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Original Research Article

Knowledge, attitudes and practices regarding maternal nutrition in pregnant women in an urban population: an observational cross-sectional study

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ABSTRACT

Background: Pregnancy entails profound physiological as well as psychological shifts that elevate nutritional requirements. Hence, optimal intake during pregnancy and lactation is essential to optimize maternal health and fetal development. There are various factors like mother's nutritional reserves, dietary intake, and others that significantly influence maternal and perinatal outcomes. Therefore, assessing women's awareness and behavior regarding nutrition becomes important. Knowledge, attitude and practice studies are useful tools in assessing the nutritional awareness of pregnant women as well as identifying gaps in understanding and guiding effective interventions accordingly.
Methods: A cross-sectional descriptive hospital-based study was carried from April to June 2025. This study consisted of a multiple-choice questionnaire testing the knowledge, attitude and practice of 585 pregnant females visiting the obstetrics department outpatient services at a tertiary care hospital in Mumbai.
Results: We considered factors like parity and education that may affect the knowledge, attitude and practice assessment of the nutrition in pregnant women. The participants demonstrated comparatively limited knowledge about nutrition during pregnancy (mean score: 4.42). However, their attitude showed a positive response (mean score: 4.356) and the practice score exceeded their knowledge score (mean score: 4.52).
Conclusions: In our study, we found some loopholes in the people's knowledge, attitude and practices of nutrition in pregnancy which highlights lack of awareness and correct knowledge amongst the people about the same.

Keywords: Dietary choices, Maternal nutrition, Pregnancy, Urban population

INTRODUCTION

Pregnancy is a critical period in a woman's life, marked by profound physiological and psychological changes.[1] During this time, the demand for energy, macronutrients, and micronutrients rises significantly to support maternal well-being and fetal growth.[2] Therefore, optimal nutrition during pregnancy and lactation is essential, as it directly affects maternal health as well as fetal development and outcomes.[3] Epidemiological studies indicate that maternal nutrition not only affects the intrauterine growth of fetus but also may contribute to cardiovascular and metabolic defects in future in the child.[4]

The nutrient available to the developing fetus depends on the mother's nutritional reserves, dietary intake, and physiological requirement of pregnancy.[5] Additionally, pre-pregnancy diet and nutritional status, including body mass index (BMI) and micronutrient adequacy can considerably influence maternal and perinatal outcomes. Despite increased awareness, micronutrient deficiencies still remain a global concern. The World Health

Organization estimates that around two billion people are affected, women being particularly vulnerable due to menstrual blood loss and the high metabolic demands of pregnancy.[6]

Maternal malnutrition and micronutrient deficiencies are prevalent in low- and middle-income countries (LMICs). This leads to complications such as maternal anemia, delayed fetal growth, preterm birth, and low birth weight.[7-10] Despite various governmental initiatives, maternal and child malnutrition and anemia continue to be leading causes of health loss in India.[11] These adverse outcomes not only affect individual health but also represent significant barriers to socioeconomic development.

Knowledge, attitude, and practice (KAP) studies are useful tools in evaluating the nutritional awareness of pregnant women as well as identifying gaps in understanding and guiding effective interventions accordingly. Providing nutrition education and evidence-based dietary advice during antenatal visits can help correct misconceptions and promote healthier practices.

Thus, assessing the knowledge, attitudes, and dietary practices of pregnant women becomes crucial in understanding how nutritional awareness influences both maternal and fetal outcomes, and in identifying areas for targeted interventions.

Aim

To assess the knowledge, attitude and practices about nutrition in pregnancy among pregnant women living in an urban region in India.

Objectives

Identify dietary practices underlying the nutritional problems. Identify individual-level determinants of these practices, such as nutrition-related knowledge and attitudes.

METHODS

A cross-sectional descriptive hospital-based study was carried from April to June 2025. This study was conducted among pregnant females visiting the obstetrics department outpatient services at a tertiary care hospital in Mumbai.

Sample size

For the present study, the sample size was calculated with power 80% and confidence level of 95%, considering knowledge proportion as 60.9 % and absolute error as 4 and non-response rate of 5% and for the finite population, the total sample size was found to be 585.

Sampling method

Systematic random sampling was used and every 3rd pregnant woman visiting the obstetrics outpatient services was included in the study as they registered until the desired sample size was fulfilled. The first sample was chosen by simple random sampling by lottery method.

A semi structured pretested questionnaire was used for data collection.

The written informed consent was obtained from the study subjects in 3 languages (English, Hindi, Marathi). Study conduct data was collected on socio-demographic characteristics. Nutrition knowledge consisted of 11 questions regarding the need of extra food, different food groups, sources of nutrients, supplement nutrients, and avoidable substances during pregnancy. Attitude consisted of 7 questions which included nutrition during pregnancy, likes and dislikes. Actual dietary practices consisted of 6 questions during pregnancy.

Inclusion criteria

Pregnant females between age 18 to 40 years visiting the obstetrics outpatient services and giving consent for study participation were included in the study.

Exclusion criteria

Pregnant females not giving consent for the study participation were excluded from the study. Pregnant women on special diets (like gestational diabetes, gestational hypertension, severe anemia) were excluded from the study

KAP score

Participants' answers to questions assessing knowledge were given a score. One point was assigned for correct answers for all questions of nutritional knowledge, then the sum of correct answers was obtained (the sum of total scores for these questions ranged from zero to eleven points maximum score).

Participants' answers to questions assessing attitude were given a score. One point was assigned for positive attitude for all attitude questions and zero point was assigned to both uncertain and negative attitude, then the sum was obtained (the sum of total scores for these questions ranged from zero to seven points maximum score).

Participants' answers to questions assessing practices were given a score. One point was assigned for correct answers for all dietary practices questions KAP scores, then the sum of correct answers was obtained (the sum of total scores for these questions ranged from zero to six points maximum score).

Data analysis

Analysis was done using SPSS version 26.0. Descriptive statistics were calculated. Pearson correlation was used to see the correlation between the age and total score, and $p<0.05$ was considered as significant. An independent sample test was applied to find out the mean difference between primigravida and multigravida. Anova test was used to find out the mean difference across different categories of education.

RESULTS

In this study a total of 585 pregnant women were interviewed. The mean age of the pregnant women was 26.31 (4.2) and minimum age was 18 and maximum age was 40 (Figure 1). The mean monthly income of their family was 16272.65 (11608.64) Indian Rupees. Majority of them belong to 21 to 25 years (39.1%) followed by 26 to 30 years (38.5%), only 6.3% and 2.4% belong to extremes of age (<20 years and >35 years). Majority of them have completed higher secondary education (37.1%) followed by secondary education (28.5%) and primary education (20.7%). Only few of them are graduates (7.2%) and least among them were either illiterate or had not completed their primary education (6.5%). We found a significant weak correlation between age and practice of nutrition during pregnancy (Pearson coefficient r=0.1) ($p<0.05$).

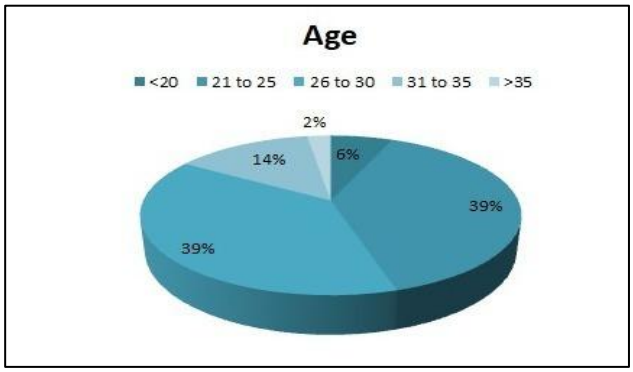

Figure 1: Age distribution of participants.

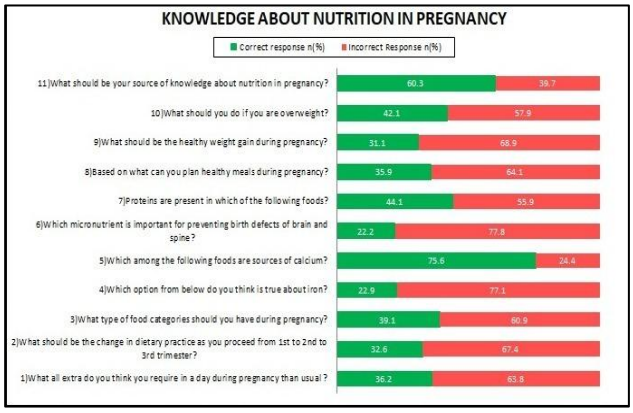

Figure 2: Knowledge assessment.

The knowledge assessment results as shown in Figure 2 indicate that there are varying levels of understanding among respondents regarding nutrition during pregnancy. Some areas of concern include misconceptions about extra requirements during pregnancy (63.8%) and dietary changes across trimesters (67.4%). Many respondents couldn't correctly identify recommended food categories (60.9%) and true statements about iron (77.1%). However, there were some areas where respondents showed better awareness, such as identifying calcium sources (75.6%) and the source of knowledge about nutrition during pregnancy (60.3%). Overall, respondents had limited understanding of essential aspects of prenatal nutrition, including the micronutrient necessary for preventing birth defects (77.8%) and the basis for planning healthy meals (64.1%).

The mean (SD) score of the knowledge about nutrition during the pregnancy was 4.42 (2.1).

The attitude assessment results as shown in Figure 3 revealed that respondents recognized the negative impact of improper eating (41.5%) and inadequate eating (58.3%) on the fetus, the detrimental effects of inadequate nutrition on their own bodies (59.0%). Furthermore, a large proportion perceived antenatal visits as effective (77.1%) and recognized their role in identifying health risks (59.0%). Moreover, respondents exhibited awareness of the harmful effects of alcohol and tobacco consumption (73.2%) and expressed consciousness about food choices during pregnancy (67.5%).

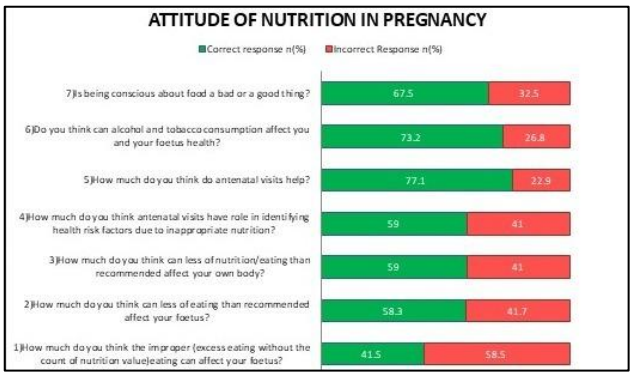

Figure 3: Attitude assessment.

The mean (SD) score of the attitude about nutrition during the pregnancy was 4.356 (1.71).

The practice assessment results as shown in Figure 4 reveal that a significant majority of respondents engage in positive behaviors related to prenatal care and nutrition. Specifically, 78.8% of respondents reported consuming healthy snacks, while 79.1% adjusted their food amounts across trimesters. Additionally, 83.8% reported regularly taking prescribed supplements, and 79.0% planned their meals based on personal factors. However, 37.3% of respondents expressed skepticism about the reliability of

external nutrition sources, and 94.0% of respondents reported following their doctor's advice.

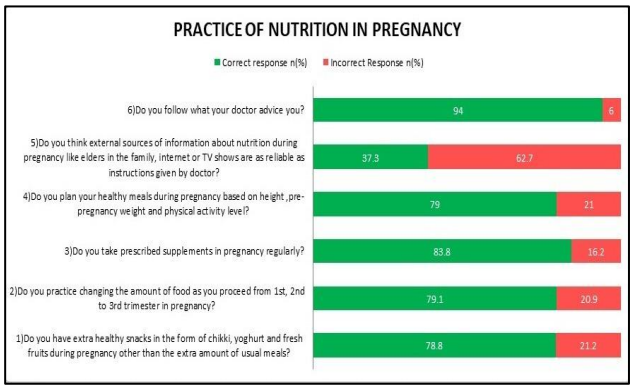

Figure 4: Practices assessment.

The mean (SD) score of the practice about nutrition during the pregnancy was 4.52 (1.11).

The comparison of mean score across different gravidas is given in Figure 5, shows that there was no significant difference in the mean score of knowledge, attitudes and practices of nutrition between primigravida and multigravida (independent sample test p>0.05).

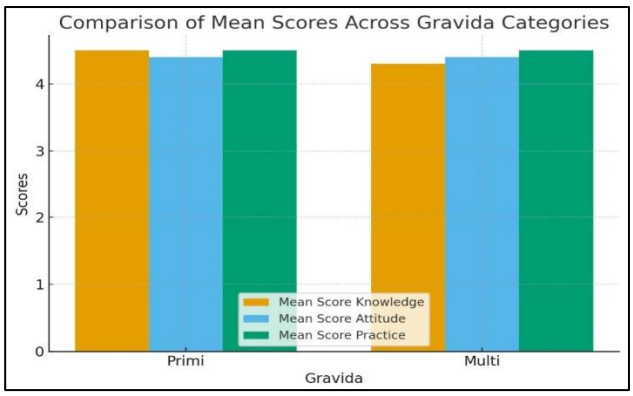

Figure 5: Comparison of mean scores across gravida categories.

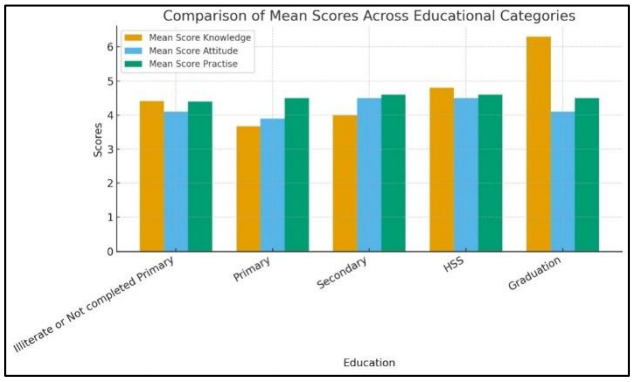

Figure 6: Comparison of mean scores across educational categories.

Comparison of mean scores across different educational categories is given in Figure 6 which shows that there is a significant difference in the mean scores of the knowledge and attitude across the different educational categories (Anova test p<0.05), but when it comes to practice, we could not find any difference in score.

DISCUSSION

Having nutritious food is an important aspect for the health of humans and its necessity increases during pregnancy as it has an impact on the health of both mother and child. Present study was conducted to evaluate the knowledge, attitude and practices regarding maternal nutrition in pregnant women in the age group 18-40 years, of Mumbai, western India

39.1% percent of the study participants were in the age group of 20-25 years, this is similar to a study conducted in Ethiopia wherein 48.2% of women were from the age group of 15-25 years.[12] Observations of present study have shown that 7.2% of the participants had an education level of graduation or above, this finding is similar to a study conducted in Ethiopia, where 9.3% of pregnant women were educated above graduation.

The questions in the questionnaire from the knowledge section focus on type of diet, amount of diet and planning of diet by the pregnant women. The same was asked in the practice section to compare the same aspects from knowledge. There was also comparison of knowledge and practice in terms of sources of nutritional education. In the attitude section questions were about perceiving the health of mother and baby in terms of severity, susceptibility and health benefits of proper nutrition.

These questions in general cover the essential knowledge which pregnant women must have to get good nutrition in pregnancy, as given by the American Journal of Obstetrics and Gynecology.[9]

The mean (SD) score of the knowledge, attitude and practices about nutrition during the pregnancy was 4.42 (2.1), 4.356 (1.71), 4.52 (1.11) indicating 40.2%, 62.2%, 75.3% correct response respectively.

In a study conducted in Ethiopia, research showed only 64.4% of women had knowledge about nutrition during pregnancy. There was a positive significant relation between educational status of mothers and nutrition knowledge of mothers during pregnancy.

In a study conducted among Syrian refugees, 53% had insufficient dietary knowledge and 47% poor dietary practices during pregnancy.[13] The knowledge score was 44% in this study, while the score of practices was more as compared to the score of knowledge. The findings suggest people have poor knowledge about the things which they follow/practice.

The comparison chart on individual questions is shown in Figure 7. Some poor versus good responses are shown in Figure 8.

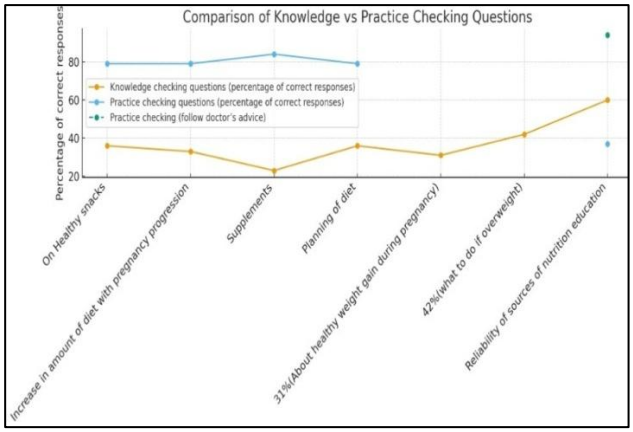

Figure 7: Comparison chart on individual questions.

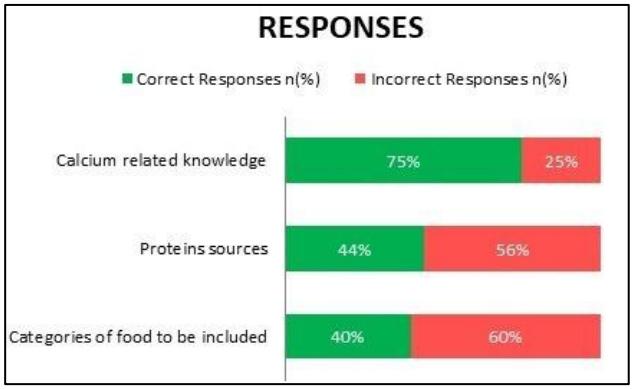

Figure 8: Some poor versus good responses.

While comparing the response to knowledge with practice questions, 79% of women responded yes to including snacks, but only 36% had knowledge of what their pregnancy diet should be like. About 79% claimed they change the amount of food as they proceed across trimesters, but only 33% had knowledge that they should raise the amount of food intake. About 84% claimed to use supplements, but only 23% were knowledgeable about it. 79% of women were planning their meals during pregnancy but only 37% had knowledge of diet planning. 31% had correct knowledge about healthy weight gain during pregnancy, 42% of women knew what should be the proper option to choose if they find themselves overweight. The majority of the participants (87%) reported regular antenatal care visits and intake of iron and folic acid tablets.

Our findings showed that pregnant women in the age group of 18-40 years practice habits which they don't have adequate knowledge about. They have a faulty attitude towards diet related practices. This results in incorrect practices, leading to health hazards to the fetus and mother. These findings correlate with a study done in India.[7]

The woman's husband and doctors were major influencers for making their food choices. Participants knew that there is a requirement of additional nutrition during pregnancy but they were not aware about the balanced diet and right food choices. Thus, there is a need to further educate them about the importance of choice of diet in pregnancy; not only to pregnant women but also to their spouses.

19% of the participants reported that the balanced diet consists of all essential nutrients in adequate amounts and 14% described a balanced diet as energy and strength giving food. One in ten of the total study participants reported that foodstuff having lesser fat and oils make a balanced diet. 14% of the participants reported vegetables as an essential component of a balanced diet and 6% of them reported fruits as a constituent of balanced diet. 5% of the participants reported a balanced diet consisting of adequate carbohydrates, proteins and fats. While 1% reported that a balanced diet consists of iron and minerals.

Our study showed that pregnant women have poor knowledge about nutrition and have unreliable sources of knowledge of pregnancy nutrition.

An exploratory cross-sectional study done in Delhi, India revealed that almost 80% (274 out of 344) women received some form of ANC but the care received was inadequate.[14] Determinants for non-utilization of ANC were poverty, literacy, migration, duration of stay in the locality and high parity. Counselling on nutrition was reported by a fourth of the population. This study showed that despite the ANC provision, absence of nutritional counselling resulted in poor nutritional status.

Pregnant women living in urban poor settlements also have poor nutritional status. This may be improved by strengthening the nutrition counselling component of ANC which is inadequate in the ANC already being received. Empowering community-based health workers in providing effective nutrition counselling should be explored, given the state of the overburdened public health system in India.

Similar research done in Ethiopia showed only 64.4% of women had nutrition knowledge during pregnancy. There was a positive significant relation between information about nutrition, educational status of mothers and family income and nutrition knowledge of mothers during pregnancy ($p<0.001$). The knowledge of pregnant mothers was relatively low in this study. Information about nutrition, family income and educational status of mothers had a positive significant relation with mothers' nutrition knowledge in the study area. Hence, the government in collaboration with concerned bodies should focus on nutritional education and information about nutrition to increase the knowledge of pregnant mothers on nutrition and put it in practice during pregnancy in the study area.

In our study, the participants demonstrated good practices, but it could be highly influenced by interview bias; due to hesitancy to give a negative response to the advice of the caregiver. Furthermore, inconsistencies between self-reported practices and laboratory findings suggest that actual practices may not be as optimal as reported.

In our study, a flawed attitude was observed, as only 41% of women correctly understood the impact of eating less on their own health. When participants were asked about the effects of eating either more or less than the recommended amount on the fetus, 58% responded accurately. Additionally, 67% of participants agreed that being careful of food intake during pregnancy is beneficial. Regarding antenatal visits, 59% of pregnant women correctly recognized their role in identifying health risks associated with poor nutrition.

Also, as shown by a 37% correct response to questions asked about knowledge of reliability of sources of nutritional education (which were elders in the family, internet or TV), showed being considered by the participants as equivalent to a doctor's advice. Hence, showing what forms, the basis of decisions made by pregnant women about nutrition.

CONCLUSION

In our study, improper sources of guidance and faulty attitude towards pregnancy nutrition are shown to be responsible for poor knowledge of pregnant women. It showed that for something as important as pregnancy nutrition, pregnant women follow certain preconceived ideas that are not based on facts. It is due to increased interest in the desire of a healthy fetus, and so women take extra efforts to follow healthy dietary practices. But this is a transient improvement in dietary practices, only for the period of pregnancy. They have lack of awareness about the importance of pregnancy nutrition and poor knowledge regarding various aspects of nutrition like frequency of meals, amount of food to be included in different trimesters, categories of food to be included, and a lot more. These all aspects should be sought for while dealing with solutions to problems like poor pregnancy nutrition, which requires precise guidance and awareness to combat preconceived ideas.

The solution to this problem is proper nutritional education and making nutritional problems clearer to pregnant women. That can be done by providing for consultation with a dietician to each and every pregnant woman, rather than a group knowledge provision. Making the diets personalized by asking them about the change in structure of food intake (amount and frequency) with pregnancy according to individual height, weight, work pattern, categories of food to be included, based on what meals should be planned in pregnancy etc. This can change knowledge and awareness of pregnant women towards pregnancy diet ultimately resulting in healthy and safe pregnancy outcomes.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Abou Haidar MY, Bou Yazbeck E. Knowledge, attitude and practices toward nutrition and diet during pregnancy among recently delivered women of Syrian refugees. J Refugee Glob Health. 2018;1(2):6.
2. Mousa A, Naqash A, Lim S. Macronutrient and micronutrient intake during pregnancy: an overview of recent evidence. Nutrients. 2019;11(2):443.
3. Talebi S, Kianifar HR, Mehdizadeh A. Nutritional requirements in pregnancy and lactation. Clin Nutr ESPEN. 2024;64:400-10.
4. Shulman R, Kottke M. Impact of maternal knowledge of recommended weight gain in pregnancy on gestational weight gain. Am J Obstet Gynecol. 2016;214(6):754.e1-7.
5. Ramakrishnan U, Grant F, Goldenberg T, Zongrone A, Martorell R. Effect of women's nutrition before and during early pregnancy on maternal and infant outcomes: a systematic review. Paediatr Perinat Epidemiol. 2012;26(1):285-301.
6. Stephenson J, Heslehurst N, Hall J, Schoenaker DAJM, Hutchinson J, Cade JE, et al. Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. Lancet. 2018;391(10132):1830-41. Erratum in: Lancet. 2018;391(10132):1774.
7. Ajantha, Singh AK, Malhotra B, Mohan SK, Joshi A. Evaluation of dietary choices, preferences, knowledge and related practices among pregnant women living in an Indian setting. J Clin Diagn Res. 2015;9(8):LC04-10.
8. Ghosh-Jerath S, Devasenapathy N, Singh A, Shankar A, Zodpey S. Ante natal care (ANC) utilization, dietary practices and nutritional outcomes in pregnant and recently delivered women in urban slums of Delhi, India: an exploratory cross-sectional study. Reprod Health. 2015;12:20.
9. Marshall NE, Abrams B, Barbour LA, Catalano P, Christian P, Friedman JE, et al. The importance of nutrition in pregnancy and lactation: lifelong consequences. Am J Obstet Gynecol. 2022;226(5):607-32.
10. Abu-Baker NN, Abusbaitan HA, Al-Ashram SA, Alshraifeen A. The effect of health education on dietary knowledge and practices of pregnant women in Jordan: a quasi-experimental study. Int J Womens Health. 2021;13:433-43.
11. Pandit P, Galande S, Iris F. Maternal malnutrition and anaemia in India: dysregulations leading to the

'thin-fat' phenotype in newborns. J Nutr Sci. 2021;10:e91.
12. Daba G, Beyene F, Fekadu H, Garoma W. Assessment of Knowledge of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia. J Nutr Food Sci. 2013;3:235.
13. Kraemer K, Beesabathuni K, Askari S, Khondker R, Khan TU, Rahman M, et al. Knowledge, attitudes and practices of pregnant women and healthcare providers in bangladesh regarding multivitamin supplements during pregnancy. Healthcare. 2023;11(5):713.
14. Aoyama T, Li D, Bay JL. Weight gain and nutrition during pregnancy: an analysis of clinical practice guidelines in the Asia-Pacific region. Nutrients. 2022;14(6):1288.

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