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Original Research Article

Effectiveness of goal oriented prenatal education on birth preparedness and complication readiness among antenatal mothers in selected community areas

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ABSTRACT

Background: High maternal mortality has been associated with inadequate Birth Preparedness and Complication Readiness (BPACR) and non-institutional delivery in developing countries. Therefore, there is a need for proven interventions that will improve BPACR and institutional delivery to reduce maternal mortality. This study evaluated the effects of Goal-Oriented Prenatal Education (GOPE) on pregnant women's BPACR and institutional delivery. The objectives of the study were to assess and evaluate the effectiveness of GOPE regarding BPACR by comparing mean pre and post scores of experimental and control groups. Find out the association between post-test GOPE score regarding BPACR among antenatal mothers with selected demographic variables.
Methods: This was a community based pre-test and post-test interventional study (quasi-experimental research design) and was conducted in two randomly selected community areas. A total of 60 antenatal mothers were selected by using purposive sampling technique. Data was collected by socio demographic variables, self-structured questionnaire.
Results: In experimental group pre-test mean knowledge score was 14.23 and post-test was 20.70. Whereas in control group the pre-test mean knowledge score was 15.00 and post-test was 15.60. As result showed that 't' value 8.21 p=0.00* level which indicates significance at <0.05 level. Hence research hypothesis was accepted that it was proclaimed that the GOPE had definite impact on increasing in the level of knowledge score regarding BPACR among antenatal mothers in both groups.
Conclusions: GOPE was effective to increase in knowledge score regarding BPACR.

Keywords: Effectiveness, GOPE, Birth preparedness, Complication readiness

INTRODUCTION

Pregnancy is a joyful and best moment for all mothers who dream for a safe pregnancy and a healthy baby. However, every pregnant woman faces the jeopardy of sudden, unpredictable complications that could end in death or injury to mother or to baby. But, just knowing baby is growing inside is one of the most rewarding experiences a woman can enjoy.[1] Almost all the maternal deaths (99%) occur in developing countries and 30% of them occur in North Asia.[2] In India, current maternal mortality ratio (MMR) is 97/100,000 live births, and still more efforts are needed to achieve Sustainable Development Goal (SDG) 3, target 1 of 70/100,000 live births.[3,4] Birth Preparedness and Complication Readiness (BPACR) is one of the key interventions to reduce the maternal mortality. The World

Health Organization recommend that pregnant woman should receive focused "antenatal care" in which BPACR is a key component.[2,5] A set of indices has been established by Johns Hopkins Program for International education in gynaecology and obstetrics (JHPIEGO) (an affiliate of Johns Hopkins University, USA) to measure BPACR at different levels - individual, family, community, health-care provider, facility, and policy levels. Maternal mortality has been an issue of concern in India for many years, and one of the countries endless endeavours has been to improve maternal health and bring down Maternal Mortality Ratio (MMR). Maternal death can be caused directly by postpartum haemorrhage, pre-eclampsia and hypertensive disorders, and complications of unsafe abortion, as well as indirectly by pre-existing medical conditions aggravate by the pregnancy.[6] BPACR is important aspect to ensure that timely skilled maternity and neonatal care is to be provided during delivery process. It is based on the concept that delays in getting necessary medical care can be considerably affect the labour and this can be reduced by preparing and handling birthing related complications.[7]

BPACR include many elements, including: (a) registration of pregnancy, (b) knowledge of danger signs, (c) plan for where to give birth, (d) plan for a skilled birth attendant, (e) plan for transportation, (f) a birth companion, and (g) identification of compatible blood donors in case of emergency. The World Health Organization states that a crucial element of targeted prenatal care needs to be BPACR Provide guidance on identifying the start of labor.[8] The purpose of BPACR is to enable expectant mothers and their families to get over the delays that frequently result in fatal consequences because timely care is not received.[9] BPACR is made up of the expectant mother and her family enthusiastically planning and making decisions on choosing a medical facility and a trained birth attendant, setting up money for emergencies, and arranging for transportation. Finding appropriate blood donors, setting up the things you need, finding a birth companion, and being aware of warning indicators.[10]

A cross sectional study on knowledge and practice about BPACR among primigravida women in Howrah District. In this study 200 primigravida mothers was taken and data collected by semi- structure questionnaire and checklist with non- probability convenience sampling technique was used. The findings of this study revealed that out of 200 pregnant women majority (31%) primigravidae mothers had sufficient knowledge regarding BPACR, whereas (69%) shown inadequate knowledge on BPACR. It was concluded that the BPACR knowledge and practice of participants were inadequate. Ideal BPACR given through education can help in healthy practice during antenatal and postnatal period.[8]

There is evidence that encouraging BPACR enhances preventative behaviors, improves mothers' awareness of danger indicators, and improves care seeking during obstetric emergencies from rural Nepal, Burkina Faso, Ethiopia, and India.[11-15]

The objectives of the study were to assess the pre-test and post-test GOPE scores regarding BPACR among antenatal mothers. To evaluate the effectiveness of GOPE scores regarding Birth Preparedness and Complication Readiness by comparing mean pre and post scores of experimental and control groups. To find out the association between post-tests GOPE scores regarding BPACR among antenatal mothers with selected demographic variables.

METHODS

To achieve the desired objectives, a quasi-experimental research design was adopted with quantitative research approach. Study was conducted in rural community areas (Sultanpur and Laddo village). Data was collected in the month of June 2024 to July 2024. Data was collected from 60 antenatal mothers by using purposive sampling technique. The following inclusion criteria were used to determine participation in the study: 1) willing to participate and present at the time of data collection 2) at ≥32 weeks of pregnancy 3) with or without high risk pregnancy 4) knows Hindi and English. Data was collected by socio-demographic variables: it includes age, marital status, occupation of mother, occupation of husband, types of family, religion, education status of mother, education status of husband, monthly family income (in rupees), gestational age in weeks, frequency of antenatal visit, ever had termination of pregnancy. Self-structured BPACR questionnaire tool: multiple-choice questions comprised all 30 test items. Every right response received one point, while every wrong response received zero. Thus the minimum score was 0 and maximum score was 30 and BPACR score were divided into four categories. The reliability of self-structured knowledge questionnaire tool was tested by Karl Pearson's correlation coefficient which is 0.98. Ethical permission taken from the information ethical committee of university (IEC). The data was analysed in accordance with the study's objectives, using descriptive and inferential statistics such as mean, t test and chi-square test.

Table 1: Level of BPACR knowledge score.

S. no.	Level of BPACR knowledge	Percentage	Range of score
1	Very good	>75	23-30
2	Good	61-75	19-22
3	Average	50-60	15-18
4	Below average	<50	0-14

Data collection

A structured questionnaire was pilot tested. The population of the research consisted of antenatal mothers of community areas. When the power analysis was performed, the sample size was calculated with a 5% error level, bidirectional significance level, 95% confidence

interval, and 80% power to represent the universe. It was found that at least 30 participants for each group and 60 antenatal mothers in total were needed.

Intervention

The study's inclusion and exclusion criteria were used to select the sample. The data was collected using the paper-pencil method. The final set of data was gathered in the month of June 2024 to July 2024. The participants were given an introduction to the study's purpose and themselves in order to build rapport. The goal of the study was described, and participants were asked to rate the confidentially of their answers in order to get an open and honest response. The participants gave their written consent. A Pre-tested, semi structured questionnaire based on JHPIEGO was used to collect data on the components of BPACR. Intervention regarding BPACR given to experimental group with the help of Power Point presentation including a video and a Pamphlet provided to mothers. A total of 60 minutes' session was given after filling the Performa regarding base line details and BPCR components. BPACR session was given to mothers who include 25 min teaching by PPT, 15 min video and distribution of pamphlets. The content included key danger signs as during pregnancy, childbirth and postpartum period and all other components are of BPCR like antenatal care faculties, counselling for institutional delivery, cash assistance benefits, identifying transport for delivery/emergency, identifying birth companion, identifying blood donor and danger signs of new born etc. There was question and answer session, which was followed by distribution of pamphlets containing information and photographs like safe motherhood, danger signs as self-help material and for future reference. All mothers were followed after a week of the training session. The data was used for scientific purpose and the individual data was kept confidential.

In experimental group

Face to face interview was conducted with the antenatal mothers. The prepared socio- demographic variables, and self- structured questionnaires was applied. Firstly, investigator took consent from the antenatal mothers after that Investigator explains the purposes of the study to participants and assured for maintenance of confidentiality. On the same day of pretest, intervention was given to experimental group. Only at different times by the researcher asked follow up and post test was conducted on the seventh day after intervention. Socio-demographic questions and answer was recorded.

Control group

Face to face interview was conducted with the antenatal mothers. The prepared socio-demographic variables and self- structured questionnaires were applied. No other treatment was given to control group. Only at different times by the researcher participants were asked socio-demographic questions and answer was recorded.

Data analysis were analysed on the basis of objectives of the study. Descriptive and inferential characteristics were used for analysis purpose. Calculation was carried out manually with the calculator and with help of MS EXCEL and also SPSS Version 22.

Figure 1 (A-C): BPACR elements.

RESULTS

Frequency and percentage distribution of selected demographic variables of antenatal mothers in selected community areas in experimental and control group were shown in Table 2.

The control group had 30 participants and the experimental group had 30 participants. In experimental group pre-test (66.7%) lies in the below average category and half of the scores (50%) lies in the good category. In control group pre-test majority (63.3%) lies in the average category and in post-test majority (70%) lies in the average category (Figure 2).

In experimental pre-test Mean±SD was 14.23±2.40 and in experimental post-test Mean±SD was 20.70±2.80 and in control pre-test Mean±SD was 15.00±2.71 in control post-test Mean±SD was 15.60±1.92. In experimental and control group pre-test the 't' value was 1.15 and p value was 0.25 NS which is not significant. And in experimental and control post-test the 't' value was 8.21 and p value was 0.00* which is significant.

Table 2: Frequency and percentage distribution of selected demographic variables of antenatal mothers (n=60).

S. no.	Socio-demographic variables	Experimental group F (%)	Control group F (%)	Chi-square	Df	P value
1	**Age in year**					
1.1	<20	1 (3.3)	1 (3.3)	3.55	3	0.31^{NS}
1.2	20-25	5 (16.7)	7 (23.3)			
1.3	26-30	9 (30)	14 (46.6)			
1.4	>30	15 (26.6)	8 (26.6)			
2	**Marital status**					
2.1	Married	30 (100)	30 (100)	Not applicable		
2.2	Unmarried	0	0			
2.3	Other	0	0			
3	**Occupation of mother**					
3.1	Mother	24 (80)	25 (83.3)	1.42	3	0.70^{NS}
3.2	Housewife	3 (10)	2 (6.6)			
3.3	Govt. employee	2 (6.6)	3 (10)			
3.4	Private employee	1 (3)	0			
4	**Occupation of husband**					
4.1	Govt. employee	2 (6.6)	4 (13.3)	2.75	3	0.43^{NS}
4.2	Private employee	11 (36.6)	15 (50)			
4.3	Farmer	6 (20)	3 (10)			
4.4	Other	11 (36.6)	8 (26.6)			
5	**Types of family**					
5.1	Nuclear	26 (86)	26 (86)	1.42	3	0.70^{NS}
5.2	Joint	4 (13.3)	4 (13.3)			
5.3	Extended	0	0			
6	**Religion**					
6.1	Hindu	30 (100)	30 (100)	Not applicable		
6.2	Muslim	0	0			
6.3	Sikhism	0	0			
6.4	Christian	0	0			
7	**Education status of mother**					
7.1	Illiterate	1 (3.3)	0	2.62	4	0.62^{NS}
7.2	Elementary	4 (13.3)	6 (20)			
7.3	Senior secondary	9 (30)	8 (26.6)			
7.4	Graduate	8 (26.6)	11 (36.6)			
7.5	Above graduate	8 (26.6)	5 (16.6)			
8	**Education status of husband**					
8.1	Illiterate	0	0	5.35	3	0.14^{NS}
8.2	Elementary	3 (10)	3 (10)			
8.3	Senior secondary	10 (33.3)	6 (20)			
8.4	Graduate	5 (16.6)	13 (43.3)			
8.5	Above graduate	12 (40)	8 (26.6)			
9	**Monthly family income (in rupees)**					
9.1	≤10000	0	0	4.35	2	0.11^{NS}
9.2	10,001-15,000	1 (3.3)	5 (16.6)			
9.3	15,001-20,000	10 (33.3)	5 (16.6)			
9.4	≥20,001	19 (63.3)	20 (66.6)			
10	**Gestational age in weeks**					
10.1	32-35	16 (53.3)	12 (40)	1.71	2	0.42^{NS}
10.2	36-39	13 (43.3)	15 (50)			
10.3	>39	1 (3.3)	3 (10)			
11	**Frequency of antenatal visit**					
11.1	1	1 (3.3)	0	1.07	3	0.78^{NS}
11.2	2	2 (6.6)	2 (6.6)			
11.3	3	6 (20)	7 (23.3)			
11.4	>4	21 (70)	21 (70)			

Continued.

S. no.	Socio-demographic variables	Experimental group F (%)	Control group F (%)	Chi-square	Df	P value
12	**Ever had termination of pregnancy**					
12.1	Once	3 (10)	8 (26.6)	5.31	2	0.07^{NS}
12.2	Twice	0	2 (6.6)			
12.3	>Twice	0	0			
12.4	Never	27 (90)	20 (66.6)			

*Significant (p≤0.05); NS= not significant (p≥0.05).

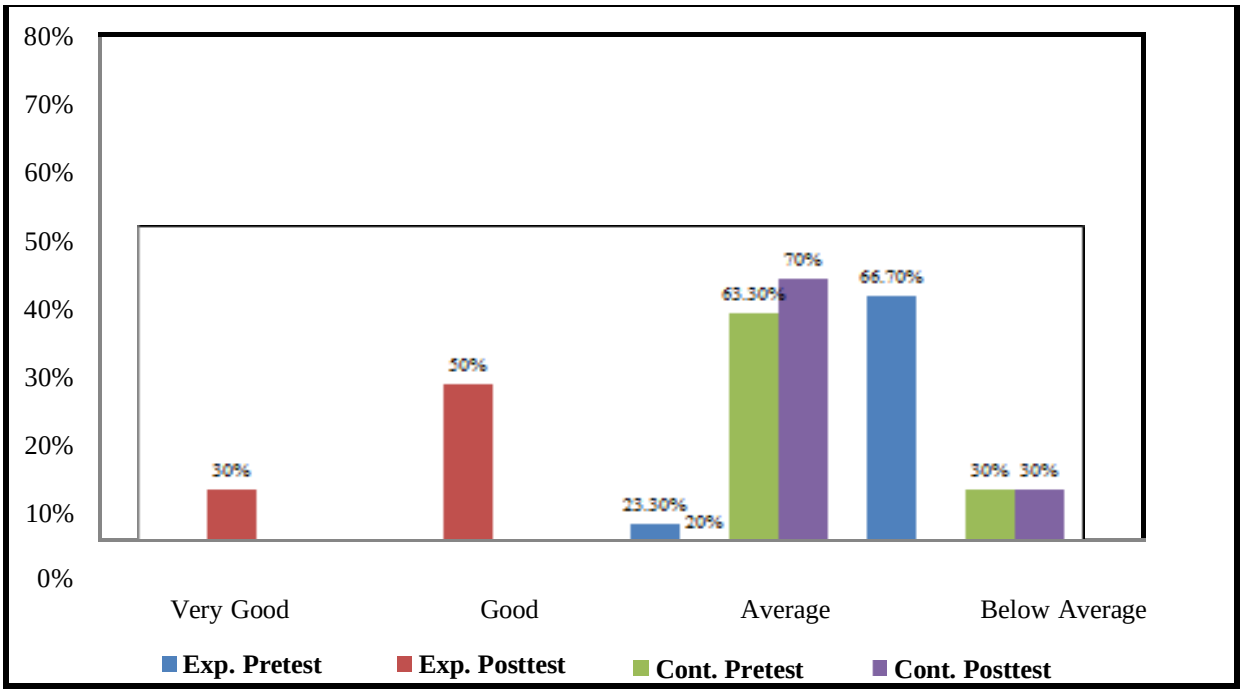

Figure 2: Frequency and percentage distribution of level of BPACR scores of antenatal mother in experimental and control group.

Table 2: Range, median, mean and standard deviation of BPACR score of antenatal mothers in experimental and control group (n=60).

Group	Range of score		Median		Mean±SD	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Experimental group	11-20	15-26	14.0	20.0	14.23±2.40	20.70±2.80
Control group	10-20	11-19	15.5	16.0	15.00±2.71	15.60±1.92

Table 3: Comparison of mean, mean difference, standard error of mean difference and 't' value of pre-test and post -test BPACR score of antenatal mothers in experimental and control group.

Group	Mean±SD	Mean$_D$	SE$_{MD}$	t value	P value
Experimental group	14.23±2.40	-0.76	0.66	-1.15	0.25^{NS}
Control group	15.00±2.71				
Post-test					
Experimental group	20.70±2.80	5.10	0.62	8.21	0.00*
Control group	15.60±1.92				

*Significant (p≤0.05); NS= not significant (p≥0.05).

Data presented in Table 4 depicts that in experimental group before intervention the mean percentage of BPCR score was 62.2% in experimental group and 28.8% in control group in the area of a birth companion, 53.3% in experimental group and 40% in control group in the area of plan for transportation, 47.7% in experimental group and 52.21% in control group in the area of plan for skilled birth attendant, 44.43% in experimental group and 45.53% in control group in the area of plan for where to give birth, 43.71% in experimental and 58.57% in control group in

the area of registration, 43.3% in experimental group and 54.16% in control group in the area of knowledge of danger sign. Data presented in Table 5 shows that after intervention the highest mean percentage 77.6% in experimental group and 61.4% in control group in the area of registration, (74.5%) in experimental group and (54.1%) in control group in the area of knowledge of danger sign, (66.1%) in experimental group and (44.3%) in control group in the area of plan for skilled birth attendant, (62.2%) in experimental group and (46.6%) in control group in area of a birth companion, (58.8%) in experimental group and (47.6%) in control group in the area of plan for transportation, (56.6%) in experimental group and (48.8%) in control group in the area of plan for where to give birth.

Table 4: Area wise mean, mean percentage, standard deviation of BPACR pre-test score of antenatal mothers in experimental and control group (n=60).

S. no.	Area	Experimental group			Control group		
		Mean±SD	Mean%	Rank	Mean±SD	Mean%	Rank
1	Registration	3.06±1.014	43.71	V	4.10±1.34	58.57	I
2	Knowledge of danger sign	3.46±1.50	43.33	VI	4.33±1.62	54.16	II
3	Plan for where to give birth	1.33±0.88	44.43	IV	1.36±0.80	45.53	IV
4	Plan for skilled birth attendant	2.86±1.25	47.76	III	3.13±1.47	52.21	III
5	Plan for transportation	1.60±0.93	53.33	II	1.20±0.92	40	V
6	A birth companion	1.86±0.93	62.2	I	0.86±0.93	28.86	VI

Table 5: Area wise mean, mean percentage, standard deviation of BPACR post-test score of antenatal mothers in experimental and control group.

S. no.	Area	Experimental group			Control group		
		Mean±SD	Mean%	Rank	Mean±SD	Mean%	Rank
1	Registration	5.43±1.04	77.6	I	4.30±1.08	61.4	I
2	Knowledge of danger sign	5.96±1.15	74.5	II	4.33±1.89	54.16	II
3	Plan for where to give birth	1.70±0.98	56.6	VI	1.26±1.21	48.8	III
4	Plan for skilled birth attendant	3.96±1.37	66.1	III	2.66±0.97	44.3	VI
5	Plan for transportation	1.76±0.97	58.8	V	1.43±0.97	47.6	IV
6	A birth companion	1.86±0.937	62.2	IV	1.40±1.00	46.6	V

Table 6: Chi square showing association of post-test BPACR score with selected demographic variable of experimental group (n=30).

S. no.	Variable	Demographic data		Level of BPACR knowledge				Association with level of BPACR knowledge		
			Options	Below Average	Average	Good	Very Good	χ^2	df	P value
1	Age (years)	1.1	<20	0	0	1	0	4.43	6	0.61^{NS}
		1.2	20-25	0	0	2	3			
		1.3	26-30	0	2	4	3			
		1.4	>30	0	3	9	3			
2	Marital status	2.1	Married	0	5	16	9	NA		
		2.2	Unmarried	0	0	0	0			
		2.3	Other	0	0	0	0			
3	Occupation of mother	3.1	House wife	0	3	13	8	7.89	6	0.24^{NS}
		3.2	Govt. employee	0	0	2	1			
		3.3	Private employee	0	1	1	0			
		3.4	Other	0	1	0	0			
4	Occupa-tion	4.1	Govt. employee	0	1	1	0	9.17	6	0.16^{NS}
		4.2	Private employee	0	3	7	1			
		4.3	Farmer	0	0	2	4			
		4.4	Other	0	1	6	4			

Continued.

S. no.	Variable	Demographic data		Level of BPACR knowledge				Association with level of BPACR knowledge		
			Options	Below Average	Average	Good	Very Good	χ^2	df	P value
5	Type of family	5.1	Nuclear	0	4	13	9	1.983	2	0.37^{NS}
		5.2	Joint	0	1	3	0			
		5.3	Extended	0	0	0	0			
6	Religion	6.1	Hindu	0	5	16	9	NA		
		6.2	Muslim	0	0	0	0			
		6.3	Sikh	0	0	0	0			
		6.4	Christian	0	0	0	0			
7	Education status of mother	7.1	Illiterate	0	1	0	0	15.62	8	0.04*
		7.2	Elementary	0	0	1	3			
		7.3	Senior secondary	0	0	5	4			
		7.4	Graduate	0	1	6	1			
		7.5	Above graduate	0	3	4	1			
8	Educat-ion status of husband	8.1	Illiterate	0	0	0	0	6.61	6	0.35^{NS}
		8.2	Elementary	0	0	2	1			
		8.3	Senior secondary	0	0	5	5			
		8.4	Graduate	0	1	3	1			
		8.5	Above graduate	0	4	6	2			
9	Monthly family income (in rupees)	9.1	≤10000	0	0	0	0	5.98	4	0.20^{NS}
		9.2	10,001-15,000	0	0	0	1			
		9.3	15,001-20,000	0	0	6	4			
		9.4	≥20,001	0	5	10	4			
10	Gestational age in weeks	10.1	32-35	0	3	10	3	3.52	4	0.47^{NS}
		10.2	36-39	0	2	5	6			
		10.3	>39	0	0	1	0			
11	Frequency of antenatal visit	11.1	1	0	0	0	1	6.29	6	0.39^{NS}
		11.2	2	0	0	1	1			
		11.3	3	0	0	3	3			
		11.4	>4	0	5	12	4			
12	Ever had termination of pregnancy	12.1	Once	0	0	1	2	2.29	2	0.31^{NS}
		12.2	Twice	0	0	0	0			
		12.3	>Twice	0	0	0	0			
		12.4	Never	0	5	15	7			

*-Significant (p≤0.05); ^{NS}-Not Significant (p >0.05).

DISCUSSION

Present study revealed that the pre-test score in experimental group 66.7% who were lying in below average and in control group 63.3% who were lying in average and in post test score in experimental group 50% who were lying good category and in control group 70% who were lying in average category similar findings were report by Yadav et al, who did study on Effectiveness of structured teaching programmed regarding birth preparedness on knowledge among primigravida which revealed that pre-test in experimental group 51.11% were lying in 9-16 and post test score 75.56% were lying in 17-23 category.[17]

Consistent result was in the similar study conducted by Akinwaare et al at baseline (P0), 60.5% of women in the control group and 66.5% of women in the intervention group had strong understanding of BPCR. On the other hand, in the first post-intervention (P1), 135 (74.2%) of the women in the control group and 146 (91.8%) of the women in the intervention group had good knowledge of BPCR.[16]

Similar findings reported by Bhattacharya et al, who did study on knowledge and practice about birth preparedness and complication readiness (BPACR) among primigravida women majority (31%) primigravida mothers had sufficient knowledge regarding BPACR, whereas (69%) shown inadequate knowledge on BPACR.[8]

Based on third objective the finding revealed that association between post-test knowledge score and selected demographic variables in experimental group and control group. The chi square test value indicates that there

was significant relationship between the knowledge score level and demographic variables (education, occupation, termination of pregnancy). Similar findings were reported by Khan et al, who did study on effectiveness of health intervention on birth preparedness on knowledge and outcome of pregnancy among antenatal mother BPACR all the p values are larger (>0.05), none of the demographic variables was found to have significant association with the mode of delivery maternal complication during labor.[9]

Present study illustrates that that there were post test score of experimental group regarding education status of mother was associated with socio demographic variables chi square was found statistically significant at the level of p<0.04. Similar findings were reported by Endeshaw et al, the a statistically significant correlation (p<0.05) was found in the bivariate logistic regression analysis between the BPCR practices of mothers and their educational status, gestational age, spouse's occupation, knowledge of pregnancy and childbirth danger signs, number of ANC visits, marital status, place of residence, spouse's education, knowledge of BPCR, monthly income, and ANC service start date.[10]

Similar study was conducted by Kadarkar et al, maternal variables and different BPACR components were associated.[21] There was a statistically significant correlation p<0.001 between mother's age, occupation, religion, and parity and awareness of pregnancy hazard symptoms. However, there was no discernible relationship between socioeconomic level and education. The first trimester ANC registration was substantially correlated with education religion and socioeconomic position that is p<0.001.

Strengths and limitations

One of the strength of the study was that the mothers were educated with IEC material to improve their knowledge and skills on BPCRR and also provided the pamphlets for future use. ASHA workers were recruited from the field for more detailed awareness and teachings to mothers. It is worth mentioning the limitations related to this study. One of the limitations of the current study, the data collection days for some of the pregnant women were not the same as their regular antenatal appointments. As data collection time period was short, for ease of administration, only awareness regarding danger signs was assessed and knowledge on the signs were disseminated.

CONCLUSION

In conclusion, marked improvement was seen through GOPE and found effective to increase in knowledge score regarding BPACR in experimental group. It will have great impact on the positive health care of maternal and child health. Efforts should be targeted to increase the awareness about various components of BPCR.

Recommendations

Further study can be conducted to assess the knowledge and practice of BPACR for GOPE among nurse midwives and health workers, also include a sort of refresher course, as to achieve SDG 3, target 1 of providing safe motherhood and reducing maternal morbidities. IEC awareness program may be initiated at PHC towards community participation so that BPACR status improves for these women.

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