International Journal of Health Sciences and Research
Vol.13; Issue: 5; May 2023
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Implementation Research on the Effectiveness of Care Group Model in Improving Knowledge and Practices of MCHN Services by Community Mothers in India

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DOI: https://doi.org/10.52403/ijhsr.20230517

ABSTRACT

Background & objectives: Knowledge and practices of Maternal and child health (MCH) services is vital for improved health and nutrition among children and mothers. This study has used implementation research on the "Care Group Model" a behaviour change communication approach to assess the knowledge and child health care practices of mothers.
Methods: The study was conducted in the districts of Odisha which is in the eastern state of India. This study has used a cluster sampling technique to collect the data of the Care Group intervention of the first 1000 days during pregnancy and thereafter among mothers/caregivers of children up to 2 years. This study has followed a mixed-method approach using both quantitative and qualitative data from study population.
Results: Implementation of care group model in the four blocks had a great impact on the knowledge, attitude, and practices of mothers or caretakers of young children on the various aspects of maternal and child health. Mothers in the intervention area were found to be better at managing diarrhoea, i.e., they had better knowledge of giving more fluids, solid food and ORS during diarrhoeal episode.
Interpretation & conclusion: This study concludes that the care group is more effective in the intervention areas by improving children's health and massive behavioural changes that happened in the mother's pregnancy care. Expanding the intervention of care group models in other areas of RMNCHA could be a policy suggestion.

Keywords: Care Group Model; Implementation Research; Maternal and Child health; Nutrition; Odisha.

INTRODUCTION

Maternal and child health has always been a major concern in developing countries impeding a large burden on the healthcare system of the nation. Inequity in MCH is existing and ultimately leads to increased maternal and infant mortality rates. A steady decline in maternal, and child health and nutritional deficiencies in India has been observed over the years due to the introduction of various public health interventions such as the National Health Mission, yet not sufficient enough to meet the United Nation's Sustainable Development Goals [1]. Lack of knowledge about healthy & safe behaviours, lack of nutrition, poverty, social norms, and lack of access to basic healthcare in India are some of the important causes of worse health outcomes [2]. In the corollary, the latest National Family Health Survey-5 (NFHS-5) report of India shows an overall

improvement in maternal and child health care in terms of lower fertility, reduce teenage pregnancy, and rising immunization coverage of children in all states but it also requires community level awareness to implement various welfare schemes of the government [3]. Therefore, research on knowledge and practices of MCHN services by Community Mother's in India is of utmost essential to achieve the sustainable development goals by 2030 [4].

Odisha, an eastern state of India with more than 42 million inhabitants, has been performing poorly in terms of maternal and child health, especially among the tribal communities [5]. As per UNICEF's State of the World's Children 2019 report, malnutrition was the primary reason behind 69 per cent of deaths of children below the age of five in India [6]. The situation in Odisha is no different as it continues to be plagued by a high level of malnutrition despite improvement in recent years. The first 1,000 days from the start of a woman's pregnancy until her child's second birthday offer a unique window of opportunity to shape healthier and more prosperous futures. The right nutrition during this 1,000 days window can have an enormous impact on a child's ability to grow, learn, and rise out of poverty [7, 8].

Involvement of community groups, frontline health workers and volunteers in promoting healthy behaviours in the community is profoundly a common and effective intervention [9, 10].

Objectives of the present study is to study the effectiveness of "Care Group Model" in improving the knowledge and child health care practices of mothers. Care Groups are peer-based health promotion programs that can quickly and effectively improve healthy behaviours and outcomes in low-resource communities. A care group is a group of 10-15 volunteers from the community, including pregnant women and mothers with children under two. These volunteers facilitate the mothers' group and engage in behaviour change communication. Care Groups create a multiplying effect to equitably reach every family with pregnant women and children under two years of age with individualized Behaviour Change Communication (BCC) and social support.

MATERIALS & METHODS

Study area and sampling: The study was conducted in 5 districts of Odisha which is in the eastern state of India. The baseline for this study was taken in 2017 and the end line was conducted in 2019. Using cluster sampling, the sample was drawn from 30 clusters identified through a random process. The sampling frame constituted all the communities in the intervention and non-intervention block. The communities were listed and the sampling interval was calculated starting with an initial random number. The first household in each cluster was chosen using the spin-the-bottle technique and thereafter, using the right-hand rule, 14 consecutive households were selected. However, those who were part of Care Group program having children up to years were picked in the intervention block. Except Rayagada which is a control district, rest all the districts has World Vision India's presence for past 5 years. Since our interventions are directly in the community, local CBOs, panchayats and village leaders are aware of the interventions and the survey undertaken was informed prior in the community. Community Development Facilitator of World Vision India collected the data using kobo tool in intervention area whereas the local community volunteers (paid) were selected and trained to conduct the survey in non-intervention area. In the control area, World Vision India team approached the Block Development Officer who is the head of the block and submitted a letter to conduct the survey and requested to send an official communication to his subordinates for necessary local support. The Child Development Project Officer of Women and Child Development Department was also approached to keep them informed on the process. We informed to every village sarpanch (Village head) about letter submitted to BDO before conducting the

survey and then proceeded for data collection using kobo tool in the control area. The table below shows the sample size for this study:

Sample Size: Sampling was performed for the targeted population with the calculation of children under 2 years of age. The prevalence of such a population is found to be less than 5%. Hence the number of mothers with child (0-5 months) under our sample was calculated from the following formula:

$$n = (Z_{\frac{\alpha}{2}} + Z_{\beta})^2 \, X \, \frac{p_1(1-p_1) + p_2(1-p_2)}{(p_1 - p_2)^2}$$

n is the desired sample size in the current multicentric RCT; z = z-score, where Zα/2 is the critical value of the Normal distribution at α/2 (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96), Zβ is the critical value of the Normal distribution at β (e.g. for a power of 80%, β is 0.2 and the critical value is 0.84). α is the type I error permissible. β is the type II error permissible. p_1 and p_2 are the expected sample proportions of the two groups in the target population of this study. The sample comes out to be 420 per cluster with the given calculation. With five blocks 30 clusters were studied and the total sample in the study comes out to be 2100. Table 1 shows the sample distribution for this study.

Table 1. Sample Distribution

District	Block	Type of Block	Total Number of respondents
Nuapada	Khariar	Intervention Block	420
Kalahandi	Narla	Intervention Block	420
Sambalpur	Sambalpur Municipal Area	Intervention Block	420
Balangir	Loisingha	Intervention Block	420
Rayagada	Muniguda	Non-intervention Block	420
Total	**5**		**2100**

Study Design: This study has followed a mixed-method approach using both quantitative and qualitative data from the study population. The respondents for the quantitative part of the study were mothers/care givers of children upto 2 years. For the qualitative part, both Focused Group Discussions (FGDs) and In-depth Interviews (IDIs) were conducted with different stakeholders in intervention blocks. FGDs were conducted with mother in law, grandmothers, pregnant and lactating mothers, IDIs were conducted with ASHAs, ANMs, AWWs and Care group staff and volunteers across all selected blocks.

Data Collection and Analysis: The data was collected using an Android-based, mobile application. Orientation/ training of data collection tools were provided to data collectors. Quantitative data was analysed using SPSS. Qualitative data collected via FGDs and IDIs were translated in English language and typed in MS Office.

Ethical Consideration: Ethical clearance to conduct this implementation research protocol was approved by the Institutional Ethics Review Committee of World Vision India.

RESULT

Status of Knowledge and Practices on MCHN Aspects: This section presents a comparison of the status of knowledge and practices of mother/care givers on MCHN aspects during the endline survey against the baseline survey. The key indicators for maternal and child health are: ANC visit by the mother during her last pregnancy, breastfeeding and exclusively breastfeeding, food and liquid consumed during last episode of diarrhoea, ORS given to the child during diarrhoea. In addition to baseline and end-line data, NFHS-4 data for Odisha has also been included for comparison.

Ante-natal Care Services: Respondents with a child less than 2 years were questioned about their ANC visit and the antenatal care

received during the last pregnancy. As shown in the figure 1 there was an increase in the proportion of the women reporting to have received ANC, for all intervention and non-intervention districts.

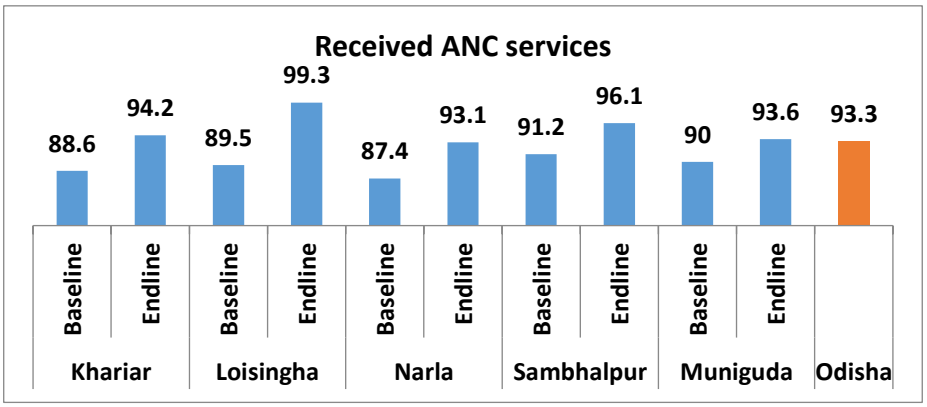

Figure 1. Comparison of Baseline an end-line Values: Percent distribution of respondents by ANC during last pregnancy

Breastfeeding Practices: Knowledge of the significance of early initiation and exclusive breastfeeding among the mothers of children of 0-6 months in all the sites was assessed. Figure 2 shows that the proportion of mothers reporting exclusively breastfeeding showed remarkable increases across all districts.

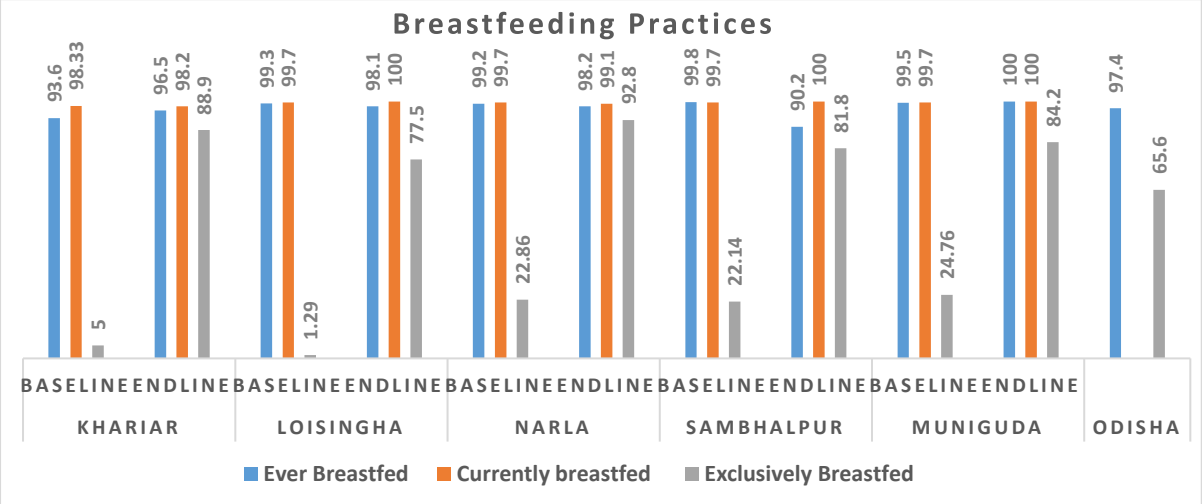

Figure 2. Comparison of Baseline an end-line Values: Percent distribution of respondents by breastfeeding practices

Diarrhoea Management: Diarrhoea being one of the most prevalent diseases among children under 5 years signifies the importance of its prevention and management. Figure 3 shows liquids given during last episode of diarrhoea among children less than 5 years shows response which could be not breastfed, liquids given less than usual, liquids given as usual or liquids more than usual. The response which was promoted during the intervention was to give more liquids so that the child is not de-hydrated. The graph shows that other than Sambalpur, the response of not breastfed has increased over baseline in all the districts. In Khariar, it increased by 5 times from around 8 percent in baseline to 35 percent in end-line. In Narla and Muniguda, none reported to have not breastfed/discontinued breastfed during baseline but by end-line, about 5 percent and 10 percent reported to be not breastfeeding, respectively. Similarly, other than Khariar, at all places, liquids were reported to have been given less in the end-line study and the proportion of such people showed an increase over base-line values.

The positive thing is at all districts, other than Narla, there was an increase in the response to giving more than usual liquid during diarrhoea.

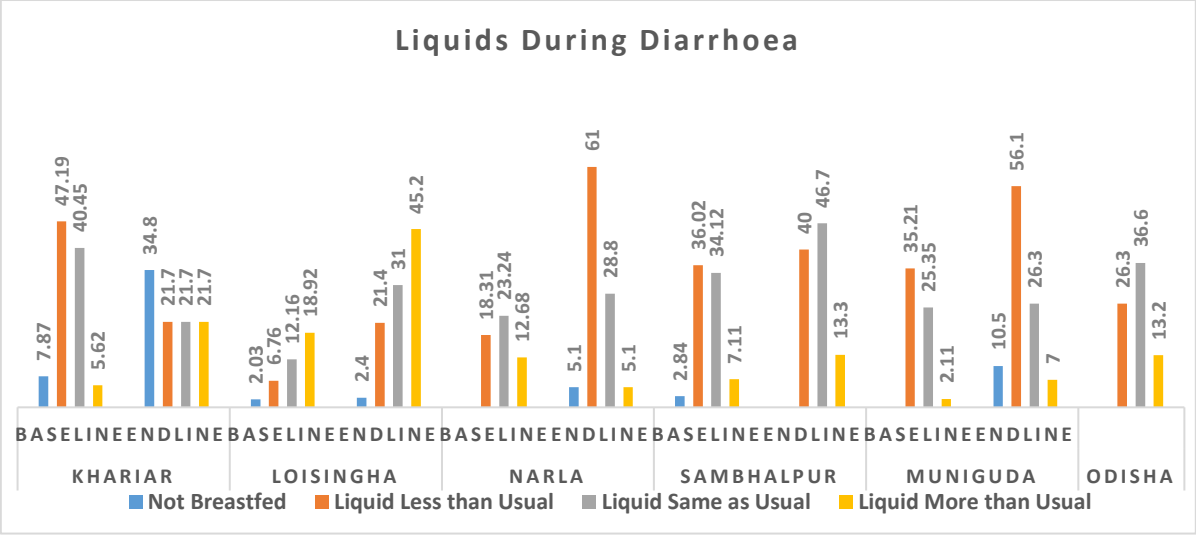

Figure 3.: Comparison of Baseline an end-line Values: Percent distribution of respondents by Liquids given to child during last Diarrhea Episode

Figure 4 shows the response for food given to the child during diarrhoea. More food or same amount of food was promoted during diarrhoea. The proportion of the mothers reporting that no food was given to children during diarrhoea showed increase in base-line over baseline in all districts except Khariar and Sambalpur. Other than Narla and Muniguda, in all districts, less proportion of respondents reported having given less food during diarrhoea in the end-line survey compared to baseline.

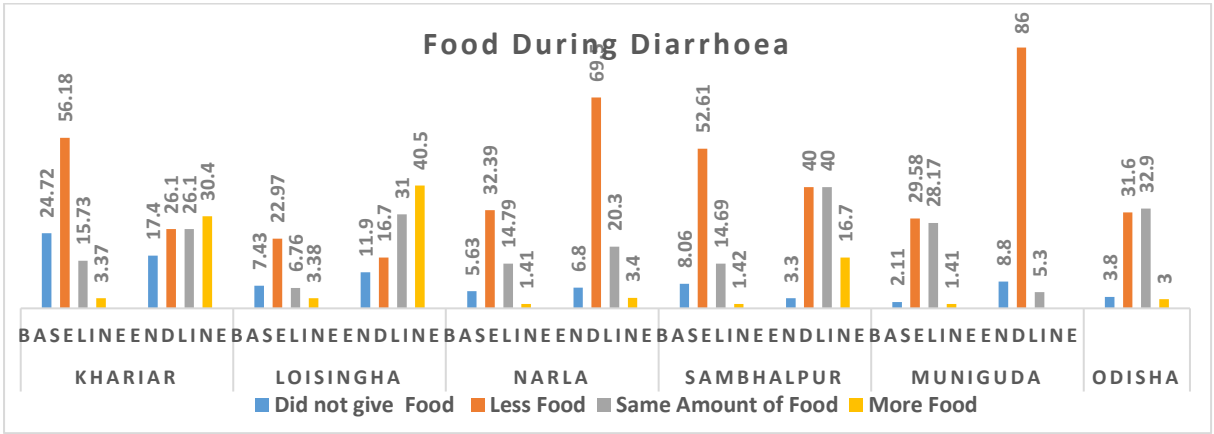

Figure 4. Comparison of Baseline an end-line Values: Percent distribution of respondents by food given to child during last Diarrhea Episode

In all intervention blocks, the proportion of the respondents reporting giving more food or same amount of food showed a rise in end-line over base-line values. All the mothers who reported diarrhoea for their children were asked whether they gave ORS to their children or not. The responses were captured for three types of ORS-Home-made ORS (Mixture of sugar, Salt, and water), local ORS (provided by AWW in powder form), and Pre-packaged ORS which is available at any pharmacist. While all types of ORS are good, the use of local ORS was promoted as it is available at AWC and with home-made ORS, risk of contamination cannot be overruled. Figure 5 shows that at all places, there was an increase in proportion of cases reporting use of local ORS and pre-packaged ORS over baseline values.

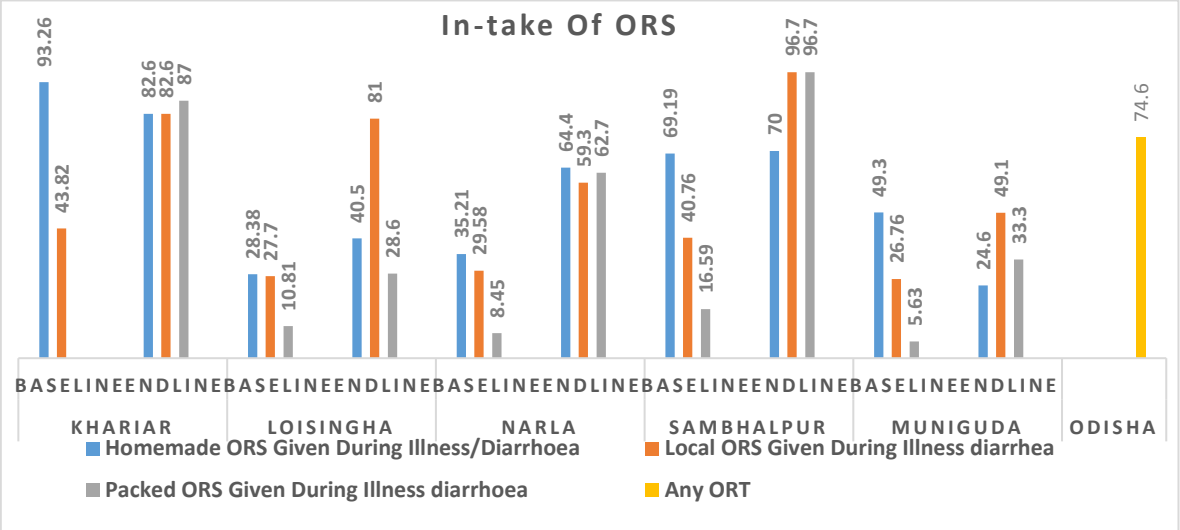

Figure 5. Comparison of Baseline and end-line Values: Percent distribution of respondents by ORS given to child during last Diarrhea Episode

Association of intervention with knowledge and practices of MCHN aspects:

The below section presents a comparison between the status of knowledge and practices of the mothers/caregivers on MCHN practices in intervention blocks (Khariar, Loisingha, Narla, Sambalpur) and non-intervention block (Muniguda). The status in the intervention areas is better than non-intervention areas both in knowledge and practices on the indicators shown below. Chi-square test (Table 2) has been used to test the association and it has been found to be statistically significant for all the parameters of knowledge.

Table 2. Association between knowledge of the mothers/caregivers and implementation of care group model

	Intervention Blocks	**Non-Intervention Block**		
Knowledge of mother/caregivers	%	%	Chi Sq Value	Level of Significance
Knowledge on Danger signs of Pregnancy (N)	**1680**	**420**	**1406.59**	**.000***
Swollen hands and swollen face	91.3%	58.1%		
Excessive or prolonged vomiting	89.0%	56.9%		
Dizziness and blurred vision	70.4%	29.5%		
Bleeding	65.5%	5.0%		
Convulsions	37.6%	6.2%		
Knowledge on Family Planning Methods (N)	**1680**	**420**	**2054.37**	**.000***
Condom	94.0%	26.2%		
Oral Pills	88.5%	52.6%		
Lactational Amenorrhea Method (LAM)	22.4%	0.2%		
Copper T	84.2%	35.0%		
Female Sterilization	34.7%	0.2%		
Male Sterilization	12.1%	0.5%		
Knowledge on type of complementary food to be given to the child (N)	**1680**	**420**	**2357.89**	**.000***
Growth foods-includes meats, eggs, fish, milk products and legumes/dal	92.1%	82.1%		
Protective foods -includes fruits and vegetables	95.4%	12.1%		
Energy foods- includes all the different grains	91.1%	21.4%		
knowledge on Benefits of food groups (N)	**1680**	**420**		
Growth Foods helps a baby to grow and become bigger	99.0%	26.0%	1595.11	.000*
Protective Foods helps to protect the baby from getting sick	98.1%	12.6%	1595.11	.000*
Energy foods help the baby to be strong	96.1%	20.2%	1250.72	.000*
Knowledge on times to wash hands (N)	**1680**	**420**	**2573.89**	**.000**
After defecating	88.3%	31.9%		
After cleaning a child who has defecated	86.0%	12.6%		
Before preparing food	94.8%	45.0%		

	Intervention Blocks	**Non-Intervention Block**		
Practices of Mothers/Care Givers	**%**	**%**	**Chi Sq Value**	**Level of Significance**
Women eligible for ANC (N)	1623	419		
ANC received	**95.7%**	**93.6%**	**3.34**	**.068**
Question asked for Diarrhea (N)	1661	420		
Incidence of Diarrhoea	**9.2%**	**13.6%**	**9.354**	**.009***
Diarrhea Management				
Given to drink during the diarrhea, including breast milk (N)	**153**	**57**	**7.646**	**.054**
Not breastfed during the episode	7.8%	10.5%		
Less than usual	39.9%	56.1%		
Same as usual	32.0%	26.3%		
More than usual	20.3%	7.0%		
Given to eat during the diarrhoea (N)	**153**	**57**	**35.91**	**.000***
Never gave food	9.2%	8.8%		
Less food	42.5%	86.0%		
Same amount of food	28.1%	5.3%		
More food	20.3%	0.0%		
ORS given (Pre-packaged or locally made or home-made)	**88.9%**	**52.6%**	**32.96**	**.000***
Health worker gives messages on (N)	**1625**	**358**	**1985.67**	**.000***
ANC care and PNC care of mother and child	88.2%	35.2%		
Danger signs during pregnancy and post-partum	77.4%	24.6%		
Contraceptive methods	67.3%	4.5%		
Complementary feeding	86.6%	26.0%		
Handwashing	93.7%	88.3%		
Benefits of toilet use	66.2%	45.8%		
***p<.05**				
Before feeding a child	94.3%	57.9%		
Before Eating	94.9%	88.6%		

Table 3 shows other than receiving ANC and liquids given during diarrhea

Table 3 shows Association between practices of the mothers/caregivers and implementation of care group model. Table 3 below shows other than receiving ANC and liquids given during diarrhoea, the association between areas studied-intervention or non-intervention, and practices reported by the community mothers/caregivers is statistically significant.

DISCUSSION

The results were encouraging as it was found that knowledge and practice of the desired behaviours were better in intervention areas. Similarly, mothers of intervention areas were found to be better at managing Diarrhoea, i.e., they had better knowledge on giving an increased amount of liquid, food and ORS during diarrhoeal episode. The proportion of mothers reporting about health messages given by health workers was also more in intervention area than non-intervention area. Performance of some of the important indicators were not found to be improved significantly in the population, even after the intervention. One of them is, knowledge on family planning method among women of reproductive age. A study knowledge and eventually use of contraceptives among the tribal women are considerably lower as compared to their non-tribal counterparts [10]. Level of literacy and increasing age are apparently major factors influencing acceptance of family planning methods [11]. Findings from a study in the neighbouring state Chhattisgarh suggests that awareness do not necessarily lead to usage of contraceptives [12]. Similarly, in our study it was observed that preference to male child has led to more use of spacing method instead of limiting method among these women. In such cases, awareness regarding gender equality, population explosion and increased accessibility to all kinds of contraceptives can be an effective interventions. Inconsistent with our findings, factors such as social norms, caste, gender-based power dynamics, belief system etc. are evidently influencing the behaviour [13, 14].

Care group model is a very effective approach for instigating and sustaining behaviour change in any population. Contextual factors such as cultural practices and norms which are acting as barriers need to be identified and facilitated for change. For instance, adequate utilization of ANC services and breastfeeding practices is affected by the family's support, mother's knowledge, the parent's education, employment, living environment etc. [15, 16]. Addressing such factors aids to sustain the initiated improvements and achieving long-term results impacting health.

Health communication in a large cohort of people lead to behaviour change among the population simultaneously. Health communication increases health literacy which ultimately lead to community engagement, potential to interpret healthcare messages and patient-provider quality encounter [17]. Taggart et al. has also conveyed in their study that way of transmitting healthcare messages influence attitude and practices [18]. Similarly, Health inequity can also be addressed by focusing on the delivery of correct scientific health information to the society.

Community engagement and administrative support are at the roots of success of any public health programme and so for this approach. Increased health consequences, health behaviour self-efficacy and improved perceived social support of healthcare intervention are some of the outcomes of community engagement and providing ownership to the beneficiaries [19]. Therefore, identification of enablers and barriers to community and political or administrative or institutional synergies is necessary prior to fully-fledged implementation of community healthcare models [20].

The results could be viewed as evidence of the effectiveness of the care group approach. The implementation of the model could be continued and expanded by focusing on key aspects which emphasize the importance of the universal message and also identification of the concepts and construct which play a role in its success so that the lessons could be integrated into other behaviour-change efforts.

CONCLUSION

As far as baseline and end-line comparison is considered, there was an improvement in both intervention and non-intervention areas, however, the improvement was manifold in intervention areas. The results could be viewed as evidence of the effectiveness of the care group approach. A few improvements could be made to collaborate more with the government system and train the volunteers so that uniform messages could be delivered, and implementation is further strengthened. Because of the encouraging results, the approach could be up scaled to other areas so that the health of the mother and child could be positively benefited by brining-in desired behaviour change. The implementation of the model could be continued and expanded by focusing on key aspects which emphasize the importance of the universal message and also identification of the concepts and construct which play a role in its success so that the lessons could be integrated into other behaviour-change efforts.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: The authors would like to thank Ms.Srilekha Chouhan (Technical Specialist) for her technical support, Project team of Narla, Sambalpur, Khariar and Loisingha for implementing this program and support in data collection. We also thank Mr.Marseibor Lyngdoh, Associate Director, and Bhubaneshwar, India for providing overall support to implement this program and research. We would also like to thank Dr. Deepak Kumar Behera (Ph.D), Assistant Professor from Department of Economics, Birla Global University, Bhubaneshwar and Ms. Sanghamitra Mishra, Project Co-ordinator, Doctors for You, Bihar for their contribution in writing this manuscript at free of cost

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Emershia Sharmine, Subramania Siva, Ciju Daniel. Implementation research on the effectiveness of care group model in improving knowledge and practices of MCHN services by community mothers in India. *Int J Health Sci Res.* 2023; 13(5):156-165. DOI: *https://doi.org/10.52403/ijhsr.20230517*

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