

Effectiveness of an Educational Program in Improving Knowledge of Pregnancy Danger Signs among Primigravida Women

Educational Program in Improving Knowledge of Pregnancy Danger Signs

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ABSTRACT

Objective: To assess effectiveness of an educational program in improving knowledge of pregnancy danger signs among primigravida women.

Study Design: A quasi-experimental study

Place and Duration of Study: This study was conducted at the Primary Health Care Centers, Governorate of Karbala, Iraq from 1st September 2024 to 31st January 2025.

Methods: A quasi-experimental study was conducted at Primary Health Care Centers, Governorate of Karbala, Iraq and 98 first time pregnant mothers were enrolled.

Results: There were big improvements in post-test 69.4% as good knowledge in contrast 100% of the participants have a poor level of knowledge in pre-test stage. The high education, employed and high economic status tend to high knowledge levels ($P < 0.05$) while in post-test knowledge, no significant ($P > 0.05$) association between total knowledge score (post-test stage) and socio-demographic variables.

Conclusion: A well program of teaching can be an equally effective and more equitable intervention to improve the overall level of knowledge toward the warning signs of pregnancy in the first-time pregnant woman. Integrating evidence-based education into routine antenatal care for first-time pregnant women can promote timely care-seeking and reduce preventable maternal complications.

Key Words: Primigravida, Danger signs, Maternal, Knowledge, Obstetrics

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INTRODUCTION

The state of being pregnant is characterized by increased physical stress and demands for energy. The mother's body undergoes many changes as it adapts to support the growing baby and placenta. In order for health care providers to recognize any medical problems that may arise during pregnancy, they must first learn how to identify what is normal for a woman who is expectantly pregnant. By knowing these changes, providers will have an easier time identifying medical problems when they occur.¹

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Other physiological changes that occur throughout the entire course of pregnancy, from conception through the postpartum period, affect the mother's anatomy and physiology to meet the mother's changing metabolic and physical needs in order to nourish the growing fetus. In addition to affecting how the fetus grows and develops, some of these changes can also contribute to pregnancy-related complications such as preeclampsia, postpartum cardiomyopathy, and perhaps postpartum depression.²

Danger signs during pregnancy indicate that a serious complication has developed either in the mother or the fetus which is at risk of resulting in adverse health effects or even death to the mother or fetus at the time of delivery or within the initial hours after delivery.³

Pregnancy, childbirth, and postpartum have many symptoms - the severe vaginal bleeding, swollen hands or faces, blurry vision, severe abdominal pain, leaking fluid from the vagina, cramps, pelvic pressure, backache, nausea, headaches, burning or pain with peeing, decreased fetal movement, a long time in labor, convulsions, a retained placenta (where the placenta stays inside after delivery), being unconscious, and feeling very weak - that a woman and her healthcare provider should know about so they can quickly diagnose any life-threatening issues.⁴

Maternal mortality remains a serious burden in most of the developing countries such as Iraq and hence, change towards Millennium Development Goal (MDG) five has been specifically overlooked. The mortality ratio of motherhood in developing countries is 15 times higher than in developed countries.⁵ The first step to the proper and timely referral to the basic and necessary obstetric care is the knowledge of danger signs of obstetric complications.⁶

Limited knowledge on the signs of obstetric danger leads to delays in seeking and getting skilled care⁷, and the recognition of danger signs early is highly relevant to prevent delay in decision seeking to get healthcare.⁸ Although the level of health-seeking action was low in the developing countries, over three-fourths of the women were now undertaking suitable health-seeking action following the warning signs in their pregnancy.^{9,10}

This study performed in an Iraqi setting will give locally specific evidence of whether the knowledge of the primigravida women on the signs of pregnancy danger can be increased by the use of an educational program. It is hoped that the findings will enlighten the healthcare providers, planners, and policymakers about the importance of incorporating the educational interventions that are specifically chosen into regular antenatal care services. In the long-term, this would help to increase maternal awareness, prompt care-seeking, complications and maternal and neonatal health outcomes in Iraq. The hypothesis was the knowledge of primigravida women regarding pregnancy danger signs will greatly increase after the intervention through a structured educational program compared to the knowledge of these women before the intervention. Increasing awareness and knowledge of the most important warning signs is likely to make the program result in the timely health-seeking behavior and help to prevent avoidable maternal complications.

METHODS

A one-group pre-test/post-test quasi-experimental study was conducted at six Primary Health Care Centers (Al-Nasr, Al-Tahadi, Al-Malhaq, Al-Wafaa, Al-Iskan, and Al-Muwazafeen) in Karbala, Iraq, from September 1, 2024, to January 31, 2025 vide letter No. 3434/QM/Approval/JSDJNEHU dated August 6, 2024. A total of 98 primigravida women were recruited through purposive sampling. Women receiving antenatal care at the study centers who provided written informed consent were included, while those who declined participation or withdrew after the intervention were excluded.

Data were collected through face-to-face interviews using a two-part questionnaire covering sociodemographic characteristics and 43 knowledge items related to major pregnancy danger signs, including vaginal bleeding, headache, seizures, severe abdominal pain, fever, edema, reduced fetal movement,

and sickness, fatigue, or exhaustion. Correct responses were scored 1 and incorrect responses 0, giving a maximum score of 43. Knowledge was classified as poor (<22; <50%), moderate (22–32; 50%–<75%), or good (≥33; ≥75%). The questionnaire demonstrated high internal consistency (Cronbach's $\alpha=0.935$).¹¹

The study comprised assessment, implementation, and evaluation phases. Baseline sociodemographic and knowledge data were obtained before the intervention. Participants then received a single structured educational session based on Iraqi Ministry of Health guidance, delivered through interactive lectures, group discussions, flipcharts, and demonstrations. An immediate post-test was subsequently administered to assess changes in knowledge.

Data were analyzed using SPSS version 27. Pre- and post-test mean knowledge scores were compared using paired t-tests, while multiple linear regression was used to assess associations between sociodemographic characteristics and total knowledge scores. A P-value ≤0.05 was considered statistically significant.

RESULTS

Table No. 1: Sociodemographic characteristics of pregnant women (n=98)

Variables	No.	%
Age (years)		
16-20	36	36.7
21-25	40	40.8
26-30	17	17.3
31-35	5	5.1
Level of Education		
Unable to read and write	13	13.3
Read and write	8	8.2
Primary school	32	32.7
Intermediate school	5	5.1
Secondary school	19	19.4
University and above	21	21.4
Occupation status		
Housewife	58	59.2
Student	18	18.4
Employed	22	22.4
Economic status		
Insufficient	29	29.6
Sufficient to some extent	56	57.1
Sufficient	13	13.3
Residency		
Rural	46	46.9
Urban	52	53.1
Trimester of current pregnancy		
First trimester	53	54.1
Second trimester	35	35.7
Third trimester	10	10.2
Do you currently receive regular prenatal care visits		
Yes	93	94.9
No	5	5.1

Most participants were aged 21–25 years (40.8%), had primary-level education (32.7%), were housewives (59.2%), reported partially sufficient income (57.1%), lived in urban areas (53.1%), and were in the first trimester (54.1%). Regular prenatal care was reported by 94.9% of participants (Table 1).

Knowledge scores improved significantly after the educational intervention across all assessed domains ($P < 0.05$) (Table 2). Before the intervention, all participants had poor knowledge; after the intervention,

69.4% had good knowledge and 30.6% had moderate knowledge (Table 3).

On multivariable analysis, higher education ($\beta = 0.269$, $P = 0.007$), employment ($\beta = 0.393$, $P < 0.001$), and higher economic status ($\beta = 0.285$, $P = 0.004$) were significantly associated with greater pre-test knowledge. Age, residence, trimester, and regular prenatal care were not significant predictors (Table 4). No sociodemographic variable was significantly associated with post-test knowledge scores ($P > 0.05$) (Table 5).

Table No. 2: Comparison of mean scores between knowledge domains for pre- and post the test

Knowledge domains	Pre-test		Post-test		P-value
	Mean $\pm$ SD	Ass.	Mean $\pm$ SD	Ass.	
Vaginal Bleeding	0.53 $\pm$ 0.30	Moderate	0.90 $\pm$ 0.08	Good	0.008
Headache	0.50 $\pm$ 0.39	Moderate	0.79 $\pm$ 0.21	Good	0.012
Seizures (epilepsy)	0.27 $\pm$ 0.26	Poor	0.83 $\pm$ 0.12	Good	0.006
Severe abdominal pain	0.50 $\pm$ 0.35	Moderate	0.90 $\pm$ 0.10	Good	0.049
Fever	0.26 $\pm$ 0.24	Poor	0.85 $\pm$ 0.12	Good	<0.001
Edema (swelling)	0.07 $\pm$ 0.14	Poor	0.69 $\pm$ 0.15	Moderate	<0.001
Low Fetal Movement	0.31 $\pm$ 0.30	Poor	0.86 $\pm$ 0.21	Good	0.007
Feeling sick, tired and exhausted during pregnancy	0.49 $\pm$ 0.41	Poor	0.86 $\pm$ 0.17	Good	0.020
The overall knowledge	0.37 $\pm$ 0.16	Poor	0.84 $\pm$ 0.07	Good	<0.001

Mean score: Poor <50% (<0.5 mean score), Moderate 50%–<75% (0.5–<0.75 mean score), and Good $\geq$ 75% ($\geq$ 0.75 mean score)

Table No. 3: The distribution of the primigravida according to levels of knowledge

Knowledge Level	Pre-test		Post-test	
	No.	%	No.	%
Poor (<22 score)	98	100.0	-	-
Moderate (22–<33 score)	-	-	30	30.6
Good ($\geq$ 33 score)	-	-	68	69.4

Table No. 4: Multiple linear regression to identify the association between total knowledge score (pre-test stage) and socio-demographic variables

Model	Unstandardized coefficients		Standardized Coefficients	t	P-value	95.0% Confidence Interval for B	
	B	SE	Beta			Lower Bound	Upper Bound
Age (Older age)	0.101	0.072	0.140	1.389	0.168	-0.043	0.245
Level of Education (high education)	0.446	0.163	0.269	2.735	0.007	0.122	0.769
Occupation status (Employed)	1.329	0.317	0.393	4.192	<0.001	0.700	1.958
Economic Status (high)	1.252	0.430	0.285	2.910	0.004	0.398	2.107
Residency (Urban)	-0.781	0.565	-0.140	-3.383	0.170	-1.902	0.340
Trimester of Current Pregnancy (third)	-0.637	0.419	-0.153	-1.521	0.132	-1.469	0.195
Do you currently receive regular prenatal care visits	-1.075	1.289	-0.085	-0.834	0.406	-3.633	1.483

Table No. 5: Multiple linear regression to identify the association between total knowledge score (post-test stage) and socio-demographic variables

Model	Unstandardized coefficients		Standardized Coefficients	t	P-value	95.0% Confidence Interval for B	
	B	SE	Beta			Lower Bound	Upper Bound
Age (Older age)	0.636	0.533	0.121	1.193	0.236	-0.422	1.694
Level of Education (high education)	0.014	0.274	0.005	0.050	0.960	-0.530	0.558
Occupation status (Employed)	0.009	0.558	0.002	0.016	0.987	-1.099	1.117
Economic Status (high)	-0.050	0.727	-0.007	-0.068	0.946	-1.493	1.393
Residency (Urban)	-0.395	0.923	-0.044	-0.428	0.670	-2.226	1.437

Trimester of Current Pregnancy (third)	0.130	0.687	0.019	0.189	0.850	-1.233	1.493
Do you currently receive regular prenatal care visits	0.340	2.094	0.017	0.162	0.871	-3.817	4.497

DISCUSSION

The current study revealed an improvement in the level of knowledge after the educational program about danger signs during pregnancy. This result agreed with the study findings conducted in Saudia Arabia¹² which found that the increase in the knowledge about birth preparedness and pregnancy outcomes in women was highly statistically significant between preprogram and after program. In Indonesia, maternal class education is a key factor in enhancing the capacity of pregnant women to recognize early signs of danger in the carrying of the pregnancy.¹³ The notable improvement in the post-intervention scores with the help of Wilcoxon test result ($p = 0.003$) proves that the educational sessions are effective in improving the maternal knowledge and vigilance.

In Uganda, Lee et al¹⁴ reported that all items of knowledge were better after the educational program. Also, another study in Indonesia found that there was improvement in post-test knowledge about danger signs compared to pre-test knowledge.¹⁵ In Egypt, health teaching sessions do have an effect on enhancing the knowledge of women about danger signals during pregnancy.¹⁶

The current study showed that that the level of knowledge increased after the educational program is possibly due to the formality and concentration of the intervention, which presented clear and evidence-based pieces of information about danger signs of pregnancy clearly and understandably. Interactive teaching approaches and straightforward explanations must have promoted the attention, understanding and memory of the key concepts in the participants. Besides, the presentation of the program in form of the antenatal visits formed a suitable learning environment, since the information was directly associated to the current experiences in the lives of the women, enhancing motivation and interest to attend the sessions. Recall might also be reinforced by the use of immediate content reinforcement by post-testing. Moreover, the primigravida women are generally unprepared in terms of previous information, so they are more open to new information, and hence such gains can be significant after specific education.

In pre-test knowledge, the results indicated that the participants have high education, and employed, and high economic status tend to high knowledge levels at significantly level less than 0.05. The results were consistent with different countries revealed maternal and husband education level, occupation, family size, and family income were some of the predictors of mothers' knowledge of obstetrics danger signs of pregnancy¹⁷⁻²⁰ This substantial correlation between greater pre-test knowledge and the level of education,

employment, and economic status of participants ($P < 0.05$) is potentially explained by the better access to health information, resources, and healthcare services by those groups. More educated women have more chances to know the information about health and seek knowledge about pregnancy and work-related women may have more access to health education because of their employment and more social contacts. The increased economic status will facilitate easier access to antenatal care, educational resources, and online information channels that will collectively improve the perception of the signs of pregnancy danger. These have been associated with a better level of knowledge after the educational intervention which can be seen as the part of socioeconomic determinants in determining the level of maternal health awareness.

After intervention, the current outcomes revealed that the difference between total knowledge score and socio-demographic variables did not show any statistical significance ($P > 0.05$). The findings are consistent with the findings carried out in India²¹, the research was on the knowledge level on childbirth among the primigravida mothers who visited the antenatal outpatient unit of one of the chosen hospitals in Bhopal. They discovered that knowledge and socio-demographic features of the studied sample did not have any statistically significant relationship. From our point of view, the fact that the differences between post-test scores of total knowledge and sociodemographic variables ($P > 0.05$) do not demonstrate significant differences may suggest that the program was equally efficient in all groups of participants, irrespective of their age, education, occupation, economical status, and residency. The educational session was structured and standardized, which also contributed to the similarity of the information offered to all primigravida women, and this situation reduced the differences in the baseline and produced similar knowledge gains.

CONCLUSION

A well-designed program of teaching can be an equally effective and more equitable intervention to improve the overall level of knowledge toward the warning signs of pregnancy in the first-time pregnant woman. Integrating evidence-based education into routine antenatal care for first-time pregnant women can promote timely care-seeking and reduce preventable maternal complications.

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