

Minimum acceptable diet and stunting among children aged 6-23 months in Dalit and Non-Dalit and associated factors: A cross-sectional comparative study of Dhanusha district, Nepal

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Abstract

Background The complementary feeding practices contributes for development and survival of infant and young child, it reduces the risk of under-nutrition. The aim of the study assessed the status and identify factors associated with minimum acceptable diet and stunting among children aged 6-23 months in Dalit and Non-Dalit.

Methods The study method adopted cross-sectional comparative and conducted among mothers with their children aged 6-23 months children of Dhanusha district. Altogether 599 respondents were taken of which 299 were from Dalit and 300 from Non-Dalit and used multistage simple random sampling. Data collection techniques applied for interview and anthropometry measurement and structure questionnaire was practiced as a tool. Descriptive and inferential analyses were carried out by using Statistical Package for the Social Science.

Results The prevalence of minimum acceptable diet (MAD) and stunting were 43.8% and 49.9% among Dalit while 44.3%, and 39% among Non-Dalit. The MAD were significantly associated with the age of child (AOR=0.25, 95% CI: 0.11-0.54), child illness in the past two weeks (AOR=4.31, 95% CI: 1.56-11.88) and knowledge on child feeding (AOR=0.31, 95% CI: 0.16-0.61) among Dalit while age of child (AOR=0.37, 95% CI: 0.21-0.64), child illness in the past two weeks (AOR=4.80, 95% CI: 2.23-10.32, knowledge on child feeding (AOR=0.26, 95% CI: 0.16-0.42) and birth interval (AOR=1.92, 95% CI: 1.56-3.19) among Non-Dalit. Stunting was significantly associated with family types (AOR=1.93, 95% CI: 1.11-3.34) among Dalit while Ante Natal Care (ANC) visit (AOR=3.20, 95% CI: 1.15-8.90), media exposure (AOR=3.10, 95% CI: 1.11-8.64 and age of child (AOR=0.24, 95% CI: 0.10-0.57) in Non-Dalit.

Conclusion The proportion of minimum acceptable diet practices got similar in both groups. Being key associated factors of MAD practices, age of child, child illness and knowledge on child feeding existed in Dalit and Non-Dalit, while birth interval also among Non-Dalit. Similarly, family type provided an important factor of stunting in Dalit while age of child, ANC visit and media exposure among Non-Dalit. To improve the nutritional status among children, community based maternal nutrition education, access and utilization of health services should be recommended.

Background

Being essential, nutrition of children contribute to survive, to develop and to grow among children[1]. Undernutrition prejudices cognitive and physical development and enhances the risk for children mortality and morbidity[2]. Stunting, a major outcome of children development provide long term and irreversible profound effect on individual as well as society[3]. Child feeding practices, an important for child growth and development more ever helps to make lower morbidity and mortality for under two years[4] while inappropriate feeding practices direct to the risk of malnutrition[5]. More than two-thirds of malnutrition occurs during the golden 1000 days of life which is due to inappropriate feeding practices[6].

Worldwide, stunting, among 165 millions of children leads towards a serious public health concern[7]. Undernutrition among children enhances dominance in developing countries[8]. In past few decades of Nepal, the pattern of stunting has declined[9,10]. However, high proportions of the child of this age still remain affected which adds a serious public health concern of Nepal[1]. From the ancient time in Nepal, "Dalit" were considered as a schedule caste, poorest and untouchable[11]. Dalit is divided into two groups; Hilly Dalit and Terai Dalit in Nepal[11]. Terai Dalit includes Chamar/Harijan, Musahar, Dushad/Pasman, Tatma, Khatwe, Dhobi, Baantar, Chidimar, Dom and Halkhor whereas Hill Dalit includes Kami, Damai/Dholi, Sarki, Badi, Gaine and Unidentified Dalit[11]. People other than Dalit caste considers as Non-Dalits. The proportion of stunting was 37.4% at National level but it was high at the central Terai region (41.6%) among under-five aged children[12]. The proportion of minimum acceptable diet (MAD) was 18.9% in Dalit while it was 32.73% in Non-Dalit population[2]. Children of Dalit have lower MAD compared to Brahmin/Chhetri, Newar and Janajati[2].

Children of the golden 1000 days of age are prone to high risk groups of undernutrition. Insufficient complementary feeding[8], family types[13] age of child[14,15,16] maternal education[14,16,17] and knowledge on child feeding being the key factors have contributed to stunting. Furthermore, socio-demographic, health and knowledge are also associated with MAD such as Ante Natal Care (ANC) [15,18,19] age of a child[15,20,21], knowledge on child feeding[22,23] and child illness[20,24].

However, sufficient nutrition, a pre-requisite for sustainable development goal[25], gets a fundamental right of every child[26]. Appropriate follow a MAD with dietary diversity reduce the threat of stunting[7]. Improving child feeding practices pave the way for the highest priority program with an aim to improve children nutrition and health[27]. This study might give an important situation of stunting and minimum acceptable diet which could be baseline information for nutritional intervention. Thus, this study aims to assess the prevalence of minimum acceptable diet and stunting among children aged 6–23 months in Dalits and Non-Dalits and associated factors.

Methods

Study design and setting

A cross sectional comparative study was conducted in Dhanusha district of Nepal, between October 2016 to March 2017. The total area of the district covers 1,180 square kilometers and Maithili is the commonly spoken language[28]. The south part of the district is attached with the Bihar border of India. The selected Village Development Committees (VDC) covers about 5-30 kilometers East, North and South from headquarter (Janakpur).

Study population, Sample size calculation and sampling procedure

Children aged 6-23 months and their mothers in Dalit and Non-Dalit were the study population who were living in Dhanusha district. The sample size was calculated by using two population proportion groups [29]. The prevalence of minimum dietary diversity of Dalit and Non-Dalit was taken as 20.1% and 31.32% respectively[2]. By taking power 85%, level of significance 5% and non-response rate 5%, the sample size was 599, where 299 from Dalit and 300 from Non-Dalit. Multi-stage simple random sampling was applied in the study. Initially, three out of seven electoral constituencies were selected and three VDCs were chosen from each electoral constituency by randomly. Finally four wards out of nine wards of each VDC selected randomly by using lottery method. Bahedabela, Fulgama, Nagaraen, Dhabauli, Panchaharba, Sonigama, Sinujoda, Sapahi and Shantipur were picked VDCs. List of children aged 6-23 months were obtained from Vitamin A and Immunization registers. Furthermore, the proportional allocation was considered to estimate the number of children to participate in each selected ward. In the case of more than one child, the young child was purposively selected. Moher who had 18 years and above were involved in the study. Two repeated visits were made when mother-child pairs were not available at the time of data collection.

Data collection techniques, tools and procedure

Pre-testing was completed among 10% of the respondents in Bateshwar VDC. The data collection tool was adopted from Nepal Demographic Health Survey[9] and it was modified in the local context, the questionnaire was translated to the native language (Maithili) to maintain uniformity in the responses. Socio-economic and demographic, health, child feeding and anthropometry and information of mother/family were included in the questionnaire. Community Medical Assistants (CMA) were recruited as enumerators for data collection. Training was given to enumerators which contains the questionnaire, ethical consideration, anthropometric measurements and data collection techniques. Face to face interviews was conducted with child mothers by using structured questionnaire and child height was measured by recommended standard measuring instruments.

Data quality and safety

A day training was given to enumerators. Pretested tool was used and each day cross-checked was made for completeness, clarity, consistency and accuracy by researcher. Researcher himself was involved in the monitoring and supervision of enumerators' through the study. Password protected laptop was used for data entry and analyzed by one door system.

Data processing and analysis

Data were edited, coded and entered into the EpiData 3.1 version. The data was exported in SPSS 16.0 version for analysis. For anthropometry analysis, World Health Organization (WHO) anthropometry nutrition survey tool was used. Nutrition-related data were analyzed by using the WHO Anthro plus software 3.2.2 version. The Z-score of height-for-age (HAZ) was calculated, HAZ less than -2 standard deviations (SD) was defined as stunted from the reference population.

In the descriptive analysis, frequency and percentage were used to summarize the study variables. A binary logistic model was used to find out associated factors. P-value of <0.2 in bivariate analysis were entered to the multivariable analysis to control the possible effect of confounders[30]. Hosmer and Lemeshow Chi-square to get whether the model was fit. Enter method was used to see the independent association between dependent and independent variables. The adjusted odds ratio (AOR) with 95% confidence interval was used to notify the strength of association, and at 95% CI was used to declare the statistical significance in the multivariate analysis.

Ethical consideration

The research proposal was approved by the Institutional Review Committee of Institute of Medicine, Tribhuvan University, Maharajgunj; each respondent was informed on the objective, method and benefit of the study and written informed consent was taken before taking the interview. Using identifiable number, the confidentiality was maintained.

Results

Socio-demographic characteristics

A total of 599 respondents were taken, 299 from Dalit and 300 from Non-Dalit (Table 1). The mean age (\pm Standard Deviation, SD) children were 14.5(\pm 4.7) months in Dalit whereas 14.4 (\pm 4.6) months in Non-Dalit. The high proportion of children were female (56.9%) in Dalit while male (55.7%) in Non-Dalit. Most of Dalit child mothers were housewife (58.9%) followed by labour (24.1%) and were illiterate (83.0%) whereas Non-Dalit child mothers were housewife (66.0%) followed by agriculture (25.3%) and were illiterate (44.3%).

Knowledge, child health and feeding related characteristics

Nearly two-fifth of children had child illness in past two weeks in Dalit (19.4%) while in Non-Dalit (18.7%) (Table 2). Most of child mother had knowledge on child feeding in Dalit (51.8%) and Non-Dalit (60.0%). About two-fifth of children received minimum acceptable diet practices in Dalit (43.8%) whereas

in Non-Dalit (44.3%) (Table 2). Most of the female children had minimum acceptable diet practices in Dalit (47.6%) and Non-Dalit (38.8%) (Table 3). About half of children aged 12-23 months received MAD in Dalit (50.0%) and Non-Dalit (49.3%) (Table 3).

Child stunting related characteristics

The proportion of moderate and severe stunting among children were 31.8 % and 18.1 % in Dalit while 27.0 % and 12.0% in Non-Dalit respectively (Table 2). The prevalence of stunting (below minus 2SD) among children aged 6-23 months was 49.9% in Dalit while 39.0% in Non-Dalit. Besides, the prevalence of stunting was high among female children in Dalit (51.8%) and also in Non-Dalit (39.8%) (Table 3). About half of children were stunted among children aged 12-23 months (51.4%) and 9-11 months (51.0%) in Dalit. But two-fifth of children aged 12-23 months were stunted in Non-Dalit (42.9%).

Factors associated with minimum acceptable diet

The findings from multivariable logistic regression analysis indicated that the minimum acceptable diet practices were not found significantly associated with the sex of a child, father education, birth interval, family types, main source of family income and household owning agriculture land among Dalits (Table 4) while and family types, main source of family income, household owning agriculture land, ANC visit, place of delivery, Post Natal Care (PNC) visit, media exposure, number of child, and mother occupation in Non-Dalits (Table 5). The MAD practices were found less likely among children aged 6-11 months (AOR=0.25, 95% of CI: 0.11-0.54) in Dalit and (AOR=0.37, 95% of CI: 0.21-0.64) in Non-Dalit. The MAD practices were also found less likely among child mother who had knowledge of child feeding (AOR=0.31, CI: 0.16-0.61) in Dalit whereas (AOR=0.26, 95% of CI: 0.16-0.42) in Non-Dalit. The MAD practices were found higher among children who did not have illness than children who had illness among Dalit (AOR=4.31, 95% of CI: 1.56-11.88) while also higher Non-Dalit (AOR=3.02, 95% of CI: 1.35-6.73). The practices were also higher in the family with birth interval up to 2 years than more than 2 years in Non-Dalits (AOR=1.92, 95% of CI: 1.56-3.19).

Factors associated with stunting

The result of multivariable logistic regression analysis revealed that stunting were not significantly associated with knowledge on child feeding, ANC visit, media exposure and Timely Initiation of complementary feeding in Dalits (Table 6), while father education, birth interval, family types, household owning agriculture land, place of delivery, and mothers' occupation in Non-Dalits (Table 7). The stunting was found higher in children of single family (AOR= 1.93, 95% of CI: 1.11-3.34) compared to joint family in Dalits. Furthermore, it was found that stunting was also higher in child mother who did not have visit ANC (AOR= 3.20, 95% of CI: 1.15-8.90) than child mother who had visited ANC in Non-Dalit. Similarly, it was also found more likely among child mother who had not exposed to media as compare to child

mother who had exposed to media in Non-Dalits (AOR=3.10, 95% of CI: 1.11-8.64). In addition, the stunting was protected among children aged 6-11 months (AOR= 0.24, 95% of CI: 0.10-0.57) than children aged 12-23 months in Non-Dalit.

Discussion

The minimum acceptable diet gets a composite indicator of minimum dietary diversity and minimum meal frequency[31]. The findings revealed that the prevalence of MAD were about two-fifth among children aged 6–23 months in Dalit (43.8%) and Non-Dalit (44.3%). The similar, magnitude of MAD practices mentioned in NDHS 2016[10]. However, this practice was high in Sri Lanka (63.3%)[32]. The resemblance of Dalit and Non-Dalit of MAD might be due to the occupations of the mothers and the same locality. The complementary feeding practices are generally irregular and unsupervised[33]. The current prevalence of MAD manifested that it still needs to promote the practices of MAD.

The findings showed that half of children aged 6–23 months were stunting in Dalit (49.9%) while more than one-third in Non-Dalit (39.0%). In comparison with the findings, Ethiopia (58.1%)[34] and India(52.3%)[35] had higher prevalence of stunting but lower in Sri Lanka (17.3%)[32] and Nepal (35.6%) [10]. The difference of stunting in Dalit and Non-Dalit might be due to the education of mother and father and the knowledge of mothers on child feeding. So, the existing magnitude of stunting recommended that the government should focus on the nutrition intervention programme.

The findings from multivariable logistic regression analysis revealed that the minimum acceptable diet practices did not find significant association with sex of child, father education, birth interval, family types, main source of family income and household owning agriculture land among Dalit while family type, main source of family income, household owing agriculture land, ANC visit, place of delivery, Post Natal Care (PNC) visit, media exposure, number of child, and mother occupation in Non-Dalit. Furthermore, this study revealed that minimum acceptable diet practice was protected among children aged 6–11 months as compared to children aged 12–23 months in Dalit and Non-Dalit. This findings got supported by the findings of somewhere else[15,18,19,21]. This study showed that one-fifth in Dalit (20.0%) and more than one-fourth in Non-Dalit (29.7%) of children got only MAD practices among children aged 6–11 month. In Nepal, mother breast milk seems to be sufficient for the first year of life to feed their children whenever children show their interest and generally, mothers used to feed rice and legume to their children[33]. However, complementary feeding practices make essential in this age because breast feeding gets inadequate after six months of child[36]. So, inadequate child feedings becomes risky for growth faltering among children of Nepal[36].

The findings revealed that the minimum acceptable diet was less likely among child mothers who had no knowledge of child feeding as compared to child mothers who had knowledge on child feeding in Dalit and Non-Dalit. The result got supported from a study conducted in Nepal[23]. About one-fifth of mother practiced MAD among their children, having no knowledge of child feeding might be due to the association of knowledge on child feeding with MAD. The evidence from systematic review showed that

lack of knowledge was a key barriers of optimal complementary feeding practice[37]. In Nepal, a study showed the inadequate minimum acceptable diet practices would be due to poor knowledge on child feeding practices[19]. A study shows that lack of awareness regarding frequency of feeding as well as diversified nutrient taking behavior might be the risk of undernutrition among children. So, maternal nutrition education might help to promote complementary feeding practice among children[15].

The result showed that MAD practices was more likely among children with birth interval upto 2 years than children with birth interval above 2 years in Non-Dalit. The findings was contrast with a study conducted in South Ethiopia[38] and Nigeria[39] because of the different study's settings. A study showed more the increasing of the birth-interval more the decreasing of child undernutrition and mortality[40]. This might be due to mothers who fed her elder child and at the same time they fed younger child.

The findings showed that MAD practice was more probably among children who had no illness in past two weeks as compared to children who had illness in past two weeks in Dalit and Non-Dalit. This result got supported by the study conducted in Sri Lanka[20]. In Nepal, about three-fifth of child mother (59%) fed the same amount of food during episodes of diarrhea and about one-fourth of mother (24%) fed lesser than usual feeding[41]. But one-fourth of mother (29%) increased food during child illness as it mentions in NDHS[10]. Child feeding got reduced due to child illness that may affect health of child[20].

The study reveals that the stunting was protected among children aged 6–11 as compared to 12–23 months whereas only one-fifth of children aged 6–11 months had stunting in Non-Dalit. This result got supported by the findings of a study conducted in Ethiopia[34] and Indonesia[42]. This findings also got supported by the findings of somewhere else[43]. Stunting was less likely among children below six months as they depend on breastfeeding[44]. Some mothers feed breast milk till a year and they feed solid food whenever children show interest[33]. Poor child feeding practices become recognized contributor to undernutrition among this age[45,46].

This study manifested that the stunting were more likely among children living with the nuclear family than joint family in Dalit. The findings got supported from the study conducted in Nepal [47] and Kenya[48]. The findings gets contrast with a study conducted in Pakistan[49]. This findings showed about one-fourth of Dalit child mothers (24.1%) working as a daily wage/labor and they might be unable to care their children properly. Mothers involving in the work outside setting were taking their children with them did not feed in time, which might effect on child complementary feeding practices[33]. Children living in a joint family get appropriate care by someone (for example-grand-parents) during busy of her/his mother.

The findings stated that the stunting was more likely among child mother who did not visit ANC than child mother who visited ANC in Non-Dalit and half of children were stunting who did not visit ANC. This findings got supported by the study conducted in Indonesia[42]. Adequate ANC visit might help to enhance knowledge regarding appropriate child feeding practices and got opportunity of appropriate counseling regarding child care. This result indicated that the stunting was more likely among the mother who did not expose to media than mother who exposed to media in Non-Dalit. This findings got

supported from the study of Bangladesh[50]. The media provides information regarding overall knowledge on child health and nutrition, which might help to reduce the stunting[50].

The comparative studies showed the prevalence of minimum acceptable diet and stunting and associated factors among children aged 6–23 months. Naturally, it is not free from some limitations. The complementary feeding practices were not observed but it depended on the response of mothers which might be exaggerated by social desirability bias and recall bias.

Conclusion

The study revealed that the proportion of minimum acceptable diet practice resembles in Dalit and Non-Dalit children. This practice gets similar to the national figure, but insignificant to the countries that have better health indicators. But it did not get satisfactory level in this region because of the key associated factors; age of child, knowledge on child feeding and child illness within past 2 weeks in both groups whereas birth interval only in Non-Dalit. The prevalence of stunting was higher in Dalit than Non-Dalit. But it also got higher than National figure[10]. Stunting got higher in both groups which indicate the serious public health concern among children. In addition, type of family becomes an important associated factor of stunting among Dalit whereas age of child, ANC visit, and media exposure among Non-Dalit.

So, the findings of the study confirm that there have been quiet rooms to improve infant and child feeding and reduce stunting among children in Nepal. Improving maternal nutrition education, access and utilization of health services and promoting the exposed to media would be helped in promoting infant young child feeding practices and reducing stunting.

Abbreviations

ANC: Ante natal care; AOR: Adjusted odds ratio; BCC: Behaviour change communication; CI: Confidence interval; CMA: Community medicine assistant; COR: Crude odds ratio; HAZ: Height for age; MAD: Minimum acceptable diet; NDHS: Nepal demographic health survey; PNC: Post-natal care; SD: Standard deviation; SPSS: Statistical package for social sciences; VDC: Village development committee; WHO: World health organization.

Declarations

None of the authors have any conflict of interest to this manuscript.

Ethical approval and consent to participate

Ethical approval was obtained from the Institutional Review Committee of Institute of Medicine, Nepal [Ref No.95 (6-11-E) ²/073/074]. Permission was taken from District Public health Office, Dhanusha. This

study did not involve any invasive procedure and a type observational study. So, the study posed no risk to study participants. Accordingly, all eligible child of mother were shared about the aim and method of the study and written Informed consent was taken. Furthermore, confidentiality was maintained and they had right to withdraw at any time from the study.

Consent to Publish

Not applicable

Availability of data and materials

Data will be accessible upon request from the corresponding author.

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Authors' contribution

AKS conceived the study, developed the tool, coordinated data collection, conducted the inferential analysis and drafted the manuscript. RP, MDD, and RS supported during the proposal development (study design, methodology, ethical approval). AP supported in editing of the manuscript. All authors have read and approved the final manuscript.

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Before training, author shared in different presentation without applying this criteria. We would like to acknowledge Mr. Sujit Kumar Sah who edits the language.

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Tables

Table1: Socio-demographic and economic characteristics of children and their mothers

Characteristics	Dalits (n=299)		Non-Dalits (n=300)	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Age of child (in months)				
6-8	30	10.0	37	12.3
9-11	51	17.1	46	15.3
12-23	218	72.9	217	72.3
Mean age \pm SD	14.51 \pm 4.678		14.42 \pm 4.560	
Sex of child				
Male	129	43.1	167	55.7
Female	170	56.9	133	44.3
Mother's occupation				
Housewife	176	58.9	198	66.0
Agriculture	49	16.4	76	25.3
Labour	72	24.1	8	2.7
Others	2	0.7	18	6.0
Mother education				
Illiterate	248	83.0	133	44.3
Primary	16	5.4	33	11.0
Some secondary	25	8.4	82	27.3
SLC and above	10	3.3	52	17.3

Table 2: Nutrition, health and knowledge related characteristics of children and their mother

Characteristics	Dalits (n=299)		Non-Dalits (n=300)	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Minimum acceptable diet				
Yes	131	43.8	133	44.3
No	168	56.2	167	55.7
Stunting				
Normal	68	22.7	90	30.0
Mild	82	27.4	93	31.0
Moderate	95	31.8	81	27
Severe	54	18.1	36	12.0
Child illness in past two weeks (Diarrhea/ARI/Fever)				
Yes	58	19.4	56	18.7
No	241	80.6	244	81.3
Knowledge on child feeding				
Yes	155	51.8	180	60.0
No	144	48.2	120	40.0

Table 3: Age and sex-wise status of minimum acceptable diet and stunting among children

Characteristics	Dalits(n=299)		Non-Dalits (n=300)	
	MAD Yes-n(%)	Stunting Yes-n(%)	MAD Yes-n(%)	Stunting Yes-n(%)
Sex				
Male	50(38.8)	61(47.3)	72(43.1)	64(38.3)
Female	81(47.6)	88(51.8)	61(45.9)	53(39.8)
Age of child (months)				
6-8	6(20.0)	11(36.7)	11(29.7)	6(16.2)
9-11	16(31.4)	26(51.0)	15(32.6)	18(39.1)
12-23	109(50.0)	112(51.4)	107(49.3)	93(42.9)

MAD: Minimum acceptable diet, n=number, %=Percentage

Table 4 A multivariable logistic regression showing the factors associated with minimum acceptable diet among children aged 6-23 months in Dalits

Characteristics	Minimum acceptable diet		COR (95% of CI)	AOR (95% of CI)
	Met n(%)	Not-Met n(%)		
Age of child				
12-23 Months	109(50.0)	109(50.0)	1	1
6-11 Months	22(27.2)	59(72.8)	0.37(0.21-0.65)	0.25(0.11-0.54)*
Sex of child				
Female	81(47.6)	89(52.4)	1	1
Male	50(38.8)	79(61.2)	0.70(0.44-1.11)	0.68(0.35-1.29)
Father education				
Secondary and above	44(52.4)	40(47.6)	1	1
Upto primary	87(40.5)	128(59.5)	0.62(0.37-1.03)	0.46(0.21-1.02)
Child illness				
Yes	8(13.8)	50(86.2)	1	1
No	45(54.9)	37(45.1)	6.52(2.96-14.32)	4.31(1.56-11.88)*
Birth interval				
Above 2 years	28(39.4)	43(60.6)	1	1
Upto 2 years	70(50.0)	70(50.0)	1.54(0.86-2.74)	1.68(0.83-3.38)
Family types				
Joint	92(41.1)	132(58.9)	1	1
Nuclear	39(52.0)	36(48.0)	1.55(0.92-2.63)	0.46(0.21-1.02)
Main source of income				
Non-agriculture	109(42.2)	149(57.8)	1	1
Agriculture	22(53.7)	19(46.3)	1.58(0.82-3.07)	1.07(0.40-2.90)
Knowledge on child feeding				
Yes	92(61.3)	58(38.7)	1	1
No	39(26.2)	110(73.8)	0.22(0.14-0.37)	0.31(0.16-0.61)*
Household ownership on agriculture land				
Yes	58(35.8)	104(64.2)	1	1
No	73(53.3)	64(46.7)	0.49(0.31-0.78)	0.79(0.37-1.67)

*: significant (CI > 1 or < 1), COR: Crude odds ratio, AOR: Adjusted odds ratio, n: number, CI: Confident interval.

Table 5: A multivariable logistic regression showing the factors associated with minimum acceptable diet among children aged 6-23 months in Non-Dalits

Characteristics	Minimum acceptable diet		COR (95% of CI)	AOR (95% of CI)
	Met n(%)	Not-Met n(%)		
Age of child				
12-23 Months	107(49.3)	110(50.7)	1	1
6-11 Months	26(31.3)	57(68.7)	0.47(0.28-0.80)	0.37(0.21-0.64)*
Child illness				
Yes	10(17.9)	46(82.1)	1	1
No	123(50.4)	121(49.6)	4.68(2.26-9.69)	4.80(2.23-10.32)*
Birth interval				
Above 2 years	33(43.4)	42(56.6)	1	1
Upto 2 years	49(55.7)	39(44.3)	1.64(0.88-3.04)	1.92(1.56-3.19)*
Family types				
Joint	107(42.5)	145(57.5)	1	1
Nuclear	26(54.2)	22(45.8)	1.60(0.86-2.98)	1.72(0.98-3.01)
Main source of family income				
Non-agriculture	82(41.4)	116(58.6)	1	1
Agriculture	51(50.0)	51(50.0)	1.42(0.88-2.29)	1.19(0.65-2.19)
Knowledge on child feeding				
Yes	103(61.3)	65(38.7)	1	1
No	30(22.7)	102(77.3)	0.19-0.11-0.31)	0.26(0.16-0.42)*
Household ownership on agriculture land				
Yes	121(46.7)	138(53.3)	1	1
No	12(29.3)	29(70.7)	0.47(0.23-0.97)	0.72(0.39-1.33)
ANC visit				
Yes	110(41.7)	154(58.3)	1	1
No	23(63.9)	13(36.1)	2.45(1.20-5.10)	1.71(0.91-3.20)
Place-wise delivery				
Health facilities	57(35.0)	106(65.0)	1	1
Home	76(55.5)	61(44.5)	2.32(1.45-3.69)	0.84(0.15-4.66)
PNC visit				
Yes	58(35.4)	106(64.6)	1	1
No	75(55.1)	61(44.9)	2.25(1.41-3.58)	1.45(0.26-7.99)
Media exposure				
Yes	81(46.0)	95(54.0)	1	1
No	50(40.7)	73(59.3)	0.61(0.31-1.18)	0.62(0.34-1.12)
Number of child				
Two or more	83(50.6)	81(49.4)	1	1
Single	50(36.8)	86(63.2)	0.57(0.36-0.90)	-
Mother occupation				
Non-housewife	55(53.9)	47(46.1)	1	1
Housewife	78(39.4)	120(60.6)	0.56(0.34-0.90)	0.97(0.59-1.59)

*: significant (CI :> 1 or <1), COR: Crude odds ratio, AOR: Adjusted odds ratio, n: number, CI: Confident interval, ANC: Ante natal care.

Table 6: A multivariable logistic regression showing the factors associated with stunting among children aged 6-23 months in Dalits

Characteristics	Stunting		COR (95% of CI)	AOR (95% of CI)
	Stunted	Normal		
Family types				
Joint	102(45.5)	122(54.5)	1	1
Nuclear	47(62.7)	28(37.3)	2.01(1.17-3.43)	1.93(1.11-3.34)*
Knowledge on child feeding				
Yes	66(44.0)	84(56.0)	1	1
No	83(55.7)	66(44.3)	1.60(1.01-2.53)	1.59(0.99-2.54)
ANC visit				
Yes	112(47.7)	123(52.3)	1	1
No	37(57.8)	27(42.2)	1.51(0.86-2.63)	1.17(0.65-2.12)
Media exposure				
Yes	79(44.9)	97(55.1)	1	1
No	70(56.9)	53(43.1)	1.62(1.02-2.58)	1.56(0.94-2.58)
TICF				
Yes	64(45.4)	77(54.6)	1	1
No	85(53.8)	73(46.2)	1.41(0.89-2.21)	1.57(0.97-2.54)

*: significant (CI :> 1 or <1), COR: Crude odds ratio, AOR: Adjusted odds ratio, n: number, CI: Confident interval, TICF: Timely initiation of complementary feeding.

Table 7: A multivariable logistic regression showing the factors associated with stunting among children aged 6-23 months in Non-Dalits

Characteristics	Stunting		COR (95% of CI)	AOR (95% of CI)
	Stunted	Normal		
Age of child				
12-23 Months	93(42.9)	124(57.1)	1	1
6-11 Months	24(28.9)	59(71.1)	0.54(0.31-0.94)	0.24(0.10-0.57)*
Father education				
Secondary and above	59(33.9)	115(66.1)	1	1
Upto primary	58(46.0)	68(54.0)	1.66(1.04-2.66)	1.18(0.56-2.46)
Birth interval				
Above 2 years	34(44.7)	42(55.3)	1	1
Upto 2 years	30(34.1)	58(65.9)	0.64(0.34-1.20)	0.58(0.29-1.20)
Family types				
Joint	91(36.1)	161(63.9)	1	1
Nuclear	26(54.2)	22(45.8)	2.09(1.12-3.90)	2.27(0.97-5.31)
Household ownership on agriculture land				
Yes	96(37.1)	163(62.9)	1	1
No	21(51.2)	20(48.8)	1.78(0.92-3.46)	2.31(0.83-6.43)
ANC visit				
Yes	99(37.5)	165(62.5)	1	1
No	18(50.0)	18(50.0)	1.67(0.83-3.35)	3.20(1.15-8.90)*
Place of delivery				
Health facilities	58(35.6)	105(64.4)	1	1
Home	59(43.1)	78(56.9)	1.37(0.86-2.18)	0.98(0.47-2.04)
Media exposure				
Yes	95(37.1)	161(62.9)	1	1
No	22(50.0)	22(50.0)	1.70(0.89-3.22)	3.10(1.11-8.64)*
Mother occupation				
Non-housewife	45(44.1)	57(55.9)	1	1
Housewife	72(36.4)	126(63.6)	0.72(0.45-1.18)	0.64(0.31-1.33)

*: significant (CI :> 1 or <1), COR: Crude odds ratio, AOR: Adjusted odds ratio, n: number, CI: Confident interval.