

Impact of Educational Intervention to Mothers or Caregivers on the Stunting Status of their Under-Five Children in the Adopted Villages of a Teaching Hospital in the District of Bareilly

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ABSTRACT

Introduction: Infant and young child feeding (IYCF) guidelines ensure healthy growth, development, and long-term well-being during the most critical period of a child's life. The prevalence of stunting in Bareilly, Uttar Pradesh, is 45.9%.

Material and methods: A community-based intervention study was conducted with mothers or caregivers of under-five children in five villages of Bareilly District, and the villages were randomly assigned to intervention (290 mothers/caregivers) and control (280 mothers/caregivers) groups. Data were collected using a pre-tested interview schedule on IYCF practices based on WHO guidelines. Statistical analysis was performed using SPSS version 25.

Results: Breastfeeding was done by 260 (89.66%) of children under 5 years in the intervention group, and 250 (89.66%) under 5 children in the control group ($p = 0.890$), but exclusive breastfeeding was carried out by 126 (43.45%) of the intervention group and 116 (41.43%) of the control group mothers ($p = 0.630$). The prevalence of stunting was 570 (100%), and after the intervention, this rate improved to 245 (42.98%) for stunting ($p = 0.000$).

Conclusion: The current study concludes that the prevalence of malnutrition in the selected population was very high. The awareness and educational interventions brought about success in reducing malnutrition in children under 5.

Keywords: Nutrition, Intervention, IYCF practices, Stunting, Breastfeeding, Awareness

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INTRODUCTION

The first 1,000 days of a child's life, from pregnancy to their second birthday, are crucial for their growth, development, and health.¹ Good nutrition leads to better health for infants, children, and mothers.² Malnutrition can impact people of all ages, but it is especially harmful to children, as it may cause developmental delays and health issues. The nutrition of children under five is a key measure of a household's well-being and plays a crucial role in their survival.³

Infant and young child feeding (IYCF) is a set of important guidelines for feeding babies and young children under two, which help ensure healthy growth, development, and well-being during this critical stage.⁴ These practices encompass exclusive breastfeeding, complementary feeding, the types and frequency of foods introduced, and overall child care.⁵

The Family Adoption Program is a special initiative in the undergraduate medical curriculum that gives students early exposure to communities, familiarizes them with rural healthcare settings, and helps provide essential health support to underserved populations. It is a true example of the symbiotic relationship between the two parties, the MBBS students as well as the community.⁶

According to WHO estimates, by 2025, the global number of stunted children is expected to reach 131 million, which is 27 million more than the anticipated 40% reduction target.⁷ The prevalence of wasting is projected to stay significantly higher than the 5% target.⁷

National representative data from the National Family Health Survey 5 (NFHS-5), in 2019-2020, 35.5% of children under five years of age were found to be stunted. The prevalence of stunting in Bareilly, Uttar Pradesh, is 45.9%.⁸ The current under-five mortality rate in India is 28/1000 live births, and undernutrition is one of the significant contributors to under-five mortality in India.⁹

Available literature shows few intervention studies conducted to generate evidence for the effect of educational intervention on the stunting status of under-five children. In this context, the objective of the study is to evaluate the impact of educational interventions

targeting mothers or caregivers on the stunting status of under-five children in the adopted villages of the teaching hospital in District Bareilly. This study seeks to explore whether such interventions can effectively improve feeding practices, increase awareness about proper nutrition, and ultimately enhance the nutritional health of children in these rural communities.

MATERIAL AND METHODS

Study Design and Setting

A community-based interventional study was carried out in five villages adopted by the SRMS IMS in Bareilly under the family adoption program conducted over 18 months from 1st May 2023 to 31st October 2024. The study focused on mothers or caregivers of all under-five children registered at the respective Anganwadi centers in these villages. The study included mothers or caregivers of under-five children who were registered at their respective Anganwadi centers, were permanent residents of the village for at least six months, and provided informed consent to participate. In households with multiple under-five children, the youngest child was selected for the study.

The study excluded mothers or caregivers of under-five children with a previously diagnosed disability and those who were unavailable for two consecutive home visits conducted two days apart.

Study Tools

Data collection was carried out using a pre-designed and pre-tested semi-structured interview schedule based on the WHO standard interview schedule for IYCF practices. Anthropometric measurements were taken using an infantometer, an inch tape, a digital weighing scale, and Shakir's tape. Nutrition education was provided through video demonstrations and covered topics such as IYCF practices, immunization schedules (from birth to 5 years, including catch-up immunization), family health education, and the use of growth charts.

Statistical Analysis

Data was entered in MS Excel spreadsheet 2019 and analyzed in SPSS Trial version 25. Descriptive statistics were used to summarize the demographic and socioeconomic profile of the study participants. Continuous variables were presented as mean and standard deviation, while categorical variables were summarized using frequencies and percentages. Bivariate analysis was conducted using the chi-square test for categorical variables. Pre- and post-intervention changes in nutritional indicators were evaluated using chi-square tests for categorical variables. A significance level of $p < 0.05$ was considered statistically significant.

RESULTS

Figure 1 presents the baseline socio-demographic characteristics of mothers or caregivers in the intervention and control groups. The majority in both groups were aged 24 to 26 years: 142 (48.97%) out of 290 in the intervention group and 128 (45.71%) out of 280 in the control group. The age distribution showed no statistically significant difference ($p = 0.57$).

Regarding religion, 197 (67.93%) mothers in the intervention group were Muslim and 93 (32.07%) were Hindu, compared to 179 (63.93%) Muslims and 101 (36.07%) Hindus in the control group ($p = 0.31$). For caste, 192 (66.21%) in the intervention group and 178 (63.57%) in the control group were OBC ($p = 0.70$). Socioeconomic status was also similar, with 165 (55%) in the intervention group and 153 (54%) in the control group belonging to class IV ($p = 0.59$). Most families were nuclear: 224 (77.24%) in the intervention group and 221 (78.93%) in the control group ($p = 0.63$). Overall, socio-demographic variables were well balanced between the groups.

Figure 2 compares the characteristics of under-five children. Most children were aged 13 to 24 months: 139 (47.93%) in the intervention group and 144 (51.43%) in the control group ($p = 0.61$). Males were the majority in both groups: 150 (51.72%) in the intervention and 147 (52.50%) in the control ($p = 0.85$). Second-born children were most

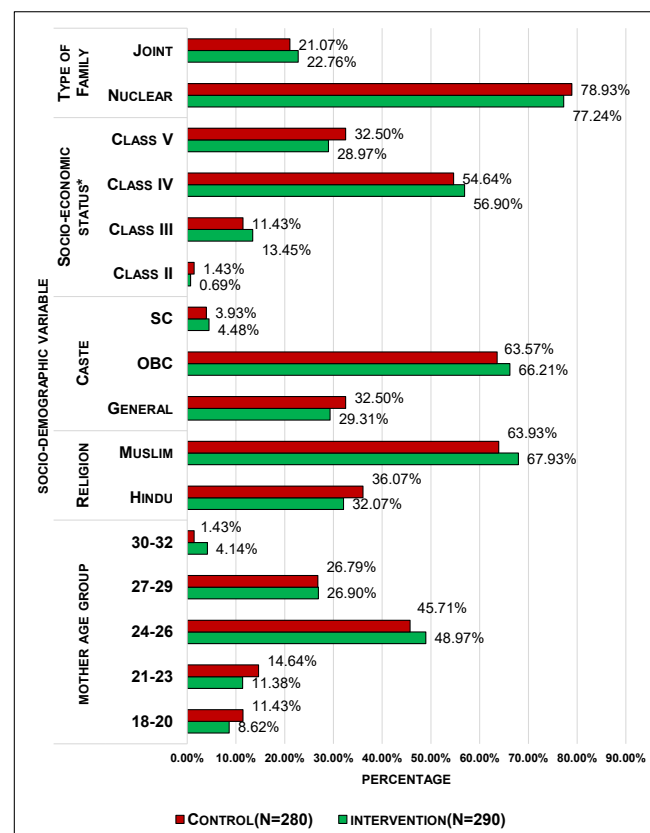


Figure 1: Socio-demographic distribution of the study participants of different groups [570(N) = 290(n₁) + 280(n₂)]

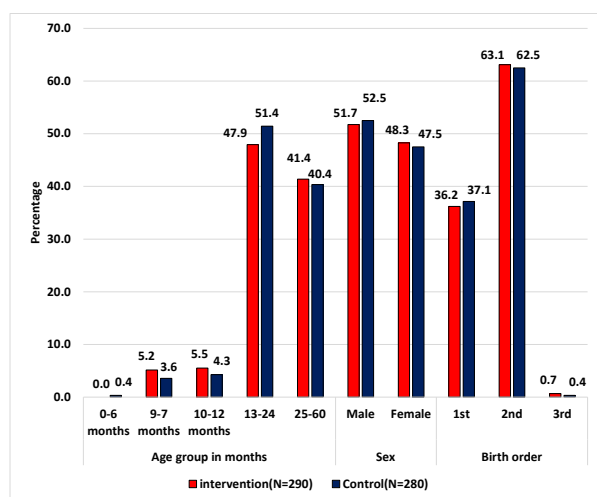


Figure 2: Baseline comparison of under 5 children characteristics in the intervention and control groups [570(N) = 290(n₁) + 280(n₂)]

common: 183 (63.10%) in the intervention and 175 (62.50%) in the control group ($p = 0.84$). None of these differences were statistically significant.

Table 1 compares breastfeeding history. In the intervention group, 260 (89.66%) children were ever breastfed, compared to 250 (89.29%) in the control group ($p = 0.89$). Exclusive breastfeeding under six months was reported in 126 (43.45%) in the intervention group and 116 (41.43%) in the control group ($p = 0.63$). These differences were not statistically significant.

Table 2 presents baseline stunting status. In the intervention group ($n = 290$), 69 (23.79%) were mildly stunted, 111 (38.28%) moderately stunted, and 110 (37.93%) severely stunted. In the control group ($n=280$), 53 (18.93%) were mildly, 88 (31.43%) moderately, and 139 (49.64%) severely stunted. The distribution of stunting

Table 1: Baseline comparison of under-5 children based on their breastfeeding history up to 6 months in the intervention and control groups [570(N) = 290(n₁) + 280(n₂)]

Variable	Category	Intervention group	Control group	Total	p-value [§]
Child ever breastfed	Yes	260 (89.66%)	250 (89.29%)	510 (89.47%)	0.890
	No	30 (10.34%)	30 (10.71%)	60 (10.53%)	
Exclusive Breastfeeding	Yes	126 (43.45%)	116 (41.43%)	242 (42.46%)	0.630
	No	164 (56.55%)	164 (58.57%)	328 (57.54%)	

* $p < 0.05$ (statistically significant)

§Chi-square test applied

Table 2: Baseline comparison of the stunting status of under 5 children in the intervention and control groups[570(N) = 290(n₁) + 280(n₂)]

Stunting	Intervention group	Control group	Total	p-value [§]
Mild	69 (23.79%)	53 (18.93%)	122 (21.40%)	0.020*
Moderate	111 (38.28%)	88 (31.43%)	199 (34.91%)	
Severe	110 (37.93%)	139 (49.64%)	249 (43.68%)	
Total	290 (100.00%)	280 (100.00%)	570 (100.00%)	

* $p < 0.05$ (statistically significant)

§Chi-square test applied

Table 3: Comparison of stunting at 6 months duration from baseline in intervention and control group

Stunting	Baseline	Total	6 months			p-value [§]
			Mild	Moderate	Severe	
Intervention group (n ₁ = 57)	Mild	15	15	0	0	0.000*
		100.00%	100.00%	0.00%	0.00%	
	Moderate	19	19	0	0	
		100.00%	100.00%	0.00%	0.00%	
	Severe	23	0	8	15	
		100.00%	0.00%	34.80%	65.20%	
Control group (n ₂ = 280)	Mild	53	53	0	0	0.000*
		100.00%	100.0%	0.0%	0.0%	
	Moderate	88	88	0	0	
		100.00%	100.0%	0.0%	0.0%	
	Severe	139	0	45	94	
		100.00%	0.0%	32.4%	67.6%	

* $p < 0.001$ (highly statistically significant)

#No under-5 children present in the normal category in both the intervention and the control group at baseline and 1st follow-up

§Chi-square test (Yates's correction) applied

was significantly different between the two groups ($p = 0.02$), with a higher proportion of severe stunting in the control group.

Table 3 shows stunting changes after six months. In the intervention group ($n = 57$), of the 15 children mildly stunted at baseline, all remained mildly stunted. Among the 19 with moderate stunting, all remained the same. Of the 23 severely stunted, 8 (34.8%) improved to moderate, while 15 (65.2%) remained severe. No children worsened in stunting status.

In the control group ($n = 280$), all 53 mildly stunted children remained mild. All 88 moderately stunted children stayed the same. Among the 139 severely stunted, 45 (32.4%) improved to moderate, and 94 (67.6%) remained severely stunted. No improvement in mild stunting occurred in either group. The changes in stunting from baseline to 6 months were statistically significant ($p < 0.001$), indicating a meaningful intervention effect.

DISCUSSION

The current study included a total of 570 participants, with 290 in the intervention group and 280 in the control group. Most participants in both groups were classified as OBC (Other Backward Classes), with 192 (66.21%) in the intervention group and 178 (63.57%) in the control group, while a study carried out by Acharya A. *et al.* in which, 32% were from OBC, 29% from ST, 23% from SC, and 17% from the non-SC/ST/OBC category. This highlights the impact of caste on the nutrition of under-5 children.¹⁰

The current study shows that the prevalence of stunting is 570 (100%). In the intervention group, 111 (31.38%) and 88 (31.43%) in the control group were affected by moderate stunting, while 110 (37.93%) in the intervention group and 139 (49.64%) in the control group had severe stunting, with a significant difference favoring the intervention group. According to NFHS-5 (Uttar Pradesh), 41.3% of children are stunted. Similar findings were reported by Gupta S *et al.*, who observed that malnutrition was most common in the 13 to 48-month age group (81.39%) and least common in the 0 to 12-month age group (6.97%).³

The current study shows that 260 (89.66%) of children had ever been breastfed in the intervention group and 250 (89.29%) in the control group were breastfed, with no significant difference between the two groups ($p = 0.89$). For exclusive breastfeeding awareness, 220 (75%) of the intervention group mothers reported knowing about exclusive breastfeeding. A study was carried out by Admasu J *et al.* and observed that exclusive breastfeeding practice was significantly higher among women who received breastfeeding education than those who did not receive 74.1 and 60.6%, respectively ($p = 0.015$).¹¹ A study

by Dulal S. *et al.* observed that almost all children aged 0 to 12 months were ever breastfed (99%) and most children aged 0 to 5 months (89%) were exclusively breastfed.¹² Similarly, Choudhary K *et al.* in their study show that 96.5% of cases and 97.2% of controls were breastfed. Khandelwal S *et al.* in their study found that about 85.8% of children were found to be exclusively breastfed at one month, and 47.3% continued this exclusive breastfeeding till six months.¹³ While Dey R *et al.* found that 63.4% of mothers had knowledge about EBF, and 52.5% of the children were EBF.¹⁴

The current study shows that the prevalence of stunting was 570 (100%), and after the intervention, this rate improved to 245 (42.98%) for stunting. Similar results were seen in other studies. Addo OY *et al.* found that the children who received ≥ 3 months of SQ-LNS batch distributions had a significantly higher adjusted mean LAZ (+0.40, $p = 0.03$) than children who did not receive SQ-LNS.¹⁵ Yao S. *et al.* show that the prevalence of stunting was significantly lower in 2020, decreasing from 26.3 to 10.8%.¹⁶ Surve S *et al.* in their study showed a similar result that the prevalence of severe stunting significantly decreased by 17% in the post-intervention.¹⁷

CONCLUSION AND RECOMMENDATION

The current study concludes that the prevalence of malnutrition in the selected population was very high. The study concludes that the education intervention had a beneficial effect in reducing the burden of malnutrition in children under 5 in the community.

Continuous efforts to generate awareness about the correct feeding practice in the community are recommended. The mothers or caregivers of under-five children need continuous guidance and support to ensure exclusive breastfeeding until 6 months and the timely introduction of complementary feeding, including both the type of food and its frequency. The efforts to provide nutrition education to mothers or caregivers are vital in reducing the burdens of malnutrition in our country.

LIMITATIONS

Attrition of participants is a major issue in a prospective follow-up. Though in our study there were no dropouts from the intervention group, many participants in the intervention did not follow the intervention till the end of the study, remained a limitation of the current study.

REFERENCES

1. Guidelines and Minimum Standards for the Protection, Promotion and Support of Breastfeeding and Complementary

- Feeding; available at <https://www.unicef.org>. Accessed on 9/11/2024
2. World health statistics 2024: monitoring health for the SDGs, Sustainable Development Goals. Geneva: World Health Organization; 2024. License: CC BY-NC-SA 3.0 IGO.
3. Gupta S, Kumar D. An Intervention Study in Malnutrition among Under Five Children in a Rural Area of Jammu. 2013;15(2).
4. Enhancing-optimal-IYCF-practices.pdf. Available from: <https://nhm.gov.in/images/pdf/programmes/child-health/guidelines/Enhancing-optimal-IYCF-practices.pdf>. Accessed on 19/11/2024.
5. Saxena V, Verma N, Mishra A, Jain B. Assessment of Infant and Young Child Feeding (IYCF) practices in rural areas of Dehradun, Uttarakhand. J Fam Med Prim Care. 2022 Jul;11(7):3740–5
6. Family adoption program- A Soapbox for health educations 2024. Available from: <https://iapsm.org/blog/family-adoption-program-a-soapbox-for-health-education/>. Accessed on 19/11/2024.
7. De Onis M, Dewey KG, Borghi E, Onyango AW, Blössner M, Daelmans B, *et al*. The World Health Organization's global target for reducing childhood stunting by 2025: rationale and proposed actions. Matern Child Nutr. 2013 Sep;9(S2):6–26.
8. NFHS-5_Phase-II_0.pdf. Available from: https://mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf. Accessed on 19/11/2024
9. India achieves significant landmarks in reduction of Child Mortality. Available from: <https://pib.gov.in/Pressreleaseshare.aspx>. Accessed on 19/12/2024
10. Acharya A, Pradhan MR, Das AK. Determinants of minimum acceptable diet feeding among children aged 6–23 months in Odisha, India. Public Health Nutr. 24(12):3834–44.
11. Admasu J, Egata G, Bassore DG, Feleke FW. Effect of maternal nutrition education on early initiation and exclusive breastfeeding practices in south Ethiopia: a cluster randomised control trial. J Nutr Sci. 2022;11:e37.
12. Dulal S, Prost A, Karki S, Merom D, Shrestha BP, Bhandari B, *et al*. Feeding, caregiving practices, and developmental delay among children under five in lowland Nepal: a community-based cross-sectional survey. BMC Public Health. 2022 Sep 10;22(1):1721.
13. Khandelwal S, Kondal D, Chakravarti AR, Dutta S, Banerjee B, Chaudhry M, *et al*. Infant Young Child Feeding Practices in an Indian Maternal–Child Birth Cohort in Belagavi, Karnataka. Int J Environ Res Public Health. 2022 Apr 22;19(9):5088.
14. Dey R, Kumar M, Mukherjee D, Joardar GK. A study on infant and young child feeding practices and its associated factors among mothers of under two years old children attending the immunization clinic in a medical college of Kolkata. J Fam Med Prim Care. 2022 Nov;11(11):7222–5.
15. Addo OY, Locks LM, Jefferds ME, Nanama S, Albert B, Sandalinas F, *et al*. Combined infant and young child feeding with small-quantity lipid-based nutrient supplementation is associated with a reduction in anemia but no changes in anthropometric status of young children from Katanga Province of the Democratic Republic of Congo: a quasi-experimental effectiveness study. Am J Clin Nutr. 2020 Sep;112(3):683–94.
16. Yao S, Xiao S, Jin X, Xiong M, Peng J, Jian L, *et al*. Effect of a community-based child health counselling intervention on health-seeking behaviours, complementary feeding and nutritional condition among children aged 6–23 months in rural China: A pre- and post-comparison study. Matern Child Nutr. 2021 Nov 23;18(1): e13289.
17. Surve S, Kulkarni R, Patil S, Sankhe L, ICMR Co-ordinating Group. Impact of intervention on nutritional status of under-fives in tribal blocks of Palghar District in Maharashtra, India. Indian J Public Health. 2022;66(2):159.