	179(44.8)
>30	47(11.8)
Educational level	
No education	23(5.8)
<6 years	232(57.9)
≥6 years	117(29.3)
≥12 years	28(7)
Employment status	
Housewife	373(93.2)
Official employee	3(0.8)
Self-employed	24(6)
Husband's education	
no education	13(3.3)
<6 years	152(38)
≥6 years	190(47.5)
≥12 years	45(11.2)
Husband's employment status	
Official employed	37(9.2)
self-employed	17(4.3)
Manual skilled	240(60)
semi-manual skilled(laborer)	106(26. 5)
Number of pregnancy	
0	106(26.3)
≥1	294(73.7)
Method of childbirth	
Normal Delivery	220(55)
Caesarean Section	65(16.3)
None of them	115(28.7)
Salary*	
insufficient for daily affairs	112(28)
Affordable for daily affairs	242(60.5)
More than affordable	46(11.5)
diagnosed Past Medical problem	
Yes	58(2.8)
No	(97.2)
diagnosed current Medical problem	
Yes	68(17)
No	332(83)

Table 2.Range, Mean, and Standard Deviation of Subscales Scores on the Risk Behavior Diagnosis Scales Based on the Extended Parallel Model

Variables	Number of item	Item range (minimum-maximum)	Range of scores	M±SD
Perceived Susceptibility	6	6-30	12-30	22.53±5.258
Perceived Severity	6	6-30	14-30	24.32±4.222
Perceived Response- efficacy	6	6-30	13-30	25.72±4.399
Perceived Self- efficacy	6	6-30	11-30	23.43±5.678
Attitude	14	14-70	34-70	58.15±10.92
Behavioral Intention	4	4-20	10-20	17.16±2.95

Table 3.correlation between the model's constructs in regard to the behavioral intention to receive prenatal cares

| Variables	Perceived Susceptibility	Perceived Severity	Perceived Response-efficacy	Perceived Self-efficacy	Attitude	Behavioral Intention
Perceived Susceptibility	–	r =.665 p< 0.001	r = .774 p<0.001	r =.849 p<0.001	r =.640 p<0.001	r =.590 p<0.001
Perceived Severity	–	–	r = .746 p < 0.001	r = .717 p < 0.001	r = .590 p < 0.001	r = .500 p < 0.001
Perceived Response-efficacy	–	–	–	r = .749 p < 0.001	r = .739 p < 0.001	r = .635 p < 0.001
Perceived Self-efficacy	–	–	–	–	r =.784 p < 0.001	r = .770 p < 0.001
Attitude	–	–	–	–	–	r = .832 p < 0.001
Behavioral Intention	–	–	–	–	–	–

Table4. Summary of Linear Regression Analysis Predicting behavioral Intention for Prenatal Care based on the EPPM constructs

Predictor	Beta(standardized coefficient)	95% confidence intervals	P	SE
Perceived Susceptibility	-0.367	-0.274 to -0.138	P=0.001	0.034
Perceived Severity	-0.239	-0.235 to -0.100	P=0.001	0.034
Perceived Response-efficacy	0.373	0.177 to 0.324	P=0.001	0.037
Perceived Self-efficacy	0.973	0.443 to 0.568	P=0.001	0.032

Table5. Summary of Linear Regression Analysis Predicting behavioral Intention for Prenatal Care based on the questionnaire's main variables

Predictor	Beta(standardized coefficient)	95%confidence intervals	p	SE
Perceived Susceptibility	- 0.185	-0.164 to -0.043	P=0.001	0.031
Perceived Severity	- 0.153	-0.165 to -0.048	P<0.001	0.030
Perceived Response -efficacy	0.078	-0.018 to 0.123	0.147	0.036
perceived Self-efficacy	0.539	0.215 to 0.345	P<0.001	0.033
Attitude	0.560	0.126 to 0.176	P<0.001	0.013

Figure1. Simple Description of Witte's Extended Parallel Process Model for fear appeals (according to Witte, 2001)
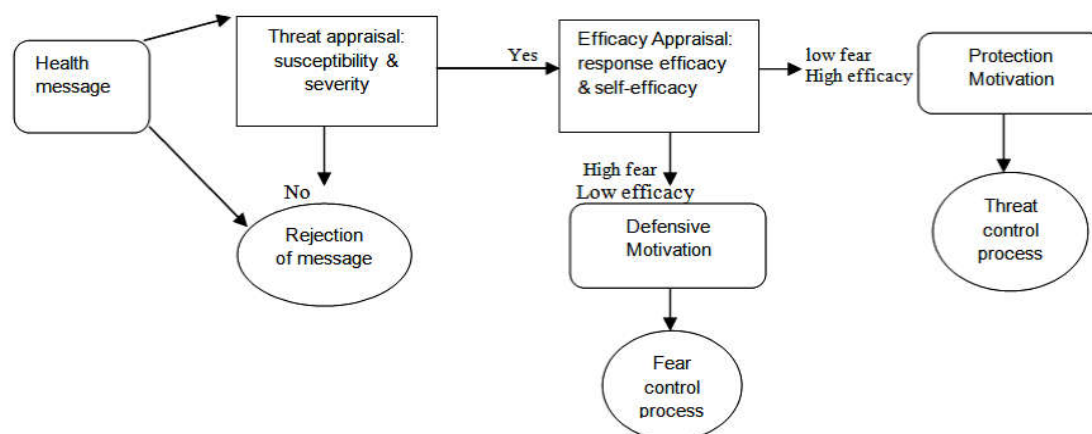
ACKNOWLEDGMENTS

CONFLICT OF INTEREST:
The authors declare no conflict of interest.

AUTHORS' CONTRIBUTIONS
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

REFERENCES
1. Cooper, M.A., Fraser,D., (2009).Myles Text Book For Midwives.,15th ed.London,CHURCHILL LIVINGSTONE
2. Cunningham, F.G.,and et al., (2009).Williams Obstetrics.Vol.1, 23thed. New York, Mc GRAW HILL.
3. Debiec, K.E., Paul, K.J., Mitchell, C.M. and Hitti, J.E,. (2010). Inadequate prenatal care and risk of preterm delivery among adolescents: a retrospective study over 10years.Am J Obstet Gynecol, 203(122): 1-6.
4. Chiavarini, M., Lanari,D., Minelli, L. and Salmasi,L., (2014). Socio-demographic determinants and access to prenatal care in Italy. BMC Health Services Research14: 174.
5. Hagey, J.,Rulisa, S. and Perez-Escamilla, R. (2014). Barriers and solutions for timely initiation of antenatal care in Kigali, Rwanda Health facility professionals' perspective". Midwifery 30, PP:96–102.
6. World Health Organization. (2014). Maternal Mortality. Available at: www.who.int/entity/mediacentre /factsheets/fs348/en/ 37k.
7. Park, k., 2009.Park's textbook of preventive and social medicine.21th edition banarsidas Bhanot Publishers.
8. Ministry of Health & Medical Education. Family & Population Office Maternal Health Unit. Report of performance and achievement of the nation maternal mortality surveillance system. 2010. [Full text in Persian].
9. Rajaee, M., Zara, Sh., Dadipour, S., Fallahi, S., Rajaee, F., Pourahmad, F., Mobarakabadi, A. *&* Moradi, S. (2014)."Determining the Frequency and CausesofMaternal Mortality in Hormozgan Province, Iran during 2005-2011"The Iranian Journal of Obstetrics, Gynecology and Infertility, 16(87):9-14.
10. Hormozgan University of Medical Sciences, Family health Unit. Research center of Hormozgan Province, Maternal Mortality Rate Report. (2012)[Full text in Persian].
11. Witte, K. (1995). Fear as Motivator, Inhibitor: *Using Parallel Process Explain Fear Appeal Fear as the Extended Model to Successes and Failures.* East Lansing, Michigan: Academic Press.
12. Witte, K., Meyer, G., Martell, D. (2001). *Effective Health Risk Messages: A Step-By-Step Guide.* SAGE Publications, Inc.
13. Ajzen, I. (2011). The theory of planned behavior: Reactions and reflections. *Psychology & Health*, 26(9) :1113-1127.
14. Polit, D. F. & Beck, C. T. (2013).*Essentials of nursing research*, Lippincott Williams & Wilkins
15. Lawshe, C. H. (1975). A quantitative approach to content validity.*Personnel psychology*, 28, 563-575.
16. Burns, N. & Grove, S. K.(2008).The *practice of nursing research: Appraisal, synthesis, and generation of evidence*, Saunders Publishers.

17. Hajian, S., Shariati, M., Najmabadi, K. M., Yunesian, M., & Ajami, M. I. (2015). Use of the Extended Parallel Process Model (EPPM) to Predict Iranian Women's Intention for Vaginal Delivery. *Journal of Transcultural Nursing*, *26*(3): 234-243.

18. Boerleider, A. W., Manniën, J., van Stenus, C. M., Wiegers, T. A., Feijen-de Jong, E. I., Spelten, E. R., & Devillé, W. L. (2015). Explanatory factors for first and second-generation non-western women's inadequate prenatal care utilisation: a prospective cohort study. *BMC pregnancy and childbirth*, *15*(1): 98.

19. Lam, Y., Broaddus, E. T., & Surkan, P. J. (2013). Literacy and healthcare-seeking among women with low educational attainment: analysis of cross-sectional data from the 2011 Nepal demographic and health survey. *International journal for equity in health*, *12*(1): 1-12.

20. Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC public health*, *12*(1):80.

21. [21].Peerson, A., & Saunders, M. (2009). Health literacy revisited: what do we mean and why does it matter?. *Health promotion international*, *24*(3):285-296.

22. Khanjari, S., Molla, F., Hosseini, F., & Faragollahi, M. (2006). Prenatal care utilization and factors affecting to receive prenatal care from clients' perspectives. *Iran Journal of Nursing*, *19*(45): 37-48.

23. Balicer, R. D., Barnett, D. J., Thompson, C. B., Hsu, E. B., Catlett, C. L., Watson, C. M. & Links, J. M. (2010). Characterizing hospital workers' willingness to report to duty in an influenza pandemic through threat-and efficacy-based assessment. *BMC Public Health*, *10*(1): 436.

24. Popova, L. (2014). Scaring the snus out of smokers: Testing effects of fear, threat, and efficacy on smokers' acceptance of novel smokeless tobacco products. *Health communication*, *29*(9):924-936.

25. Barnett, D. J., Balicer, R. D., Thompson, C. B., Storey, J. D., Omer, S. B., Semon, N. L.,& Norbin, J. A. (2009). Assessment of local public health workers' willingness to respond to pandemic influenza through application of the extended parallel process model. *PloS one*, *4*(7): 63-65.

26. Errett, N. A., Barnett, D. J., Thompson, C. B., Tosatto, R., Austin, B., Schaffzin, S., ... & Links, J. M. (2013). Assessment of medical reserve corps volunteers' emergency response willingness using a threat-and efficacy-based model. *Biosecurity and bioterrorism*: *biodefense strategy, practice, and science*, 11(1):29-40.

27. Leone, T., Padmadas, S. S., & Matthews, Z. (2008). Community factors affecting rising caesarean section rates in develop- ing countries: An analysis of six countries. Social Science & Medicine, 67, 1236-1246.

28. Mohammaditabar, S., Kiani, A., & Heidari, M. (2009). The survey on tendencies of primiparous women for selecting the mode of delivery. *Journal of Babol University of Medical Sciences*, 11(3):54-59.

29. Haddrill, R., Jones, G. L., Mitchell, C. A., & Anumba, D. O. (2014). Understanding delayed access to antenatal care: a qualitative interview study. *BMC pregnancy and childbirth*, *14*(1): 207.

30. Binder, P., Borné, Y., Johnsdotter, S., & Essén, B. (2012). Shared language is essential: communication in a multiethnic obstetric care setting. *Journal of health communication*, *17*(10): 1171-1186.

31. Moudi, Z., Saeedi, Z. A., & Tabatabaie, M. G. (2015). How Baloch Women Make Decisions About the Risks Associated With Different Childbirth Settings in Southeast Iran. *Nursing and midwifery studies*, *4*(1).