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Ameliorating Awareness and Practice of Pregnancy Care Components Through a Community-Based Intervention Program: A Comparison of Baseline and Endline

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Abstract

Background: India still accounts for more than 20% of global maternal deaths. Out of which a large percentage can be prevented with timely action. For the same, Government of India is determined and launching various national schemes. However, at individual level awareness and utilization of maternal health care services is vital for successful implantation of these programmes.

Objective: To analyse the effectiveness of the intervention and to identify the factors that influence knowledge and practices during pregnancy.

Methods: This study uses the data of baseline and endline done to analyse the impact of intervention in Bihar and Maharashtra among married women (15-24 years). Both the baseline and endline followed multistage sampling procedure. The villages/wards for data collection were chosen by using Probability Proportional to Size (PPS) technique. For analysis, awareness and practice indices were made using pregnancy care indicators. Chi-square between socio-demographic variables with indices was calculated, where a value <0.05 was considered as significant.

Results: A considerable improvement from 31% to 37.1% was reported in the 'High' category of awareness index from baseline to endline. Moreover for practice index, 39.2% of women at baseline had poor practices related to pregnancy care which reduced to 19.6% by endline. Bihar has more number of women in the 'Low' category in both baseline and endline as compared to Maharashtra. Socio-demographic indicators including age at marriage, parity, household income, education, education of the husband and employment status of women showed affirmative trend and significant association with the awareness and practice indices.

Conclusions: The community based intervention package had a positive impact on the awareness and practice component of pregnancy care among women. Moreover, other socio-demographic indicators are also substantial for affirmative outcome.

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Introduction

Maternal and infant mortality continue to remain major challenges particularly across the developing world. The Sustainable Development Goal (SDG) of the United Nations has set the target of reducing maternal death to 70 per 100,000 live births level by 2030 [1]. Almost 295,000 maternal deaths occurred worldwide in 2017 alone. Despite a steady decline in maternal deaths, India today accounts for more than 20% of maternal deaths globally [2,3]. Estimates suggest that one out of every 76 women in India in the reproductive age group eventually die due to complications arising during pregnancy, childbirth, or unsafe abortion, compared to one in every 8000 in developed countries [4]. A large percentage of these deaths can be prevented if there is no delay in the decision to seek care for obstetric complications before, during and after childbirth, delay in reaching the appropriate health facility in time, and delay in receiving timely and appropriate care at the facility [5]. If these issues are not addressed urgently, India is unlikely to achieve the MMR reduction targets by 2030 as envisaged in the SDGs. The accessibility, availability, and utilization of reproductive and child health services to a large extent play an important role in determining the extent of both maternal and neonatal mortality [6].

The Government of India launched the Janani Suraksha Yojana (JSY) in 2005 to encourage the uptake of maternal and child healthcare services [7]. Additionally, antenatal, postnatal services, transportation services and support services through ASHA's supplement the JSY within the National Health Mission [8]. Antenatal check-ups provide a window of opportunity to detect and prevent adverse birth events [9]. In India, antenatal check-ups are free of cost at public health facilities [9]. Under the Pradhan Mantri Matru Vandana Yojana (PMMVY), a conditional cash transfer scheme (5000/- for the 1st living child), the pregnant woman has to register her pregnancy at the Anganwadi Centre (AWC) within four months of conception, attends at least one prenatal care session, consumes the mandated Iron-folic acid tablets and receives TT (tetanus toxoid) injection [10]. Studies have found that utilization of pregnancy care services was associated with women's education, household's standard of living, caste and religion, knowledge of the mother about the need for antenatal care, involvement of spouse [11-14]. The National Family Health Survey 2015-2016 reports that even now, only 21% of pregnant females receive full antenatal care in India [15]. Many studies in India tried to assess factors that are associated with awareness and utilization of maternal and child health services. This study analyses the effectiveness of a community based intervention model that attempts to identify the factors that influence knowledge and practices during pregnancy in Bihar and Maharashtra among (15-24 years) married women.

Materials and Methods

This study uses data collected under a three year intervention project from 2017 to understand the health seeking behaviour on

maternal and child health in low resource settings. At the initiation of the project, the baseline was conducted in two districts, Pune in Maharashtra and Khagaria in Bihar. At the end of the project in 2020, an endline was commissioned in March to understand the change in the pregnancy care related awareness and practices among the respondents at the programme sites. The baseline was meant to assess the level of awareness and prevalent practices in the community before the intervention activities commenced and the endline was conducted to assess the impact of the interventions at the end of three years. The present research paper uses data from both baseline and endline among pregnant women and women with children less than one year respectively.

Study design

Both the baseline and endline studies followed cross sectional design. The study adopted the multi stage sampling procedure, with selection of districts as first stage, followed by selection of villages and households. The villages/wards for data collection were chosen by using Probability Proportional to Size (PPS) technique, however the participant were randomly selected.

Sample size

The sample size was estimated using the Cochran method N=Z 2 P (1-P)/E 2 where Z=1.96 (95% confidence interval), P=estimated proportion of women receiving four ANC's and E (level of precision)= +0.05. The estimated required total sample size from baseline was 375 with a non-response rate of 10%. For the endline the estimated sample size was 400 at each site mothers with children less than 1 year.

Data collection

Data was collected from married women aged 15-24 years residing in the selected villages and pregnant at the time of the study or who had delivered in last one year. A household level survey was carried out using a pretested structured interview schedule, after obtaining informed consent from the respondents. In case of the women less than 18 years of age, the consent was taken from head of the household. A single interview schedule was prepared with questions on socio-demographic variables such as age, age at marriage, religion, caste, education, occupation, monthly household income, enrolment in government schemes and pregnancy care variables such as awareness about care aspects during pregnancy, minimum ANC visits, and institutional delivery, practices related to registration of pregnancy, IFA consumption, and decision for ANCs. The study captured change in knowledge and practices pre and post the interventions. Data confidentiality was maintained throughout the study.

Data analysis

Data was analysed using Statistical Package for Social Sciences (SPSS, version 22) software (IBM Corporation). Univariate analysis was carried out to determine the socio-demographic profile of the respondents and frequency distribution of pregnancy care variables. Pearson's Chi-square test was conducted to understand the association between dependent and independent variables. A p value<0.05 was considered to be statistically significant.

Dependent variables

Nine variables were identified which depict awareness and practices of women during pregnancy. Out of 9, 5 variables were for practices followed during pregnancy and 4 variables focused on the awareness of the women related to pregnancy care. Further, Indices on awareness and practice were developed using these variables. All the variables were coded in binary for the ease of computing the indices.

Developing Awareness Index: Variables on awareness includes "Care aspect during pregnancy" with 4 care aspects (regular visits to a doctor, taking TT injection, consumption of IFA and eating healthy) as options along with one "other" option, if ≥ 3 response were given by women, she scored 1 and if <3 options were answered, 0 was given. Another awareness variable was "Necessity to delivery in Health Facility" which has 3 options as Yes, No and Can't say, If a "Yes" was answered, respondent was assigned with 1 score, else assigned 0. Awareness on "Minimum ANC visits" was also assessed, if a respondent answered ≥ 4, 1 score was assigned and if answered <4, 0 was assigned. Seven options (blood pressure measurement, weight monitoring, Urine sample examination, blood sample examination, Height measurement, abdomen examination and ultrasound/ sonography) along with an "Other" option were given to assess the awareness of "women on the procedures done during an ANC visit". Women who answer ≥ 4 options were given 1 and women responded <4 procedures were given 0. An index was developed by summing up the scores of all the four variables and classified as "LOW" if cumulative score was ≤ 2, "MEDIUM" if score was 3 and "HIGH" with 4.

Developing Practice Index: Registration of pregnancy was the foremost variable in the practice index, where 1 score was given if a woman has registered her pregnancy and 0, if no registration has been done. Also if the "pregnancy was planned" by both (husband and wife), the women was assigned 1 score, else was given 0 (No option was given for making decision solely). "Decision making for ANC visit" was another variable in practice index, for which if the women herself or both husband and wife took decision 1 score was given, else given 0. Taking TT injection and consuming IFA during pregnancy were another important variable of practice index for care during pregnancy, in both affirmative responses were coded as 1 and 0 otherwise. Further the scores were summed up to create the index and categorised as "LOW" if cumulative score was ≤ 3, "MEDIUM" if score was 4 and "HIGH" with 5.

The value of the awareness and practice index ranged from 0-4 and 0-5 respectively on ratio scale. In both awareness and practice indices, categorization was done on the basis of quartiles.

Independent variables

Individual characteristic of women like women's age, age at marriage, age at marriage of husband, parity and other socio-demographic indicators including religion, family type, education, husband's education, occupation and husband's occupation were considered as independent variables that affect the awareness level and practice of pregnancy care among women of reproductive age.

Results

The socio-demographic profile of women is described in Table 1. At baseline, 45% of the interviewed women got married at age less than 18 years, whereas, it was 8.2% at endline. Majority of women in both baseline and endline were over 18 years of age (97.6%, 100%), Hindu (96.5%, 88.3%), and belonged to joint families (57% each). Majority of the women had a monthly household income of between 20,001 and 50,000 in both the rounds. A large proportion of women and their spouses at both baseline and endline had some form of formal education. Over one-fourth % of women were employed at baseline, as against about three-fourths at endline.

Table 2 describes the extent of awareness and practices related to pregnancy care among women. No major difference was found on the decision on planning of pregnancy as 72.3% of women at baseline and 70.8% at endline planned their pregnancy with their husbands. Only 61.4% of the women made the decision themselves or jointly with their husbands to go for antenatal care visits at baseline, as against 88.7% at endline. Similarly a substantial difference can be seen in IFA consumption with only 64.3% women consuming IFA at baseline against 89.3% at endline. Only 50.3% of women were aware of the 4 minimum ANC visits at baseline, as compared to 82.5% at endline.

Table 1: Socio-demographic profile (Frequency Distribution).

Variable	Categories	Baseline (%)	Baseline (n) (unweighted)	Endline (%)	Endline (n) (unweighted)
Age	<18 years	2.4	11	0	0
	18-21 years	43.9	198	22	128
	22-24 years	47	212	32.6	190
	>24 years	6.7	30	45.4	264
Age at marriage	<18 years	45	203	8.2	48
	18-24 years	54.3	245	90	524
	>24 years	0.7	3	1.7	10
Age at marriage (husband)	<21 years	25.5	115	3.8	22
	21-24 years	50.1	226	46.4	270
	>24 years	24.4	110	49.8	290
Religion	Hindu	96.5	435	88.3	514
	Muslim	3.5	16	10.7	62
	Christian	0	0	1	6
Family type	Nuclear	43	194	42.6	248
	Joint	57	257	57.4	334
Household Income	≤5000	23.7	107	16.5	96
	>5000 but ≤10000	24.8	112	14.4	84
	>10000 but ≤20000	10.2	46	20.3	118
	>20000 but ≤ 50000	31.7	143	45.4	264
	>50000	9.5	43	3.4	20
Parity	0	41.9	189	0	0
	1	36.8	166	0	0
	2	16	72	36.8	214
	≥ 3	5.3	24	63.2	368
Education (self)	Illiterate	27.3	123	3.4	20
	Primary	8.4	38	5.8	34
	Upper primary	14.2	64	16.2	94
	Secondary	24.2	109	39.2	228
	Senior secondary	16.4	74	25.4	148
	Graduate and above	9.5	43	10	58
Education (husband)	Illiterate	25.5	115	2.7	16
	Primary	8	36	3.8	22
	Upper primary	13.5	61	13.4	78
	Secondary	25.9	117	31.3	194
	Senior secondary	16.4	74	28.2	164
	Graduate and above	10.6	48	18.6	108
Occupation (self)	Agricultural labor	12.2	55	37.8	22
	Manual Daily labor	3.8	17	19.6	114
	Small/family business	4.4	20	8.9	52
	Service (pvt.)	2	9	6.5	38
	Unemployed	71.6	326	27.1	158
	Other	5.3	24	0	0
Occupation (husband)	Farmer	15.5	70	31.6	184
	Agricultural labor	37.5	169	13.1	76
	Manual Daily labor	10.9	49	22	128
	Small/family business	13.7	62	11.7	68
	Service (pvt.)	19.7	89	19.2	112
	Unemployed	2.4	11	2.1	12
	Other	0.2	1	0.3	2

Comparatively more of the women at endline (80.8%) were aware of 4 or more services, provided at ANC visit, than the women at baseline (52.5%)

Distribution of women based on the awareness and practice indices categories at baseline and endline is depicted in Table 3. Forty seven percent of the women at baseline have low awareness index, however at endline this reduced to 20.6%. A considerable improvement from 31% to 37.1% was reported in the 'High' category of awareness index. For practice index, 39.2% of women at baseline had poor practices related to pregnancy care which reduced to 19.6% by endline. Moreover, 50.2% of women at endline scored high in practice index against 37.9% at baseline. The chi-square for baseline and endline for both the indices was significant.

Table 4 describes the results of chi-square test between awareness index and socio-demographic variables. At baseline and endline, states showed significant relation with awareness index. Among respondents who married after 18 years of age, majority were in the 'High' awareness category at baseline. And further significant increase at endline can be seen. Similarly findings were reported for the spouses of respondents, where majority of those who got married after 21 years of age were in the 'High' awareness category (45% for 21-24 years and 33% for >24 years) and by endline this had significantly amplified further. A positive trend was reported with the household income and awareness of pregnancy care components. Those who had a household income of ≤ 5000 showed a significant increase in the 'High' category of awareness index between baseline and endline (7.5% to 77%). As the education level increased, an increase in the awareness level was reported at baseline, and more women with higher education fall under the 'High' category of awareness index. A

significant change was seen from baseline to endline among women educated up to upper primary, however a negative trend was observed among women with higher qualifications from baseline to endline. Similar findings were reported for their spouses where respondents whose spouses were educated up to Graduation and above have highest awareness level (54% in High category). Moreover a positive and significant change was observed among women whose spouses were educated up to at least secondary.

Table 5 describes the results of chi-square between practice index and socio-demographic variables. No significant relationship was found between age at marriage, age at marriage of spouse, religion, education of spouse and practices related to pregnancy care. Among respondents who were <18 years, majority of the women were in the 'Low' practice category (73%) and majority of the women aged >24 were in 'High' practice category (83%) at baseline. A significant change was observed for practice index from baseline to endline for maximum of the age categories. Those who had a household income of ≤ 5000 showed lowest level of practice and women with household income of >20000 but ≤ 50000 has the highest level of practice at baseline. A significant increase in the practice was reported from baseline to endline among all the household income categories, which was clearly interpreted from the increase in 'Low' category of practice index. However for 'High category' highest increase (from 24% at baseline to 57% at endline) was reported among women with household income >10000 but ≤20000. Educational level of the women showed significant increase in the high practice level between baseline and endline. Maximum of the women (67%) with higher education falls under the 'High' category at baseline and at endline maximum of the women (55%) with education up to upper primary falls under 'High' category.

Table 2: Percentage distribution of the respondents by their awareness and practice indicators.

Practice Indicators	Baseline (%)	Baseline (n) (unweighted)	Endline (%)	Endline (n) (unweighted)
Planned pregnancy	72.3	326	70.8	412
Registered pregnancy	95.6	431	88	512
Decision making for ANC visits	61.4	277	88.7	516
TT injection administered	88.5	399	85.9	500
IFA consumption	64.3	290	89.3	520
Awareness Indicators	**Baseline (%)**	**Baseline (n) (unweighted)**	**Endline (%)**	**Endline (n) (unweighted)**
Care aspect during Pregnancy	56.3	254	54.5	317
Delivery in Health facility	97.3	439	95.2	554
Minimum ANC visits	50.3	227	82.5	480
Health checkups in ANC	52.5	237	80.8	470

Table 3: Percentage distribution of practice and awareness indices for baseline and endline survey.

	Awareness Index (%)			Total	Chi-square
	Low	Medium	High		
Baseline	46.8	22.2	31	451	87.6***
Endline	20.6	42.3	37.1	582	
	Practice Index (%)			**Total**	**Chi-square**
Baseline	39.2	22.8	37.9	451	48.5***
Endline	19.6	30.2	50.2	582	

Table 4: Results from chi-square test between awareness index and socio-demographic variables of baseline and endline survey.

Variables	Categories	Baseline (%)			Baseline (n) (un-weighted)	Chi-square	Endline (%)			Endline (n) (un-weighted)	Chi-square
		Low	Medium	High			Low	Medium	High		
State	Bihar	77.5	15.8	6.8	222	179.1***	18.4	30.1	51.5	272	47.3***
	Maharashtra	17	28.4	54.6	229		22.6	52.9	24.5	310	
Age	<18 years	63.6	27.3	9.1	11	8.2	0	0	0	0	9.4*
	18-21 years	46.5	22.7	30.8	198		21.9	34.4	43.8	128	
	22-24 years	49.1	20.8	30.2	212		25.3	42.1	32.6	190	
	>24 years	26.7	26.7	46.7	30		16.7	46.2	37.1	264	
Age at marriage	<18 years	69.5	16.7	13.8	203	82.9***	12.5	33.3	54.2	48	15.7**
	18-24 years	27.8	26.9	45.3	245		21.8	43.5	34.7	524	
	>24 years	66.7	0	33.3	3		0	20	80	10	
Age at marriage (husband)	<21 years	77.4	13.9	8.7	115	73.9***	9.1	9.1	81.8	22	20.7***
	21-24 years	42.5	24.8	32.7	226		19.3	44.4	36.3	270	
	>24 years	23.6	25.5	50.9	110		22.8	42.8	34.5	290	
Religion	Hindu	47.6	21.6	30.8	435	3.6	21.4	42.8	35.8	514	11.5*
	Muslim	25	37.5	37.5	16		16.1	41.9	41.9	62	
	Christian	0	0	0	0		0	0	100	6	
Family type	Nuclear	62.9	18	19.1	194	37.2***	25.8	37.5	36.7	248	7.9*
	Joint	34.6	25.3	40.1	257		16.8	45.8	37.4	334	
Household Income	≤ 5000	76.6	15.9	7.5	107	112.8***	12.5	10.4	77.1	96	168.4***
	>5000 but ≤10000	58	18.8	23.2	112		19	42.9	38.1	84	
	>10000 but ≤20000	60.9	17.4	21.7	46		47.5	47.5	5.1	118	
	>20000 but ≤50000	16.1	30.1	53.8	143		11.4	49.2	39.4	864	
	>50000	30.2	25.6	44.2	43		30	70	0	20	
Parity	0	36.5	27.5	36	189	42.7***	0	0	0	0	15.1***
	1	42.8	20.5	36.7	166		0	0	0	0	
	2	73.6	16.7	9.7	72		12.1	48.1	39.7	214	
	≥3	75	8.3	16.7	24		25.5	38.9	35.6	368	
Education (self)	Illiterate	85.4	8.9	5.7	123	141.0***	30	20	50	20	12.7
	Primary	63.2	26.3	10.5	38		23.5	47.1	29.4	34	
	Upper primary	40.6	34.4	25	64		25.5	42.6	31.9	94	
	Secondary	29.4	25.7	45	109		17.5	41.7	40.8	228	
	Senior secondary	21.6	23	55.4	74		23	45.3	31.8	148	
	Graduate and above	18.6	27.9	53.5	43		13.8	41.4	44.8	58	

Variable	Category	Low	Medium	High	n	Chi-square	Low	Medium	High	n	Chi-square
Education (husband)	Illiterate	81.7	9.6	8.7	115	119.4***	12.5	25	52.5	16	28.3**
	Primary	66.7	19.4	13.9	36		9.1	54.5	56.4	22	
	Upper primary	52.5	29.5	18	61		17.9	33.3	48.7	78	
	Secondary	25.6	29.9	44.4	117		20.6	36.1	43.3	194	
	Senior secondary	23	28.4	48.6	74		22	45.7	32.3	164	
	Graduate and above	29.2	16.7	54.2	48		24.1	54.6	21.3	108	
Occupation (self)	Agricultural labor	47.3	29.1	23.6	55	31.5**	30.9	39.1	30	220	69.8***
	Manual Daily labor	82.4	11.8	5.9	17		7	63.2	29.8	114	
	Small/family business	30	50	20	20		23.1	26.9	50	52	
	Service (pvt.)	55.6	0	44.4	9		21.1	63.2	15.8	38	
	Unemployed	47.7	20.1	32.2	323		15.2	31.6	53.2	158	
	Service (govt.)	0	33.3	66.7	3		0	0	0	0	
	Other	26	25	50	24		0	0	0	0	
Occupation (husband)	Farmer	28.6	22.9	48.6	70	116.3***	27.2	42.9	29.9	184	58.4***
	Agricultural labor	74.6	17.8	7.7	169		39.5	42.1	18.4	76	
	Manual Daily labor	49	28.6	22.4	49		10.9	35.9	53.1	128	
	Small/family business	29	29	41.9	62		14.7	52.9	32.4	68	
	Service (pvt.)	20.2	23.6	56.2	89		12.5	43.8	43.8	112	
	Service (Govt)	45.5	9.1	45.5	11		16.7	16.7	66.7	12	
	Unemployed	0	0	100	1		0	100	0	2	

Table 5: Results from chi-square test between practice index and socio-demographic variables of baseline and endline survey.

Variables	Categories	Baseline (%)			Baseline (n) (un-weighted)	Chi-square	Endline (%)			Endline (n) (un-weighted)	Chi-square
		Low	Medium	High			Low	Medium	High		
State	Bihar	69.8	26.1	4.1	222	238.4***	26.5	36.8	36.8	272	37.8***
	Maharashtra	9.6	19.7	70.7	229		13.5	24.5	61.9	310	
Age	<18 years	72.7	18.2	9.1	11	34.1***	0	0	0	0	24.2***
	18-21 years	41.4	25.3	33.3	198		18.8	31.2	50	128	
	22-24 years	40	22.6	37.3	212		30.5	27.4	42.1	190	
	>24 years	6.7	10	83.3	30		12.1	31.8	56.1	264	
Age at marriage	<18 years	54.2	27.6	18.2	203	65.1***	25	20.8	54.2	48	3.1
	18-24 years	27.3	19.2	53.5	245		19.1	31.3	49.6	524	
	>24 years	0	0	100	3		20	20	60	10	
Age at marriage (husband)	<21 years	66.1	29.6	4.3	115	88.1***	36.4	27.3	36.4	22	7.7
	21-24 years	35.8	19.9	44.2	226		17	28.1	54.8	270	
	>24 years	18.2	21.8	60	110		20.7	32.4	46.9	290	
Religion	Hindu	39.5	23	37.5	435	1	16.7	30.4	52.9	514	42.6***
	Muslim	31.2	18.8	50	16		45.2	22.6	32.3	62	
	Christian	0	0	0	0		0	100	0	6	
Family type	Nuclear	52.6	24.2	23.2	194	35.1***	23.4	33.9	42.7	248	9.8**
	Joint	29.2	21.8	49	257		16.8	27.5	55.7	334	
Household Income	≤5000	61.7	27.1	11.2	107	138.1***	41.7	45.8	12.5	96	114.3***
	>5000 but ≤10000	58	22.3	19.6	112		26.2	42.9	31	84	
	>10000 but ≤20000	43.5	32.6	23.9	46		23.7	18.6	57.6	118	
	>20000 but ≤ 50000	10.5	18.9	70.6	143		7.6	25.8	66.7	264	
	>50000	25.6	16.3	58.1	43		20	30	50	20	

Category	Subcategory					stat					stat
Parity	0	34.4	22.2	43.4	189	29.0**	0	0	0	0	29.1***
	1	32.5	24.1	43.4	166		0	0	0	0	
	2	61.1	22.2	16.7	72		8.4	30.8	60.7	214	
	≥3	58.4	20.8	20.8	24		26.1	29.9	44	368	
Education (self)	Illiterate	63.4	30	5.7	123	114.7***	30	40	30	20	18.0*
	Primary	57.9	21.1	21.1	38		17.6	35.3	47.1	34	
	Upper primary	42.2	26.6	31.2	64		27.7	17	55.3	94	
	Secondary	22	21.1	56.9	109		17.5	31.6	50.9	228	
	Senior secondary	25.7	13.5	60.8	74		20.3	33.8	45.9	148	
	Graduate and above	16.3	16.3	67.4	43		10.3	31	58.6	58	
Education (husband)	Illiterate	69.6	24.3	6.1	115	120.0***	37.5	25	37.5	16	14.6
	Primary	44.4	36.1	19.4	36		27.3	18.2	54.5	22	
	Upper primary	49.2	24.6	26.2	61		20.5	38.5	41	78	
	Secondary	23.1	22.2	54.7	117		17.5	33	49.5	194	
	Senior secondary	16.2	16.2	67.6	74		18.3	31.7	50	164	
	Graduate and above	25	18.8	56.2	48		20.4	20.4	59.3	108	
Occupation (self)	Agricultural labor	27.3	20	52.7	55	29.8**	9.1	24.5	66.4	220	98.5***
	Manual Daily labor	52.9	29.4	17.6	17		15.8	19.3	64.9	114	
	Small/family business	15	25	60	20		23.1	38.5	38.5	52	
	Service (pvt.)	44.4	33.3	22.2	9		21.1	26.3	52.6	38	
	Unemployed	43.7	23.2	33.1	323		35.4	44.3	20.3	158	
	Service (govt.)	0	0	100	3		0	0	0	0	
	Other	20.8	16.7	62.5	24		0	0	0	0	
Occupation (husband)	Farmer	22.9	27.1	50	70	144.1***	5.4	29.3	65.2	184	66.9***
	Agricultural labor	67.5	25.4	7.1	169		31.6	21.1	47.4	76	
	Manual Daily labor	34.7	22.4	42.9	49		28.1	39.1	32.8	128	
	Small/family business	22.6	11.3	66.1	62		39.4	20.6	50	68	
	Service (pvt.)	12.4	22.5	65.2	89		17.9	32.1	50	112	
	Service (Govt)	45.5	18.2	36.4	11		16.7	50	33.3	12	
	Unemployed	0	100	0	1		100	0	0	2	

Discussion

Overall, a positive effect of the intervention was seen on the beneficiaries awareness and practice aspects pertaining to pregnancy care. Through the intervention; women, their spouses, family members and other community stakeholders were reached directly providing information on maternal health issues to create an enabling environment to improve choices and health service uptake. Adequate focus was given on awareness related to pregnancy care to increase the utilization as mentioned in a decision tree analysis, to conduct interventions focused on improving awareness to increase utilization [16]. In this study, awareness and practices related to the pregnancy care increased remarkably in the intervention sites with respect to registering the pregnancy, making decision on availing ANC, getting TT injections, consumption of IFA, awareness of care aspects related to pregnancy, importance of delivering at health facility, minimum ANC visits and health check-ups in ANC. Similar findings were reported by many researchers [17-20]. For ease of representation when these care aspects were formulated in Awareness and practice indices, a considerable positive change was observed between baseline and endline, delineating effective interventions. Moreover both the indices showed significant interaction with maximum of the socio-demographic indicators. For both awareness and practice index, a consistent increase has been seen in the 'Medium' category from baseline to endline when associated with socio-demographic

indicator, however other two extreme categories 'Low' and 'High' showed inconsistent results.

The 'Low' category of both the indices for Bihar state showed a decrease from baseline to endline, however, the same index category showed opposite result for the state of Maharashtra, pointing towards unlike intervention effect. This could be attributed to the limitations of this study as mentioned later in the article. As seen in Bihar, similar effect of intervention was reported by Sharma et.al [20] in Rajasthan and Uttar Pradesh on awareness pertaining to ANC which is one of the indicator in the awareness index. Patel et.al. and Shikha et.al [21,22] in their studies stated that increase in the age of women, their age at marriage and age of their husband at marriage leads to higher awareness and practices related to pregnancy care which are in congruence with our study. Moreover, a positive impact of intervention can be seen for both awareness and practice index on these indicators. Women belonging to Hindu and Muslim religion depict a positive trend in the awareness index in baseline and endline, however in practice index women from Muslim religion does not follow a positive trend, as also stated in a study conducted from DLHS data, Muslim women tend to utilize less maternal health services compared to their other counterparts from other religion [23].

Women belonging to nuclear families are more likely to utilize pregnancy care services [24] and showed a positive effect of intervention in both awareness and practice index with an increasing

trend in the 'High' category from 19% to 37% and 23% to 43% respectively. Monthly Household income is another important socio-demographic indicator effecting knowledge about pregnancy care and its utilization as mentioned in various researches [24-26]. Alike findings were reported in the current study. However, women with high household income showed a negative response from baseline to endline. This may be attributed to the fact that women with higher household income experience higher autonomy and have financial aids to spend on the utilization of these services. Moreover, this may be because of limitation of line-listing throughout the project duration and hence not all women were equally benefited. Also, a significant effect of intervention was visible on both indices with household income. It was also observed that with an increase in the parity, percentage of women in 'Low' category for awareness and practice index also increased. That may be attributed to knowledge, experience, and confidence that mothers with more number of children gain from previous births [27]. Moreover, a positive change was observed in the 'High' category of awareness and practice index with parity showing affirmative intervention effect.

Education of the women and their husbands is a salient factor associated with a number of pregnancy care component from awareness [28] to its utilization [23,29,30]. Correspondingly, in the present study significant results were reported for education (women and husband) and both indices, depicting that women with higher education status are more aware and willing to utilize pregnancy care. Moreover, employment status of the women also plays significant role in awareness and practice of services pertaining to pregnancy [30,31]. Highest number (35%) of the women who are not working fall under the 'Low' category in the practice index even after receiving intervention. This may be because of limited autonomy given to housewife for decision making [32] and movement [33]. Similarly in the present study women whose husbands have a government or private job or a business were more aware and utilize pregnancy care aspects as compared to women whose husbands are either engage in agriculture or work as a laborer which is in consistent with the findings of a study done in Nepal by Thapa and Niehof [34].

Conclusions

Overall, there was a positive effect of intervention on the awareness and practice component of pregnancy care among the women. All the categories of awareness and practice index showed considerable results from baseline to endline, however when associated with socio-demographic indicators, inconsistent outcomes were found. The inconsistency in the results may be because of the limitations of the implementation project as mentioned later in the article. Socio-demographic indicators like state, age at marriage, age at marriage of husband, family type, household income, parity, education, education of husband, occupation and occupation of the husband are significantly related with both the indices and vital for affirmative outcomes. Moreover, as done in the project, to improve the awareness and utilization of pregnancy care components in contemporary India, engaging associated stakeholder like husbands, other family members, and community members along with 'women' is necessary.

Limitations

The sampling at the endline was population based, so it was difficult to exactly measure the impact of the set of interventions on the population as same respondents were not followed from baseline to endline. The line listing was done throughout the project

implementation duration to meet the target sample and hence all the participants could not equally benefited. Moreover, direct indicators were difficult to identified, hence proxy indicators were used to see the impact. As, in case of IFA consumption, number of IFA consumed was avoided as a direct variable because the women enrolled at the time of baseline were pregnant women and might be consuming differently in different trimester. Additionally the government policy at the time of baseline in 2017 was to consume at least 100 IFA tablets, which changes to 180 IFA tablets by the endline in 2020.

Conflicts of Interest

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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