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The Role of IPC Visit Frequency in Enhancing Infant Feeding Knowledge and Practices among Mothers in Rajasthan

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Abstract

Introduction

Child malnutrition remains a pressing public health concern in India, particularly in resource-limited regions like Rajasthan. Despite improvements in the economy and healthcare access, undernutrition continues to persist, as seen in India's ranking on the Global Hunger Index. Good Infant Child Feeding Practices (IYCF), such as exclusive breastfeeding and timely complementary feeding, are critical for child survival and healthy development. However, knowledge and service gaps among mothers, especially regarding feeding practices, remain significant challenges.

Objectives

This study examines how Interpersonal Communication (IPC) by Frontline Health Workers (FLWs) influences maternal knowledge and practices related to IYCF in Rajasthan. It aims to understand whether frequent IPC visits can bridge knowledge gaps and improve real-world feeding behaviors among mothers.

Methods

Using secondary data from the 2021 monitoring survey

across five districts, responses from 10,477 mothers of children under two years were analyzed. The Chi-square test was applied to assess the relationship between the frequency of IPC visits and maternal knowledge and practice regarding breastfeeding and complementary feeding.

Findings

Results revealed a strong positive link: Mothers receiving two or more IPC visits had significantly better knowledge and practice of early initiation of breastfeeding, exclusive breastfeeding, and timely complementary feeding. However, dietary diversity and meal frequency remained areas needing attention.

Conclusion

Strengthening IPC efforts by enhancing FLW outreach, standardizing counseling, leveraging digital tools, and building community support can drive better IYCF outcomes, promoting improved child nutrition and long-term health in Rajasthan and similar settings.

Keywords: Infant Child Feeding Practice (IYCF), Interpersonal Communication (IPC), Frontline Health Worker (FLW).

Introduction

Undernutrition among children is a long-standing worldwide health issue with far-reaching implications for physical and mental development, death rates, and economic productivity. Despite global efforts, malnutrition, in the form of stunting, wasting, and being underweight, continues to contribute to almost half of all childhood deaths, and research indicates that inadequate nutrient intake is responsible for 45% of such deaths, as shown by **WHO (2003)** ^[1]. It is mostly in the first year of life that these deaths occur, typically being caused by poor complementary feeding practice. Even India with all its economic and technological advancement has a very high malnutrition emergency ranking 105th in the 2024 Global Hunger Index, as shown by **Gragnolati et al. (2005)** ^[2]. The National Family Health Survey (NFHS-5) findings reveal a general improvement in Infant and Young Child Feeding (IYCF) practice, but this improvement is uneven among states, as highlighted by **IIPS (2019-2021)** ^[3]. In Rajasthan, the rates of breastfeeding have enhanced, but complementary feeding practices remain behind, creating concerns regarding the overall nutritional adequacy of the diet of children. This identifies the need for immediate interventions aimed at leveraging gains in breastfeeding while enhancing complementary feeding strategies.

Accepting the critical significance of IYCF practices in early childhood, studies point to the first 1,000 days of life as a critical period for growth and development, as mentioned by *Kanti et al. (2019)*^[4]. Exclusive breastfeeding for the first six months and later timely and adequate complementary feeding are critical in preventing stunting and micronutrient deficiencies, as described by *Victora et al. (2016)*^[5], *Begin et al. (2017)*^[6], and *Michaelsen et al. (2017)*^[7]. Compliance with correct IYCF enhances infant survival, cognitive, and immunity development and minimizes risks of obesity, diabetes, and infection as shown by *Victora et al. (2016)*^[5]. Exclusive breastfeeding for the first six months and continued breastfeeding with complementary foods up to at least two years of age is promoted by the World Health Organization, as highlighted by *WHO (2021)*^[8]. Even with this, improper feeding continues to cause child malnutrition and subsequently stunted growth, poor performance at school, and long-term economic and health impacts, as mentioned by *Black et al. (2008)*^[9], *Crookston et al. (2011)*^[10], and *Alderman et al. (2006)*^[11]. In India alone, if exclusive breastfeeding for all was guaranteed and followed by proper complementary feeding, up to one-fifth of children's lives would be saved, as shown by *Aayog et al. (2017)*^[12]. All this emphasizes the need for a comprehensive strategy in favor of promoting the best feeding behavior.

Interpersonal communication (IPC) and counseling interventions are effective in improving IYCF practices. IPC is a priority component of breastfeeding promotion according to the WHO, recommending counseling during postnatal and antenatal care, as shown by *WHO (2018)*^[13]. Evidence from South Asian studies, such as India, indicates that health worker education greatly raises breastfeeding and food diversity, as shown by *Benedict et al. (2018)*, *Lamstein et al. (2014)*^[15], and *Mahumud et al. (2022)*^[16]. Alive & Thrive programme in Bangladesh exhibited notable shifts in dietary patterns as a result of extensive media campaigns and counseling, as described by *Menon et al. (2016)*^[17]. IPC interventions coupled with active involvement of the community have successfully been able to promote IYCF practices by implementing respectful and tailored communication approaches, as explained by *Ickes et al. (2017)*^[18] and *Smith et al. (2022)*^[19]. This study examines the contribution of IPC Visit Frequency towards mother's understanding and practice related to infant feeding pattern in Rajasthan.

Methods

This study used secondary data from a 2021 cross-sectional survey in the RajPusht program in Rajasthan's five districts: Baran, Banswara, Dungarpur, Pratapgarh, and Udaipur. RajPusht was a project to reduce low birth weight and wasting in children through behavior change messaging combined with cash transfer to pregnant women and mothers as a replacement for ICDS Take-Home Rations. Data were collected from 10,477 mothers of children under two with a sample of 2,095 respondents per district who were selected between 105 randomly selected villages. The survey covered exposure to behavior change communication (BCC), maternal, infant, and young child nutrition (MIYCN) practice, cash support, pregnancy weight gain, and child growth.

Exposure to IPC is where the mothers have been visited by frontline workers (AWWs, ASHAs, or ANMs) in terms of

health-related visits during three months before the survey. For ANMs, a visit can be at home or elsewhere.

Breastfeeding and Complementary Feeding Practices follow WHO's 2010 guidelines for IYCF, promoting exclusive breastfeeding for six months followed by safe and adequate complementary feeding with ongoing breastfeeding until at least two years of age.

Data were analyzed using the STATA statistical package. The study aimed at establishing the association between breastfeeding and complementary feeding maternal knowledge and practices and IPC visit frequency among children aged less than two years. This was done using a Chi-square test.

Results

Socio-demographic profile

The socio-demographic profile of Rajasthan mothers with children aged below two offers valuable information on the context of interpersonal communication (IPC) interventions. Most mothers are young, with 60.8% aged between 20–24 years and 27.0% aged between 25–29 years. Educational attainment is generally low, with 22.8% of them not being educated and only 9.5% possessing a Bachelor's degree and above. The community is predominantly Hindu (97.1%), with a significant representation from Scheduled Tribes (63.1%) and Other Backward Classes (20.2%). The economic composition is heterogeneous with 50.1% of the families holding Above Poverty Line (APL) ration cards and 39.2% Below Poverty Line (BPL), which shows economic heterogeneity among the sample of this study.

Frequency of Interpersonal Communication (IPC)

Frequency of interpersonal communication was defined as instances where mothers received home visits from frontline workers during which health-related messages were discussed. One-third (33.5%) of mothers received three or more visits, followed by two visits (23.8%) and one visit (7.6%), while 35.2% of mothers reported that they did not receive any IPC visits, as shown in Fig 1.

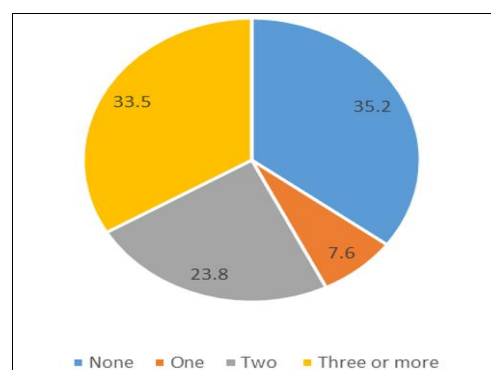


Fig 1: Frequency of Interpersonal Communication Exposure (%)

Knowledge of IYCF by Frequency of Interpersonal Communication Exposure

The research identifies a positive correlation between visits of interpersonal communication (IPC) and mothers' knowledge concerning Infant and Young Child Feeding (IYCF) practices. Mothers with two or more IPC visits had higher awareness concerning giving the baby only colostrum or mother's milk at birth, with their awareness ranging from 95.8% to 97.3% ($p < 0.001$), giving emphasis to the positive impact of frequent IPC contact.

The same was observed in initiation of breastfeeding knowledge, with more accurate responses after IPC exposure. Whereas 83.9% of the mothers who had no IPC visits correctly cited the timing, 97.8% of those who had three visits got it right ($p < 0.001$). Likewise, knowledge on the correct time to introduce complementary foods was greater from 23.4% among mothers with no IPC visits to 31.8% among those with three visits ($p < 0.001$).

In addition, awareness of appropriate complementary foods to be introduced after six months of age was considerably higher among mothers with higher IPC exposure. Knowledge increased from 89.5% in the no IPC visit group to 98.9% in the three IPC visits group ($p < 0.001$), further supporting the intervention role of IPC in enhancing IYCF practice understanding among mothers, as shown in Fig 2.

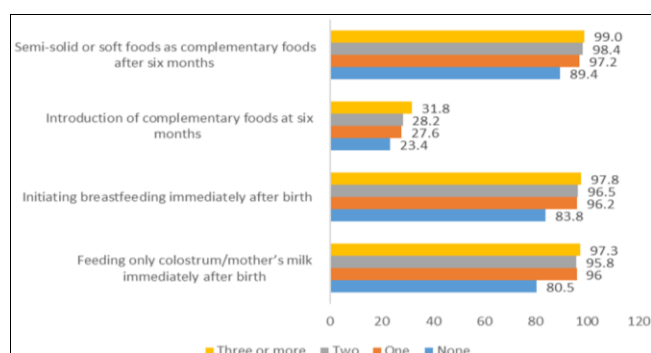


Fig 2: Knowledge of IYCF by Frequency of IPC Exposure

IYCF Practices by Frequency of Interpersonal Communication Exposure

The findings show a high correlation between the number of interpersonal communication (IPC) visits and key Infant and Young Child Feeding (IYCF) practices. Initiation of breastfeeding early on increased with increasing IPC exposure, from 74.4% among mothers who had no IPC visits to 87.8% among those with three visits ($p < 0.001$). Exclusive breastfeeding also increased from 69.4% among mothers with no IPC visits to 80.8% among those with three visits ($p < 0.001$).

The introduction of semi-solid foods was also significantly related to IPC visits, rising from 23.3% where there was no IPC exposure to 43.5% in the case of three visits ($p < 0.001$). Likewise, minimum dietary diversity rose from 20.0% to 32.7% as frequency of IPC exposure increased ($p < 0.001$).

While frequency of IPC visits had a modest impact on minimum meal frequency and minimum acceptable diet, the differences were not statistically significant. Minimum meal frequency rose marginally from 24.3% in the no IPC visit group to 30.1% in the three-visit group ($p = 0.109$). Similarly, the proportion of mothers achieving the minimum acceptable diet rose marginally from 5.7% to 8.0% with increased IPC exposure ($p = 0.584$), as shown in Fig 3.

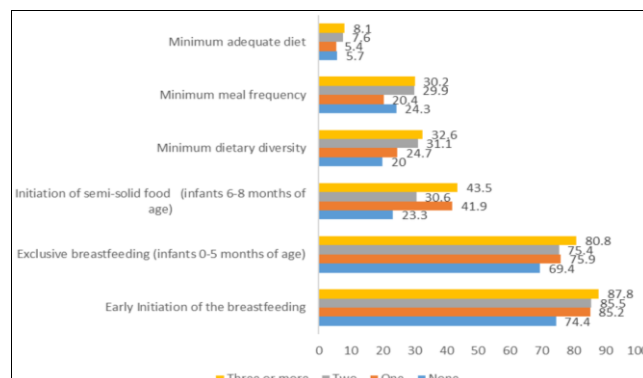


Fig 3: Practice of IYCF by Frequency of IPC Exposure

Discussion

Building Maternal Knowledge through IPC Visits

The findings of this study emphasize the primary role of interpersonal communication (IPC) visits in increasing maternal knowledge of Infant and Young Child Feeding (IYCF) practices. Mothers with more frequent IPC visits had a statistically significant level of awareness regarding early initiation of breastfeeding, exclusive breastfeeding, and appropriate complementary feeding practices. This is consistent with previous studies that report the effectiveness of direct counseling and interpersonal communication in improving maternal knowledge of nutrition (WHO, 2018; Benedict, 2018b) [13, 14].

Most crucially, initiation of breastfeeding and colostrum feeding awareness was greatly increased with exposure to IPC. While 83.9% of mothers who received no IPC visits correctly identified when to initiate breastfeeding, 97.8% of mothers who had three IPC visits did the same. This suggests that frequent exposure through IPC interventions reinforces essential messages so that mothers can acquire evidence-based feeding practices. Besides, awareness regarding timely complementary feeding—another sphere of considerable misinformation—was likewise found to correlate positively with the frequency of IPC visits. Though only 23.4% of the women with zero IPC visits were aware that six months was the optimal time to begin complementary foods, this was, however, brought up to 31.8% among women with three visits. All the above findings simply highlight the urgency of scaling up IPC interventions such that maximum reach is made to areas where complementing feeding norms are still deficient.

Strengthening IYCF Practices Through IPC Interventions

Aside from knowledge acquisition, IPC visits were also discovered to have a major impact on IYCF practices. Initiation of breastfeeding early, exclusive breastfeeding, and timely introduction of semi-solid foods all increased as IPC exposure level increased. As an example, the percentage of mothers practicing initiation of breastfeeding

early increased from 74.4% among the group with zero IPC visits to 87.8% among the group with three visits. Similarly, exclusive breastfeeding rates improved from 69.4% to 80.8%, indicating the effect of multiple IPC interactions in closing the knowledge to practice gap.

But although there were improvements in the majority of the important feeding practices, gaps in meal frequency and dietary diversity persisted. Minimum diet diversity was increased from 20.0% among mothers with no IPC visits to 32.7% among mothers with three visits, but overall compliance was low. Similarly, the percentage of children who achieved minimum meal frequency increased marginally with IPC exposure but was not significant. These findings suggest that IPC interventions are effective to promote early initiation of breastfeeding and exclusive breastfeeding but that additional strategies may be necessary to close complementary feeding gaps. Combining IPC with community demonstrations, peer support groups, and mass media campaigns may help to reinforce best feeding practices following breastfeeding.

Addressing Barriers to IPC Effectiveness

While IPC visits have a positive impact, there are certain aspects that can negate their effectiveness. Variations in frontline worker (FLW) training, visit frequency, and messaging quality can influence outcomes. ASHA and AWW workers conducted the bulk of IPC visits in this study, but variation in counseling content and delivery may have accounted for inconsistent knowledge retention and behavior uptake. Strengthening FLW training programs and standardizing IPC messaging might improve these interactions.

Furthermore, economic conditions, cultural beliefs, and family dynamics also affect IYCF uptake. While IPC visits improved breastfeeding behaviors, deeply rooted feeding practices—such as late complementary feeding or the use of traditional foods—may hinder complete uptake of WHO-recommended guidelines. Integration of IPC interventions with social and behavior change communication (SBCC) strategies that address cultural norms and family decision-making may increase their effectiveness further.

Policy and Programmatic Implications

The strong correlation between IPC frequency and increased IYCF practices and knowledge underscores the need to focus policy interventions to expand IPC outreach. Scaling up home-based counseling via IPC, increasing FLW training, and integrating IPC into larger maternal and child health programs can help build coverage and impact. Policymakers should also consider the potential for using digital platforms—mobile-based counseling and follow-up reminders—to complement doorstep visits and promote key messages on nutrition.

Besides, targeted interventions need to address long-standing deficiencies in complementary feeding. Because minimum diet diversity and minimum acceptable diet compliance were low, IPC programs need to address individualized counseling on the appropriate foods, amount of food, and feeding frequency. Leverage community platforms such as self-help groups and mother support groups can provide peer support and bridge socio-cultural barriers to optimal feeding.

Conclusion

This research highlights the significant contribution of IPC visits to maternal knowledge enhancement and optimal IYCF practice promotion among Rajasthan mothers. Increased exposures to IPC were significantly linked with enhanced initiation of breastfeeding, exclusive breastfeeding, and complementary feeding knowledge. Meal frequency and dietary diversity gaps remain, highlighting the need for complementary interventions. Strengthening IPC service delivery, overcoming cultural barriers, and integrating technology-based solutions can optimize maternal engagement and sustained adherence to recommended IYCF practices. These results provide useful recommendations to policymakers and program implementers who aim to optimize child nutrition benefits within contexts of limited resources.

Data Availability: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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