ORIGINAL ARTICLE

# Exploring the nutritional beliefs of pregnant women in Yazd city

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## Keywords

Pregnant women • Nutrition during pregnancy • Culture • Beliefs

## Summary

**Introduction.** *During the pregnancy, a woman as a healthy person grows another human being in her body and needs more cares due to changes in psychological and physical needs. This study aimed to explore the nutritional beliefs of pregnant women in Yazd city.*

**Methods.** *This was a qualitative study conducted with a conventional content analysis approach. A total of 12 participants were selected from women referred to the community health centers in Yazd, Iran, by the purposeful sampling method. Data were collected through recorded semi-structured interviews that were transcribed verbatim and analyzed by the Lundman and Granheim's content analysis method.*

**Results.** *In this study, after analyzing the data, 10 main categories and 26 subcategories were extracted. The codes were 446 cases with no overlap, which was reduced after careful review and integration of similar items. Topics of categories included: The concept of nutrition during pregnancy, Nutrition limitations during pregnancy, Myths about food during pregnancy, Doubts about nutrition during pregnancy, Pregnancy food style, Sources of nutritional information in pregnancy, Positive Consequences of Healthy Nutrition in Pregnancy, Consequences of inappropriate pregnancy nutrition, Religious Beliefs in Pregnancy Nutrition, social support.*

**Conclusion.** *The results indicated that the women were committed to their own nutritional beliefs that derive from their culture and this study provided a clear picture of the cultural beliefs of Yazdi women regarding pregnancy nutrition. According to the results, it is necessary to design the education process based on the culture of the community in order for that process to be effective.*

## Introduction

A woman, as a healthy person, nurtures another person in her womb during pregnancy and due to the psychological (anxiety and depression) as well as physical (weight gain and cardiac problems) changes which occur during pregnancy, she will be needing more care. Taking care of the woman's health directly affects the health of her unborn child [1, 2]. Maintaining the mother's health through prenatal care is the main guarantee of giving birth to a healthy baby. It is also the most cost-effective intervention method to reduce maternal (infant) mortality and complications before and after birth [3].

Proper nutrition is one of the determining factors of pregnant mother's health. Maternal nutrition during pregnancy should be balanced. Having a healthy diet during pregnancy is a reliable guarantee for a good pregnancy and childbirth. Proper nutrition also plays an important role in preventing and alleviating some pregnancy problems such as constipation, heartburn, anemia and urinary tract infection [4].

Pregnancy and lactation require proper nutrition and special attention, which is due to the body's need for nutrients and the important role nutrition plays for the fetus and infant. It is important to emphasize the necessity of achieving and maintaining a proper diet for maternal health during pregnancy and lactation. A variety of foods, such as milk, yogurt, cheese, meat, eggs, all kinds of grains and fresh vegetables, and fruits are recommended during this period. Maternal nutritional needs in different periods of pregnancy vary according to fetal growth and the mother's conditions. An ideal diet will provide not only for the usual day to day needs of the mother, but for the needs of the developing fetus as well as the future breastfeeding [5].

If pregnant women do not have the perfect knowledge of nutrition, it causes malnutrition during pregnancy which will have very bad effects on the fetus [6]. Pregnant women are highly vulnerable to malnutrition due to hormonal, metabolic and physical changes that increase their nutritional needs for nutritious foods. Inadequate nutrition leads to delayed intrauterine growth, miscarriage, preterm delivery, especially low birth weight (LBW) [7] and diseases such as non-insulin dependent diabetes, renal disease, hypertension and cardiovascular disease in adulthood [8].

Dietary superstitions are known in almost all human societies and may be found in various forms around the world. Pregnancy is seen as a critical period in the lives of women and is usually affected by food superstitions in order to save their lives and their babies [9]. In many small communities, pregnant women have unreliable dietary superstitions, which are believed to lead to a lack of access to vital nutrients [10]; Women in developing countries suffer from nutritional deficiencies, but social and cultural factors, including superstitions and taboos that may be related to malnutrition, have not been well studied [11].

Nutritional patterns and behaviors of pregnant women have strong cultural backgrounds and cultural beliefs which can determine the types of foods consumed, bans, and superstitions during pregnancy. Health care providers must be aware of these beliefs in order to target their performance in society, and those beliefs that are useful to pregnant women and their babies should be supported by scientific explanations. Vice versa, those beliefs that have a poor scientific base should be put aside by educating people in the community [12].

Based on what was said above, studies in Iran have limited information gaps in the analysis of pregnant women's beliefs about nutrition that are precisely based on the culture of their community and require conducting more qualitative studies. It is possible that the extraction and identification of women's perceptions and experiences about pregnancy nutrition could be of interest to health educators in designing and implementing appropriate educational programs and would provide the basis for promoting Iranian women's health. Therefore, the present study has aimed to explain the nutritional beliefs of pregnant women in Yazd.

## Methods

The present study was conducted between April to August 2019 to explore the beliefs of pregnant women in a qualitative study using conventional content analysis approach. Women who met inclusion criteria such as being pregnant, willing to participate in the interview, being native to Yazd, age range of 18-49 years, having a file at a health center near their place of residence, were considered as participants. Exclusion criteria included a history of underlying disease and psychological illnesses during pregnancy. Participants (12 pregnant women) were selected through theoretical and purposeful sampling and textual data collection continued until data saturation.

The researcher first obtained the telephone number of eligible pregnant women from the health department of the city health center. During the phone call with women and explaining the purpose of the study, they were asked about the appropriate time and place of interview. In this study, semi-structured in-depth interviews were used. Interviews with women took place in three session of focus group discussions. In group meetings, the group dynamic rules were used to guide the discussion and the participants were encouraged to share their experiences and knowledge of nutritional beliefs during pregnancy. Pregnant women were first asked to introduce themselves and state their pregnancy rating. Then there are questions like "What foods do you eat during pregnancy?" or "What traditional Yazdi foods (common in Yazd) do you eat during pregnancy?" It should be noted that during the interview, some in-depth questions such as "give an example, explain more, and what do you mean?" was used to expand and deepen the findings. Personal information such as age, education, occupation and pregnancy rating were also asked in addition to the main questions. The group interview was conducted in a calm and confidential environment. Interviews attempted to minimize interference with the interview process and at the same time preventing the diversion of the interview route. Also, with the follow-up questions, the interview process was guided to cover the research objectives. Focus group discussion sessions continued until no new data emerged and in other words data were saturated. The approximate duration of focus group discussion sessions was 30-45 minutes. Interviews were recorded with the prior permission of the participants, using a voice recorder; then the textual data were handwritten first and then typed.

After completing the stage of transcribing the group interviews and reaching the information saturation, a qualitative content analysis was performed. They were all coded according to conventional content analysis method and themes were extracted. The process of analyzing the data was based on the Granheim and Landman method in 2004, which include: 1. Conducting interviews and reviewing them several times in order to gain a proper understanding of all written materials, 2. Extracting semantic units and their classification as compact units, 3. Summarizing and classifying semantic units and selecting the appropriate label for them, 4. Sorting the subgroups by comparing similarities and differences in subgroups, 5. Selecting the appropriate title that can cover the created categories.

To evaluate and increase the scientific robustness of the findings and codes, categories were revised and compared with the data again. The method of review was used by the research colleagues to ensure the objectivity of the data. After coding and classifying the codes, the researcher provides the semantic units, codes, subcategories, and extracted main categories to the research team members to reach a general consensus. Interviews were re-reviewed if part of the research process was not approved by the team and referrals were made to the interviewers if necessary.

The ethical considerations of the present study included obtaining permission from pregnant women and their spouses as well as completing an informed consent form for women to record audio and ensure that their recorded information and voice were protected and that they volunteered to participate in or withdraw from the study. This study was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd-Iran under the code: IR.SSU.SPH.REC.1397.02.

## Results

The demographic data of 12 pregnant women participating in the focus group discussion are summarized in Table I. In this study, data were extracted by analyzing 10 main categories and 26 subcategories (Tab. II). The codes were 446 cases without overlap, which was reduced to 120 codes after closer examination and integration.

This section examines each of the categories and subcategories extracted. It was composed of four subcategories, namely "Definition of Prenatal Nutrition", "Importance of Prenatal Nutrition", "Healthy Nutrition" and "Unhealthy Nutrition". Pregnant women in this study defined the nutrition of pregnancy as dos and don'ts and consumption of healthy foods. For example, the participant 1 stated that "nutrition during pregnancy means the dos and don'ts during pregnancy". Pregnant women should also consume healthy foods and care for their nutrition due to the growth of their fetus. "At least during pregnancy, I tried to eat healthy because it had an impact on the baby" (P2). Regarding healthy eating subcategories, participant 4 stated, "In our opinion - Yazd people- meat, barbecue and Gormeh are nutritious and tonic foods; I ate these a bit more during my pregnancy; Now I have severe anemia so I am eating them again". Almost all of the participants believed that unhealthy nutrition means eating fast-food, soft drinks and junk food. "Soft drinks, hot dogs, sausages and a variety of foods that may be allergic and may have a negative impact on

**Tab. I.** Study participants demographic features.

| Age of pregnancy | Job | Education | Rank of pregnancy | Age | Code |
|---|---|---|---|---|---|
| 15 w | Housekeeper | High school | 1 | 18 | 1 |
| 12 w | Employee | Student | 2 | 27 | 2 |
| 14 w | Housekeeper | Diploma | 2 | 33 | 3 |
| 21 w | Employee | Bachelor | 3 | 39 | 4 |
| 10 w | Teacher | Bachelor | 3 | 45 | 5 |
| 15 w | Housekeeper | Bachelor | 1 | 27 | 6 |
| 32 w | Worker | Diploma | 2 | 36 | 7 |
| 28 w | Teacher | Bachelor | 2 | 31 | 8 |
| 20 w | Employee | Bachelor | 2 | 37 | 9 |
| 17 w | Housekeeper | Associate | 1 | 26 | 10 |
| 30 w | Housekeeper | Associate | 2 | 34 | 11 |
| 18 w | Worker | Diploma | 1 | 40 | 12 |

**Tab. II.** Categories and subcategories extracted from the analysis of focus group interviews.

| N | Main category | Subcategory |
|---|---|---|
| 1 | The concept of nutrition during pregnancy | Defining nutrition in pregnancy<br>The Importance of Nutrition in Pregnancy<br>Healthy nutrition<br>Unhealthy Nutrition |
| 2 | Nutrition limitations during pregnancy | Prohibition of Nutrition in Pregnancy<br>Obstacles to proper nutrition in pregnancy |
| 3 | Myths about food during pregnancy | Feelings about pregnancy nutrition<br>Selective tendency<br>Forced / voluntary use |
| 4 | Doubts about nutrition during pregnancy | Nutritional ambiguities in pregnancy<br>food superstitions in pregnancy |
| 5 | Pregnancy food style | Pay attention to food units and calories<br>Changing diet before and during pregnancy<br>Observe the diversity in food consumption<br>Consume local food and herbal medicine in pregnancy<br>Supplements in pregnancy |
| 6 | Sources of nutritional information in pregnancy | Important others<br>Trust / distrust to advices from important others |
| 7 | Positive Consequences of Healthy Nutrition in Pregnancy | Delivery facilitators<br>Inhibitors of neonatal jaundice |
| 8 | Consequences of inappropriate pregnancy nutrition | Causes of neonatal jaundice<br>Physical problems of pregnant woman |
| 9 | Religious Beliefs in Pregnancy Nutrition | The Influence of Food on the Narrative View<br>Religious practices |
| 10 | Social support | Spouse supportive behaviors<br>Supportive behaviors of mother / mother-in-law |

the fetus. I put them in the unhealthy diet category"(P2). It was divided into two subcategories, entitled "Nutrition Prohibitions in Pregnancy" and "Prohibition of Proper Nutrition in Pregnancy". Concerning dietary restrictions, participants stated that consumption of sheep's liver, carrot juice, honey, saffron, and barberry can lead to miscarriage, especially during the first months of pregnancy. So these items were removed from their food basket. "I didn't drink too much carrot juice; I didn't even eat sheep's liver "(P1). "They said I should not eat some things. For example, they said I should not consume saffron or honey too much and I should not eat hot foods too much as well" (P7). According to the pregnant women in the present study, barriers to nutrition may include lack of proper nutrition, inappropriate economic status, occupation of mother, and longing of pregnant women. "Foods are expensive and this in itself prevents proper nutrition, but one has to get the food they need in pregnancy" (P7). "Now, because craving bothers me, I tend to eat less" (P10).

This category was composed of three subcategories naming "feelings about nutrition during pregnancy", "food choice in pregnancy" and "forced / voluntary consumption of food in pregnancy". In this study, pregnant women expressed their inner feeling about eating or not eating: "I can't eat the dried apricot, almond and any other dried goods. They say it's good, but I can't eat, so I don't feel good about eating"(P4)." The things that make me feel good, I love to eat. The rest I felt bad as I looked at them such as meat" (P1). Pregnant women would choose foods based on their desire for certain foods. That is, in pregnancy they would interpret their particular desire to "have a craving" for certain foods. For example, participant (1) said "Now I eat whatever I crave. If I don't crave something, I can't eat it, there is not so much else to do" (P1). "After all, a mother in her pregnancy hates many things she has loved before, and loves some things she used to hate, for example, at this moment I do not like sweets at all" (P3). Pregnant women have to consume some foods due to their nutrition and positive impact on their physical condition and fetal development, and on the other hand, some foods have to be avoided. "Well I feel like I have to eat some foods during pregnancy. Just because they are good for my health" (P3). "Pregnant women have to consume some nutrients during pregnancy" (P7). There were some doubts about whether or not some foods were consumed by pregnant women. For example, they doubted if they should consume tomatoes or fish because they believed that consuming too much tomatoes or fish would cause malfunction and decrease infant's IQ level. It was composed of two subcategories with "nutritional ambiguities in pregnancy" and "prenatal nutrition superstitions". Pregnant women had doubts as to whether or not to eat certain foods during pregnancy. An example of the ambiguities of pregnant women is: "I have heard in recent months that we should eat liver. I do not know why, but I am going to do it" (P5). Some superstitions have long been prevalent among pregnant women but our participants despite their knowledge, did not adhere to those superstitions. "For example, they say that if you drink seawater, the color of infant's eyes will turn blue. It is superstitious. I do not accept anything like this." Pregnant women believe that the dietary style of pregnancy is different from that of pre-pregnancy. This is composed of 4 subcategories: "Paying attention to food unit and calorie", "Pre-pregnancy diet change", "Variety in food intake", "Local food consumption and herbal medicine in pregnancy" and "Supplements In pregnancy". Pregnant women participating in the present study emphasized the importance of the unit and amount of food consumed during pregnancy. "It's good for a pregnant woman to know what she's eating - how much protein she's eating - but well, it's hard for us to calculate especially now that we don't have the expertise." (P2). "Some foods should be consumed less while excessive consumption of certain foods is not good" (P3). According to pregnant women participating in the study, diet should be different from before pregnancy. "I had no interest in consuming sweets before I got pregnant but now I eat a lot of sweets" (P7). "One cannot eat anything like when she was not pregnant, but the amount of my food is lower than before "(P6). The participants acknowledged that the principle of diversity should be respected during pregnancy. For example, participant # 8 stated: "There is no need to eat special foods during pregnancy. Everything has to be eaten and I eat everything." Or another participant stated, "The doctor said, eat everything, but don't eat too much, and I eat everything"(P7). Concerning the subcategory of consumption of local food and herbal medicine in pregnancy some pregnant women believed that herbal medicine should not be used during pregnancy. For example, participant 1 acknowledged "gynecologist said that herbal medicine should not be used too much. The doctor said you could not take herbal medicine".

The perception of pregnant women participating in the study about the usefulness of supplements in pregnancy is significant. "I have a very severe anemia and I take iron pills now" (P4).

Pregnant women in the present study acknowledged that they gained information about their pregnancy nutrition through their surroundings and cyberspace. It consisted of two subcategories under the heading "Important Others" and "Trusting or not trusting the recommendations of important others". "Important others" in the present study are mother, mother-in-law, spouse, internet, cyberspace, friends, neighbors and books. For example, participant number one stated, "I use the Internet for my nutritional information."

"Older people were also recommending us to eat local bread and so we would" (P8). Some pregnant women trusted information, and some did not trust information from "important others".

"I am very attentive and act on the advice of my spouse, mother and mother-in-law" (P7).

"I listened to everyone around me and trusted them" (P8). "My mother-in-law doesn't do much for me. They don't say anything special about pregnancy. Of course, they used to say a lot about my previous pregnancy, but I didn't trust them very much and I didn't act" (P2). This

was composed of two subcategories, namely "neonatal jaundice inhibitors" and "delivery facilitators". Some pregnant women found the effect of consuming cool foods to prevent infant's jaundice. "I started consuming chicory tea right now to prevent my baby's jaundice. I use jujube as it is cool, so my baby doesn't get jaundice" (P7). "In the ninth month of my previous pregnancy, I always drank chicory tea which had a cool nature so that my baby would not get jaundiced" (P6). Pregnant women also believed that some foods such as saffron, rose water, barberry, etc., would facilitate delivery. "I believe vegetables would make delivery easier" (P7). "I have heard that eating saffron, barberry and honey and carrot in the last months will make your delivery easier" (P5). This part was composed of two subcategories which were "causes of neonatal jaundice" and" physical problems of pregnant women ". Some pregnant women saw the effect of warm-natured foods as a cause of neonatal jaundice. My first child had jaundice that was said to be due to eating warm-natured foods during pregnancy" (P5). Pregnant women reported some physical problems during pregnancy such as gastric bloating, weight gain and inactivity. "For example, when I eat too much, I get bloated or heavy in the stomach and I get hurt" (P6). "I have heard that we should not eat yogurt alone because yogurt alone can increase appetite and increase weight and lead to obesity" (P5). This part was composed of two subcategories, entitled "The Influence of Food from the Narrative View" and "Religious observance". Pregnant women found some foods to be effective on the baby's physical beauty and its intelligence. "I eat apples and peaches because I have heard them say that if you eat apples and peaches the baby will become beautiful" (P7). "I have read in the narratives that eating "Quince fruit" increases "the intelligence of a child" (P2). Pregnant women considered attending Quranic teachings and practicing hadiths effective during their pregnancy. "I read in the narrations that if I had ablution during my pregnancy, my baby would be quiet and in peace when born. So I am always with ablution" (P2). "I used to read surahs of the Quran during my pregnancy. I also read Quranic verses on fruits and then ate them" (P8). The theme consisted of two subcategories, namely "supportive behaviors of the husband" and "supportive behaviors of the mother or mother-in-law". Pregnant women stated that their husbands' support for nutrition during pregnancy was needed. "My husband urges me to consume fish, shrimp and sea food in general for their phosphorus." (P11). "My husband insists on not eating fast food and soft drink during pregnancy" (P4).

#### Supportive behaviors of mother/mother-in-law

Pregnant women stated that they were supported by their mother or mother-in-law and that the support they received, especially from their husbands, was found to be effective in helping to calm the heart. "One of the main people to tell me what to eat was my mom" (P2). "My mother-in-law advised me on the use of herbal medicine in pregnancy" (P12).

## Discussion

In this study, Yazdi pregnant women share their experiences and perceptions about the dietary style of pregnancy, definitions of the concept of pregnancy nutrition, dietary restrictions, superstitions, information and trust sources, religious beliefs, social support, etc.

Sedaghati et al. argue that the importance of pregnancy is that maternal health directly influences the life of another person [2] In this regard, the participants emphasized the importance of healthy nutrition during pregnancy and considered it necessary to consume healthy foods; Kamalifard writes that proper nutrition is an important part of a healthy pregnancy and proper nutrition education can play an important role in promoting maternal and child health [13] which was consistent with the findings of the present study.

The perceptions of women participating in the study about unhealthy foods in pregnancy were consumption of leftover and multiple heated foods, fast foods and sauces. Sehati and colleagues acknowledge that the type of maternal nutrition of pregnancy affects the weight and birth of the infant [14], indicating the importance of consuming the necessary nutrients during this time. In this study, participants were also aware of the impact of eating healthy and adequate food during this time. Pregnant women in this study cited barriers to nutrition during pregnancy, such as poor economic status, unwanted pregnancy, not having enough time to cook because of employment, welfare, insufficient study, and lack of knowledge about proper nutrition. For a safe pregnancy, pregnant women should buy and consume food in an appropriate way. Women with poor economic status may face restrictions that may affect their pregnancy. In the study of Yadegari et al. (2017), 30.9% of pregnant women did not have food security; they stated that food security is related to socioeconomic factors of the family, monthly income and monthly cost of food supply [15]. Working women who participated in this study stated that they did not have enough time for cooking and preparing proper nutrition for themselves during pregnancy and therefore felt deficient in themselves; In this regard, Jong (2017) and colleagues in their study found that energy, protein, vitamin B2, vitamin C, calcium and potassium levels were significantly lower in working pregnant women [16]. The present study also emphasized unwanted pregnancy as a barrier to proper nutrition in the group discussion. Yazdkhasti et al. (2015) reported that about 40 percent of pregnancies in Iran are unwanted, with a greater percentage ending in miscarriage which can cause serious irreparable harm to the mother and also affect the quality of life [17]. Another obstacle to proper nutrition in pregnancy is the high prevalence of Hyperemesis gravid arum known as craving among pregnant women in the present study. Gabra (2018) emphasizes the psychological and brain complications and malnutrition and craving of pregnant women [18]. Having enough knowledge about pregnancy nutrition can have beneficial consequences for pregnant women, as Lee et al. (2018) concluded in their study that preg-

nant women did not have sufficient information about pregnancy nutrition and received inadequate nutritional information from healthcare providers [19] Karimi et al. (2017) study also showed that only 26% of pregnant women in Saveh had good knowledge about pregnancy nutrition [11]. Pregnancy dietary restrictions for women include foods that should not be eaten during pregnancy (for example, consumption of honey and carrot juice during the first months of pregnancy) and women fear and had a particular apprehension about consuming such foods in pregnancy. Therefore, in order to raise awareness, attitude, practice and reduce the concern of pregnant women regarding proper and inappropriate nutrition during pregnancy, it is recommended that educational programs based on dietary patterns appropriate to their beliefs and cultural behaviors be held for them before and during pregnancy. In a focus group discussion, most pregnant women stated that despite their strong interest in fast food, they did not eat it because it was harmful to their fetus and were part of their dietary restrictions. The results of a recent study on fast food consumption in pregnancy showed that repeated fast food consumption in pregnancy is associated with an increased risk of asthma and rhinitis in children [20].

Pregnant women in this study had to consume some foods because of their properties and even despite their high cost and had to avoid certain foods despite their interest. This topic is called the Voluntary / Forced Tendency Subcategory within the category "Mental Imagination about Pregnancy Nutrition". Concerning the above category, pregnant women reported a change in tastes and a pleasant feeling about some foods, which is in line with the results of Reyes et al.'s (2013) study [21]. In this study, despite women's high awareness of nutritional superstitions during pregnancy, they did not adhere to them and did not practice them. This finding was consistent with the study by Ugwa et al. [22] but was not consistent with the study of Demissie et al due to the high prevalence of food superstitions [23]. Concerning the description of the prenatal nutrition categories, extracted in the present study, in this study, a number of women during pregnancy had increased consumption of red meat due to vigorous anemia and relieving anemia and physical endurance compared to pre-pregnancy, which was not consistent with the study by Zerfu et al. (2016). Because they believed that a vegetarian diet based on the consumption of fruits and vegetables in pregnancy would make delivery easier [24]. Another finding of this study was that the majority of participants believed that due to the fetus's need for nutrition during pregnancy, the number of maternal meals should be increased and the amount of food consumed reduced, which was consistent with the study of Ugwa et al (2016) [22]. But it is not consistent with the results of the study by Ojofitimi et al. (1982) [25]. According to pregnant women in the present study, the principle of diversity should also be observed during pregnancy. During the day, in addition to food, other things such as fruits, vegetables and nuts should be eaten. In the view of the participants, all the food was of value. Balance means consuming sufficient quantities of food and diversity means consuming the types of foods that are in the food groups. In each food group, the nutritional value of the ingredients is approximately the same and suitable substitutes can be used [26]. According to research by Burrowes et al. (2006), physiological changes in pregnancy require more energy to deal with increased blood volume, maternal body tissue growth, fetal growth and development, and maternal readiness for breastfeeding, which can be supplied from a variety of foods [27]. This is an affirmation of the principle of diversity in pregnancy nutrition. Also, in this study, women tried to avoid excessive use of herbal remedies and, if necessary, had enough and used it with a doctor's prescription. This finding contrasts with the study by Forster et al. (2006) who used herbal remedies such as ginger and chamomile during pregnancy [28]. In this study, most pregnant women obtained their nutritional information through their physicians and healthcare providers, books, media, mothers, and mother-in-laws. Celia et al. (2016) stated in their study that the sources of knowledge of pregnant women included healthcare providers in healthcare, social settings, and mass media, which was consistent with the present study [29]. In addition, pregnant women identified their mother as one of the most important sources of information that they have high confidence in. Martel (1990) concludes in his study that when a girl becomes pregnant, intimacy between her and her mother increases, with girls receiving more help from their mother [30]. In another study by Hromi et al. (2016), family dietary recommendations have been considered an important factor in increasing fruit and vegetable consumption by pregnant women [31]. Another potential issue raised by the research units of this study was the role of facilitators of delivery. Pregnant women and their spouses in this study considered consuming rose water, saffron, and vegetables in the last months as a convenient delivery method; in a study by Lennox et al. (2017), eating less food was considered as a facilitator for childbirth [32]. In the study of Martin et al. (2015) having a Dietary Approaches to Stop Hypertension (DASH) diet was known to be a contributing factor to preterm delivery [33], which was in line with the positive outcomes of nutrition in pregnancy in the present study. The results of this study showed that a limited number of participants experienced physical problems during pregnancy such as gastric bloating, nausea, vomiting, weight gain and sedentary behavior. This finding is in line with the study by Yeasmin et al. (2016), in which some women reported having nausea and vomiting during pregnancy [34]. Pregnancy is typically considered a period of vulnerability for women and one of the major risk factors for maternal health is the lack of social support [35]. Spouses' support in this study was reported to provide the pregnant woman with food despite the high cost and psychological support. In the study of Ugwa et al (2016), about 53% of women had the support of their husbands, which was more effective than the support of others [22]. From the perspective of the women in this study, religious teachings have a significant effect on the type of food consumed by women during pregnancy and

lactation. Participants in this study found that halal eating during this time was effective; they also believe in that prayers such as Ziarat-e-Ashura, Ayat al-korsi, spiritual rituals, Qur'anic verses, and hadiths to calm and even enhance infant's memory. One of the most important factors that can have a profound effect on the human spirit and education is the issue of "eating the lawful and forbidden" and in this way he must make every effort to obtain a halal and not to eat but halal food. Nutrition is lawful and forbidden by the Creator. The effect of the halal food also affects the fetus in the mother's womb. The Prophet (peace be upon him) says: Raise your children in the womb of their mothers. How is this possible, or Prophet Muhammad? They said: by eating halal food to their mothers [36]. In general, it can be deduced that the women in the present study were bound to their own nutritional beliefs that derive from their culture, and this study was able to provide a clear picture of the cultural beliefs of Yazdi women regarding nutrition during pregnancy.

## Conclusions

Health education experts should identify and explain qualitative approaches to pregnant women's nutrition beliefs during pregnancy and subsequently use culture-based approaches to minimize dietary misconceptions. It is suggested that proper education be provided to improve the nutrition of pregnant women.

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## Conflict of interest statement

The authors declare no conflict of interest.

## Authors' contributions

SSMM involved in the conception and designing the study. SS. wrote the manuscript and acted as corresponding author. MKH performed the data analysis and interpretation. SSMM, MKH, AN and HF supervised the development of work, helped in data interpretation and manuscript evaluation. SSMM helped to evaluate and edit the manuscript.

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