

Original Research

Received 20 April 2026

Revised 25 May 2026

Accepted 14 June 2026

Natural Resources for Human Health 2026, Vol. 6 (5): 561–574

KEYWORDS:

Dietary practices, Health promotion intervention, Pregnant women, Nutritional knowledge.

A Health Promotion Intervention to Improve Nutritional Knowledge and Dietary Practices among Pregnant Women: A Quasi-Experimental Study

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ABSTRACT: Research has demonstrated that nutrition education during pregnancy significantly affects pregnant women's eating habits as well as the outcomes for the mother and the unborn child. During each prenatal care visit, the World Health Organization (WHO) advises healthcare practitioners to provide pregnant women with appropriate, targeted, and accepted nutrition-related advice.

Aim: To determine the effect of a health promotion intervention to improve nutritional knowledge and dietary practices among pregnant women.

Design: To conduct this study, a Quasi-experimental research design pre-post-test was utilized.

Settings: The study was conducted at the antenatal clinics at Sohag University Hospitals.

Sample: A convenience sample of 300 pregnant women was recruited from the previously selected settings.

Tools: A structured interviewing questionnaire and pregnant women's reported dietary practices.

Results: The results showed that there was a highly statistically significant difference found between pregnant women's nutritional knowledge. Pre the health promotional intervention, more than three-quarters of pregnant women had unsatisfactory total dietary practice scores pre-intervention, which improved, and most of them had satisfactory total dietary practice scores post-intervention.

Conclusion: The health promotion intervention had a significant effect on improving pregnant women's nutritional knowledge and dietary practices during pregnancy.

Recommendation: Pregnant women should be informed about nutritional issues through health promotion programs during the prenatal stage to avoid consequences related to these issues.

1. INTRODUCTION

Many physical, physiological, hormonal, and anatomical changes occur during pregnancy, making it a crucial time in a woman's life that she must be supported. According to Eshra & Ali (1), pregnant women should eat a nutritious diet to support the growth and development of their fetus and prevent pregnancy-related problems.

Adequate and balanced nutrition intake has a significant impact on the results of a healthy pregnancy and delivery. The appropriate nutritional intake of pregnant women is significantly influenced by their knowledge and practice of nutrition. The best time and place to implement an intervention that could maximize pregnant women's and their unborn child's outcomes by encouraging them to make dietary changes seems to be during the prenatal period, when there are opportunities for frequent interaction with health experts (2).

A vital component of human life, nutrition is essential for growth and well-being at every stage of life, but especially during pregnancy. Pregnancy-related health for both the mother and the developing baby depends on a diet that is high in energy, rich in a range of nutrients, minerals, and vitamins, and that keeps the mother away from toxins and pollutants. Two 3 Preterm birth, anemia, unhealthy maternal weight gain, and low birthweight (LBW) babies—who grow and develop less well and have a worse chance of survival than normal birthweight babies—have all been linked to poor nutrition quality during pregnancy (3).

A healthy pregnancy and successful delivery have been linked to adequate and balanced nutrition during pregnancy, and their understanding and practice of nutrition play a major role in this. 5 8-10 Recognizing the importance of nutrition during pregnancy, the WHO advises antenatal care (ANC) practitioners to give their clients appropriate, targeted, and palatable nutrition-related advice at each antepartum visit. It is often known that education plays a significant role in promoting health. Although information is not behavior, it influences dietary behavior. Therefore, it seems that the prenatal period, when there are opportunities for frequent interaction with health experts, is the best time and place to implement the intervention that could encourage mothers to make changes that will maximize their results and those of the baby (4).

Micronutrient deficiencies and protein-energy undernutrition have been linked to baby and mother mortality, and Eritrea is no exception to the several nations that have these issues. 2% of women are shorter than 145 cm, the cut-off point at which a woman is considered to be at risk of giving birth to an LBW infant, according to the 2002 Eritrean Demographic Health Survey. Furthermore, 37% of women between the ages of 15 and 49 have a low body mass index, which suggests a chronic energy deficit. It is typical to see pregnant women eating less to prevent obese infants and, consequently, a difficult delivery (5).

Therefore, the goal of this study was to close the research gap on how teaching pregnant women about pregnancy-specific nutrition affects their proper nutritional knowledge and behavior. A healthy diet, optimal weight gain, and favorable child outcomes, such as a good birth weight, can all be attained by achieving enough knowledge and practice. The research will also be used as a starting point for studies and initiatives aimed at improving the nutritional status of pregnant women both domestically and internationally. This study's intervention, the antenatal training and nutrition education, and the materials utilized can all be replicated to fill the nutrition education gap in the region and the nation (6).

In pregnant women, iron deficiency anemia, underweight, gestational diabetes, overweight, and obesity are among the most common nutritional issues that can lead to serious pregnancy consequences. Nutritional deficiencies, illnesses, insufficient consumption of usable iron, excessive blood loss, and tea consumption following a big lunch can all contribute to iron deficiency anemia. Since vitamin C improves iron absorption, a low intake of foods high in this vitamin is another contributing factor. Iron deficiency anemia can be reduced primarily by increasing mothers' knowledge of the proper foods to consume during pregnancy, fortifying some staple meals with iron, and taking iron supplements (7).

At every prenatal appointment, health care providers should educate patients on nutrition, according to WHO recommendations. The beneficial impact of health education on pregnant women's eating practices and knowledge levels was supported by multiple studies. When 406 pregnant women in Ethiopia were studied to see how nutrition education affected their dietary knowledge and behaviors, for instance, it was discovered that their knowledge of healthy nutrition improved and their dietary practices improved (8)

Promoting health gives women more power over their personal well-being. In contrast to focusing solely on treatment and cure, it encompasses a wide variety of interventions intended to improve and safeguard women's health and quality of life by treating and preventing the underlying causes of illness. In order to preserve the health of expectant mothers and the results of their pregnancy, nutrition education, as a health promotion activity, can assist them in maintaining good behavioral patterns and managing other related health risk factors. Additionally, during each antepartum visit, the World Health Organization (WHO) advises healthcare practitioners to give their ANC clients appropriate and acceptable nutrition-related advice (9).

During their routine prenatal visits, obstetric nurses will have the unique opportunity to offer expectant patients dietary advice. One of the most crucial things that nurses do with expectant mothers is to promote and educate them about health, acting as advocates for their well-being rather than as disease managers (10).

Significance of the study:

A healthy, balanced diet is thought to be essential for all people to ensure the appropriate operation of their bodily systems. Pregnancy encompasses both the fetus's growth and development as well as the anticipated weight gain of the pregnant woman. Additionally, it can assist enhance neonatal and delivery outcomes and shield the child against later-life problems including obesity and heart disease. A balanced diet should include enough energy, protein, vitamins, and minerals from a variety of foods, according to the World Health Organization [WHO]. Poor nutrition during pregnancy causes miscarriage, premature birth, anemia, hypertension, increased maternal infections, and gestational weight gain (9).

Poor nutrition during pregnancy can result in low birth weight, intrauterine growth retardation, and neural tube abnormalities, among other negative fetal consequences. According to Alemayehu & Tesema (11), pregnant women who consume inadequate nutrition may also experience issues such as anemia, miscarriage, pregnancy-induced hypertension, gestational diabetes, and early or cesarean birth.

Pregnancy-related nutrition education: Adequate daily consumption of iron, folic acid, and other pregnancy-specific nutrients can be promoted by eating a nutritious diet during pregnancy. Programs for nutritional education can help pregnant women eat better by encouraging a balanced diet. Pregnant women's knowledge and eating habits are significantly impacted by nutrition education, according to the overwhelming body of data, which helps them to enhance their pregnancy and delivery outcomes (12). So, the study was done to determine the effect of health promotion intervention on improving nutritional knowledge and dietary practices among pregnant women.

Aim of the study

To determine the effect of health promotion intervention on improving nutritional knowledge and dietary practices among pregnant women

Research Hypotheses:

Health promotion intervention is expected to improve nutritional knowledge and dietary practices among pregnant women

2. MATERIALS AND METHODS

2.1 Study Material

Research design:

A pre-post-test quasi-experimental research design was used to conduct this study; this type of design is crucial to the nature of the research problem, as it involves observing one or more groups before and after modifications.

2.2 Sample Collection

Setting:

The study was conducted at the antenatal clinics at Sohag University Hospitals

Subjects

Within six months, a convenience sample of 300 pregnant women was gathered from the settings that had been previously chosen.

Tools of data collection:

The study's data was gathered using two instruments, which are as follows:

Tool I, a structured interviewing questionnaire, it was created by the Researchers which was divided into the following three parts:

Part (1) :Personal information on pregnant women, including age, education, occupation, and place of residence (8 and 9):
Part (2) included five questions about the gravida, abortion, and pregnancy stage. It asked about the obstetrical history of pregnant women.

Part 3: Nutritional Knowledge Assessment Tool for Pregnant Women (pre-post tool): This instrument, which included 20 nutritional knowledge items, was created by the researchers to determine the degree of nutritional knowledge and the sources of information of pregnant women.

Scoring system:

There were multiple-choice and "yes/no" questions regarding dietary issues. For every "yes/no" question, a zero denoted an erroneous response, while a one denoted a correct response. Additionally, there were three possible answers for the multiple-choice questions: 0 for "don't know," 1 for "incompletely correct," and 2 for "completely correct." For the 20 items, the overall knowledge score varied from 0 to 40. Knowledge was categorized as either satisfactory ($\geq 60\%$) or unsatisfactory ($\leq 60\%$).

Tool II, the Pregnant Women's Reported Dietary Practices (pre-post tool), was made up of two parts. The first part consisted of 10 questions designed to gauge the dietary habits of the expectant mothers. **System of scoring:**

"Yes/no" responses were included in the reported practices items, and the 10 items' combined score ranged from 0 to 11; a correct response received a score of 1, while an incorrect response received a score of 0. After calculating the sum of the scores for each item, the level of practice was categorized as inadequate dietary practices if the score was less than 60% and adequate dietary practices if the score was greater than 60%.

Validity and reliability of the tools:

Five professionals in the field of obstetrics and gynecology nursing evaluated the content validity and examined it for clarity, comprehensiveness, appropriateness, and relevance. No changes were made in accordance with the panel's ruling to guarantee that the material was appropriate and the phrases were clear. Cronbach's alpha test $\alpha = 0.89$, was used to evaluate the tool's dependability. Data collection procedure:

Three stages were involved in this study's methodology: the preparatory, implementation, and evaluation phases. Its purpose was to assess how a health promotion program affected pregnant women's knowledge and behavior about nutritional knowledge throughout pregnancy.

2.3 Extraction Procedure

A-Preparatory phase:

It was predicated on evaluation data gathered through learning, literature reviews, interview surveys, and nutritional habits and expertise. The booklet was created in Arabic and distributed following the implementation of the health promotion intervention.

Ethical considerations:

The scientific research ethics committees of Sohag University's nursing department provided ethical permission prior to the commencement of the study. To get their agreement and explain the study's goal, the researcher met with the nursing and medical directors of the chosen settings. The pregnant ladies gave their written consent to take part in the study.

following their explanation of the study's purpose. The pregnant women were advised by the researcher that participation in the study was entirely voluntary and that they might leave at any moment, for any reason. They were also given the assurance that the information they provided would remain private.

Pilot study

To evaluate the clarity and test the practicality of the research process to develop the final form of the tools, a pilot study was conducted on thirty pregnant women, or 10% of the sample. The study included pregnant women who participated in the pilot study. To make the instruments more suited to the perceptions of pregnant women, the researcher translated them into Arabic.

Implementation phase:

Sohag University Hospitals' prenatal clinic directories received a formal letter of authorization from the dean of the faculty of nursing. Beginning in August 2023 and ending in January 2024, data were gathered. From 9:00 a.m. to 11:00 a.m., the researcher spent two days a week in the previously chosen locations. After introducing themselves to the expectant mothers, the researcher collected data. The researcher talked with pregnant women about the purpose and nature of the study in a straightforward and understandable manner.

The questionnaire (Tool 1), which was used to evaluate pregnant women's nutritional knowledge and dietary practices, took about 30 to 40 minutes to complete for each woman. It took almost two hours for each session. After evaluating relevant literature, the researcher created a booklet with supporting information about pregnant women's nutritional knowledge and dietary patterns, which was distributed to all study participants.

The training room at the chosen locations was used to implement the created health promotion intervention. The intervention groups' clinics were visited ten times by the researchers, with each clinic receiving six teaching sessions. Pretest structured questionnaires were completed in a meeting room with the designated subgroup of 30 pregnant women at each visit. The group then heard a single instructive talk. After the talk, leaflets that supported the explanations were given out.

Initially, the researchers introduced themselves to expectant mothers. They fully explained the purpose of the study as well as the instrument they would be using to get the necessary data, which they translated into Arabic. The researcher invited all of the women to complete the pretest questionnaire and conducted a health promotion intervention in a meeting room at the chosen clinics and health facility.

Session 1: The content from the previous session was discussed by all researchers, followed by the learning objectives for the following session. During the discussion, the researcher used Arabic language that was suitable for women to grasp. Assess pregnant women's nutritional knowledge and eating habits first.

Session 2: The theoretical portion covered nutritional information for expectant mothers, including diet-related restrictions during pregnancy, the use of iodized salt, the duration of iron supplements and their food sources, the need for supplements in addition to regular foods, and the consumption of a variety of foods. The physiological changes that take place during pregnancy, the significance of nutrition and supplements for both the fetus and the pregnant woman, are a few more examples of the subjects discussed. It was put into practice with talks, posters, and genuine food sample demonstrations. educational films, scenarios, and role- plays.

Session 3: The practical section included details on how pregnant women's dietary habits might be improved and what they eat throughout pregnancy. Pregnant women's healthy eating habits: If a woman follows at least seven of the 11 recommended activities given below, she is said to be following adequate pregnancy-specific eating practices: 1, 2, 3, 4, 5, 6, 7, 8, 9. When she eats at least one more meal than she did when she wasn't pregnant, Consuming two to three servings of fish, meat, beans, or nuts, Two to three servings of dairy products (milk, eggs, yogurt, and cheese) Consuming two portions of green vegetables, one portion of a yellow vegetable, 3 servings of fruit were consumed. Eating three portions of high-complex carbs, such as whole grain breads or cereals, using iodized salt, follows her daily iron supplement regimen. abstains from smoking and alcohol consumption, 10. Reduces caffeine consumption compared to her pre-pregnancy levels, and 11. Does not completely avoid certain food categories throughout pregnancy. It was put into practice via lectures, posters, and instructional movies.

Session 4: The researchers described the significance of prenatal care visits, provided examples of the value of follow-up, and referred patients for serious issues and complication management. They also discussed how to prevent nutritional knowledge during pregnancy.

2.4 Analytical Methods

The Evaluation phase:

After implementing the health promotion intervention regarding nutritional knowledge and dietary practices among pregnant women during pregnancy, re-evaluation of the study sample's nutritional knowledge and dietary practices among pregnant

women was completed at the follow-up visit one month after the initial settings were chosen, using the identical format of the tool that was used in the pre-test to assess the impact of the health promotion intervention.

2.5 Statistical Analysis

The researchers examined, categorized, and then coded each questionnaire's content. Version 21 of the SPSS software was used to tabulate and analyze the data. For figures, Excel is utilized. Quantitative data were represented using means and standard deviations, whereas qualitative variables were presented as percentages and frequencies using descriptive statistics. Pregnant women's knowledge was measured before and after the program, and any changes were analyzed using the paired T-test. Pearson correlation analysis was performed to assess the correlations between quantitative variables.

3. RESULTS AND DISCUSSION

3.1 Preliminary Analysis

Table (1): Pregnant women's personal data (n=300)

Item	Pregnant women (300)	
	No.	%
Women ' age in years		
18 < 30	258	86
30 < 40	42	14
Mean ±Stander deviation	21.10 ± 7.58	
-Women's education		
- Illiterate	57	19
-Basic education	72	24
-Secondary education	123	41
-University education	48	16
Residence		
- Rural	234	78
- Urban	66	22
Occupation		
- Working	75	25
- Housewives	225	75

Table 1 showed that 86% of pregnant women were between the ages of 18 and 30. Their mean age was 20.9 ± 6.47 , and 41% of them had completed secondary school. It also showed that 70% of pregnant women were unemployed. It was shown that 22% of pregnant women were from cities, while 78% of them lived in rural areas.

Table (2): Pregnant women's obstetrical history (n=300)

Item	Pregnant women (300)	
	No.	%
Gravida		
- Primigravida	120	40
- Multigravida	144	48
- Grand Multigravida	36	12
Abortion		
- Less than 2	60	20
- More than 2	36	12
- No abortion	174	58
Pregnancy stage		
- First Trimester	177	59.0
- Second Trimester	123	41.0

Table 2 indicates that 49% of the pregnant women were in the first trimester, 58% had never had an abortion, and 48% were multigravida.

3.2 Instrumental Analysis

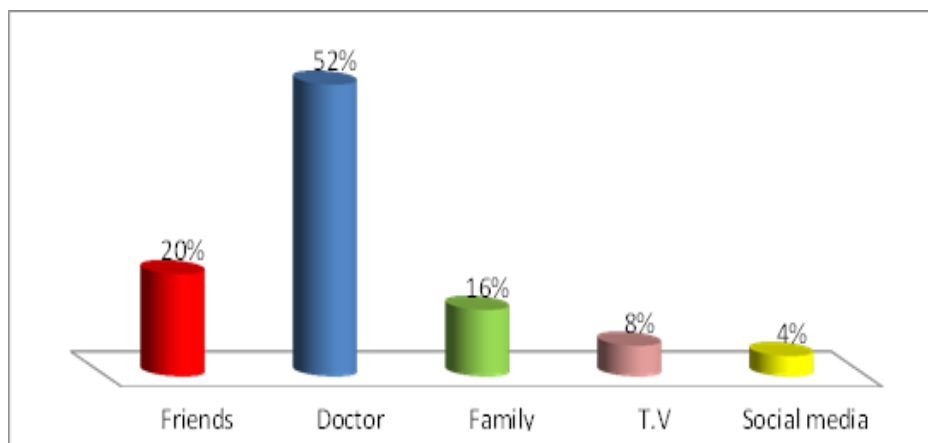


Figure (1): Pregnant women's source of nutritional knowledge and dietary practices among pregnant women (n=300)

Doctors were the primary information source for 52% of the pregnant women in the study, as seen in **figure (1)**.

Table (3): Total Mean Scores' pregnant women nutritional knowledge pre and post-health promotion intervention (n=300)

Items	Pre-health promotion intervention	Post- health promotion intervention	t-test	P-value
Total knowledge level	8.3± 1.2	18.2 ± 1.4	45.12	0.001**

****Highly statistically significant differences**

Table (3) showed that pregnant women's nutritional knowledge before and after the health promotion intervention differed in a highly statistically significant way ($p < 0.001^{**}$).

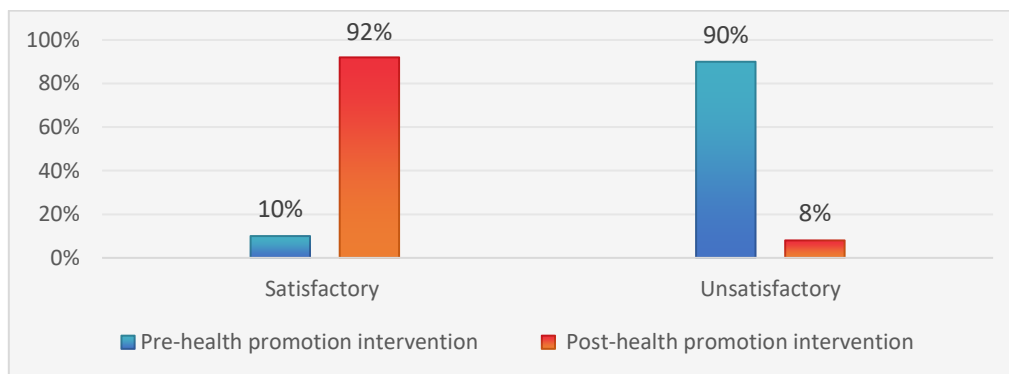


Figure (2): Total pregnant women's nutritional knowledge level pre and post-health promotion intervention (n=300).

Figure 2 demonstrated how pregnant women's overall level of nutritional knowledge improved both before and after the health promotion intervention. Before the implementation of the health promotion intervention, 90% of pregnant women had an unsatisfactory level of overall nutritional knowledge; after the intervention, 92% of them had a satisfactory level of overall nutritional knowledge.

Table (3): Mean differences of the studied pregnant women nutritional knowledge pre and post health promotion intervention (n=300).

Variable	Pre-health promotion intervention	Post-health promotion intervention	Paired t-test	P-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Nutritional knowledge	1.47 $\pm$ 0.48	4.62 $\pm$ 1.37	45.8	<0.001**

Table (3) made it clear that the dietary practice of pregnant women before and after the health promotion intervention differed in a highly statistically significant way ($p < 0.001^{**}$).

Table (4): Mean differences of the studied pregnant women dietary practices pre and post health promotion intervention (n=300).

Variable	Pre-health promotion intervention	Post-health promotion intervention	Paired t-test	P-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Dietary practices	5.56 $\pm$.46	9.43 $\pm$.55	19.2	<0.001**

Table (4) made it clear that the dietary practice of pregnant women before and after the health promotion intervention differed in a highly statistically significant way ($p < 0.001^{**}$).

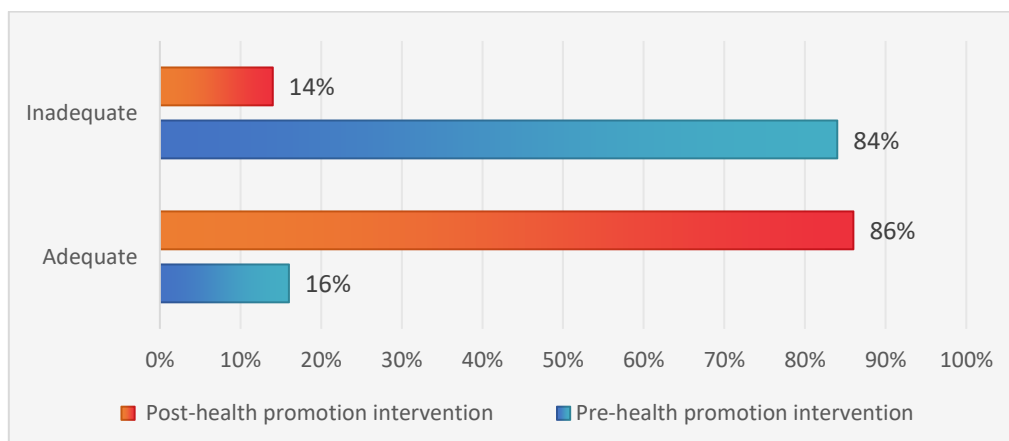


Figure (3): Total pregnant women dietary practices level pre and post-health promotion intervention (n=300).

Figure 4 illustrates that 84% of pregnant women had inadequate levels of total dietary practice prior to the implementation of a health promotion intervention. After the intervention, 86% of them had adequate levels of total dietary practice.

3.3 Biological Activity

Table 5: The correlation between the pregnant women's nutritional knowledge, dietary practices, and personal data (n= 300).

Items		Knowledge	Practice
Age	R	-.122-	-.109-
	P – value	.342	.453
Educational level	R	-.555	.026
	P – value	.001**	.849
Occupation	R	.080	-.347
	P – value	.611	.016*
Residence	R	.048	-.256
	P – value	.732	.024*

**. Correlation is significant at the 0.01 level

According to **Table (5)**, there was a moderate correlation between the pregnant women's knowledge and education level (P value<0.001), as well as between their residence and degree of practices (P value<0.001).

Table (6): Correlation between total pregnant women's nutritional knowledge and dietary practice pre- and post-health promotion intervention (n= 300).

Items	Variables		Pre- health promotion intervention	Post -health promotion intervention
			Knowledge	Knowledge
Pre-educational guidelines	Practice	R	-0.102	0.015
		P – value	0.465	0.944

Items	Variables		Pre- health promotion intervention	Post -health promotion intervention
			Knowledge	Knowledge
Post - educational guidelines	Practice	R	0.188	-0.549
		P – value	0.547	0.014*

*. Correlation is significant at the 0.05 level

Table (6) shows a moderate correlation between the pregnant women's knowledge and practices after the health promotion intervention.

3.4 Discussion

Pregnancy-related improvements in behavior, attitude, and knowledge are crucial because they affect the mother's and her unborn child's quality of life after giving birth. Therefore, the goal of the study was to determine the effect of a health promotion intervention to improve nutritional knowledge and dietary practices among pregnant women.

According to the current study's findings, over half of the pregnant women in the study primarily obtained their knowledge from doctors. This finding demonstrated how critical it is for healthcare professionals to enhance nutrition education in order to give expectant mothers the knowledge they need to avoid the complications of nutrition issues during pregnancy. These findings were in line with those of Zahara et al. (13), who investigated the "Nutritional Status and Nutritional Knowledge of Malay Pregnant Women in Selected Private Hospitals in Klang Valley" and found that the pregnant women sought information from the study's healthcare providers.

This finding is consistent with other studies by Arrish et al., (14); In another Knowledge, Attitude, and Practice Survey, doctors were identified as the primary sources of information (15). These results contrast with other studies, including a recent Ethiopian study, which did not favor health professionals as the best source of information (7).

According to the current study's findings, pregnant women's nutritional knowledge improved both before and after participating in a health promotion intervention. This finding demonstrated the beneficial effects of the intervention and linked the benefits of dietary promotion to pregnant women's increased awareness throughout pregnancy. The findings of this study surpassed those of a study conducted by Gambia (16), which reported that only one-third of participants received nutritional and dietary information from their health providers. This lack of knowledge can be attributed to limited access to information, highlighting the need for audience-specific education and promotion of iron usage.

A similar quasi-experimental study conducted by Fallah et al. (17) in Iran also indicated that the awareness level of pregnant women regarding healthy nutrition significantly increased from 3% before the intervention to 31% following the nutritional education intervention. These similarities underscore the effectiveness of intervention in enhancing the knowledge of pregnant women.

Also, findings align with a study conducted in America, by Zahara et al.,(13) where over half of the women surveyed had fundamental and essential knowledge regarding the significance of nutrition during pregnancy. However, this result is lower than findings from Malaysia, where the majority of mothers demonstrated appropriate knowledge concerning maternal nutrition (18), (19).

This pattern is quite similar to Zepro (20), who stated that the food avoidance reported by pregnant women in Shashamane, Ethiopia. Following the implementation of nutrition education in this study, the percentage of pregnant women possessing good knowledge of nutrition during pregnancy rose. These findings suggest the effectiveness of nutrition education in enhancing the nutritional knowledge of pregnant women.

Similarly, findings are consistent with those of Farnoush et al. (21), who found that pregnancy-related nutrition knowledge increased following the introduction of nutritional education for expectant mothers. Also, findings were made by Garg & Kashyap (22) in India, who discovered that participants' pre- and post-assessment nutritional knowledge had improved.

According to the results of the study, the results of the current study demonstrated how pregnant women's overall level of nutritional knowledge improved both before and after the health promotion intervention. From the researchers' point of views, it reflected the success of health promotion intervention.

According to the results of the study, pregnant women's dietary practice of pregnant women before and after the health promotion intervention differed in a highly statistically significant way. From the researchers' point of views, this demonstrates the impact of health promotion intervention on pregnant women's dietary practice. also, it confirmed the desire of the studied pregnant women to enhance their knowledge that associated with improving their dietary practice.

In a similar vein, a Swaziland study found that 51% of expectant mothers followed healthy eating habits (18). At the same time, another study in Malaysia found that a greater percentage of pregnant women followed healthy eating habits (13). These findings imply how well nutrition education works to improve pregnant women's nutritional practices and understanding. Both the short time between the pre and post assessments and the single after-education evaluation may have contributed to the study's notable improvement in pregnant women's dietary knowledge and behaviors.

The American Study Widen & Siega-Riz (23), in contrast to this one, found that over three-fifths of participants regularly ate fresh vegetables. These disparities could be explained by the two communities' different eating customs and levels of awareness. In this study, the main causes of avoiding food groups were feeling queasy or throwing up after eating the food. Consistent with the results of this investigation, earlier studies also revealed comparable patterns. The utilization of comparable intervention techniques, supplementation, and one-on-one instruction regarding iron supplementation may be the reason for the similarities in these results. Among the study's subjects.

Before the implementation of the health promotion intervention, over three-quarters of pregnant women had an inadequate total dietary practice level. However, after the program was implemented, the majority of them had adequate total dietary practice scores.

In a study among pregnant women in Addis Ababa, Zelalem et al. (7) stated that it is crucial to expose pregnant women to prenatal health education in order to motivate them to adopt better practices. This outcome is also consistent with a report by Desalegn et al.(24), which found that there was a notable improvement in food practices following nutrition education compared to before.

The results of this study showed that pregnant women's nutritional knowledge and dietary practices were correlated before and after the implementation of a health promotion program. This is explained by the fact that satisfying practices are always linked to adequate information.

The results of this study showed that there was a statistically significant difference and that pregnant women's lack of knowledge may be related to their young age and low educational attainment.

All of the current study's findings demonstrated that the health promotion program hypothesis had a positive effect and was successful in enhancing pregnant women's knowledge and practices about nutritional issues during pregnancy. Fallah et al.(18) conducted a study in Western Iran and found that health education was successful in raising the study sample's dietary knowledge and practices, which supports these findings and hypotheses.

Additionally, the findings of the Brazilian study by Oliveira et al. (25), which showed a notable change in dietary knowledge and practices, corroborate the findings of this study after providing health education. These findings also supported a study by Ashenafi et al. (26), who demonstrated improvements in pregnant women's knowledge and practices following nutrition education. Pregnant women benefited from improved, high-quality prenatal care and services, which demonstrated the significant impact that Community-Based Health Planning and Services had in expanding access to and enhancing prenatal care (27).

There was a moderate correlation between the pregnant women's knowledge and education level as well as between their residence and degree of practices, and their nutritional knowledge that arises during pregnancy. In terms of education, health literacy and the extent to which women can access and comprehend basic health information are associated to knowledge deficits (28).

According to Kululanga et al. (29), these findings are consistent with their study who determined that the implemented health promotion intervention had a positive influence on pregnant women's knowledge and dietary practices addressing the dietary

concerns during pregnancy, based on the findings of the current study and research questions. After the oral health promotion intervention was put into place, the majority of pregnant women showed better levels of knowledge and practice, as well as satisfied practices.

The current study's findings were consistent with those of prior studies (24) that showed that educational interventions enhance pregnant women's knowledge. However, due to methodological differences, including various teaching approaches. Studies show that people know more about the prerequisites for healthy behavior, and that increased knowledge appears to be important for the occurrence of suitable health behaviors (30).

4. CONCLUSION

It was determined based on the current study's findings that the health promotion intervention had a significant effect on improving pregnant women's nutritional knowledge and dietary practices during pregnancy.

Recommendation:

The recommendations listed below were proposed in light of the results of the current study:

- Pregnant women should be informed about nutritional issues through health promotion programs during the prenatal stage in order to avoid consequences related to these issues.
- It is recommended that pregnant women read the educational brochure regarding dietary issues during pregnancy.

The correction of nutritional misconceptions that are frequently prevalent among community pregnant mothers.

ACKNOWLEDGEMENTS

The authors acknowledge the support of Prince Sattam Bin Abdulaziz University for funding this study (Project Number: PSAU/2025/R/1447).

AUTHOR CONTRIBUTIONS:

Elsayed Hamdy Nasr Abdelhalim: Conceptualization, Investigation, Methodology, Laboratory Analysis, Data Curation, Formal Analysis, and Supervision, Writing—Review & Editing.

CONFLICT OF INTEREST

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ETHICS STATEMENT

The scientific research ethics committees of Sohag University's nursing department provided ethical permission prior to the commencement of the study. To get their agreement and explain the study's goal, the researcher met with the nursing and medical directors of the chosen settings. The pregnant ladies gave their written consent to take part in the study.

DATA AVAILABILITY STATEMENT

Upon request for scientific purposes, the researcher of correspondence will provide researchable Information about the research.

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