Factors associated with nutritional status of under five children among Satar Community of Bhadrapur Municipality, Jhapa, Nepal

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ABSTRACT

Background: Adequate feeding is basic right of human being. According to NDHS 2016, prevalence of stunting, wasting and underweight are 36%, 10% and 27% respectively. The prevalence may be more in underprivileged community like Satar community who reside in eastern part of Nepal. This study was conducted to assess the factors associated with under nutrition of under five years children of Satar community in Bhadrapur Municipality.

Methods: A community based cross sectional study was conducted in Bhadrapur Municipality of Jhapa district which were purposively selected. Four wards where Satar community reside were selected for collection of data. Verbal informed consent was taken from the mothers of the under five children and approval was taken from research committee of Central Institute of Science and Technology College. Bivariate analysis was performed to detect the factors associated with nutrition status of children.

Results: In the study, prevalence of stunting, wasting and underweight were high as compared to national data i.e. 39.5%, 14.2% and 29.5% percent respectively. The study found that maternal education, paternal education, family income, exclusive breastfeeding and food frequency was significantly associated with under nutrition (stunting, wasting and underweight). Stunting was significantly associated with age of child and mother and religion. Underweight was associated with religion and weaning of children.

Conclusions: High prevalence of stunting, wasting and underweight are due to socio demographic factors like religion, educational status of father and mother, family income and child feeding practice. Programs should be focused on socio demographic and economic factors and child feeding practice to reduce problem of malnutrition.

Keywords: Satar community, Stunting, Underweight, Wasting

INTRODUCTION

Good nutrition is essential for growth and development of children.¹ Income is one of major determinant of stunting: food insecurity, diets lacking in diversity, high rates of infectious diseases and inappropriate infant feeding and care practices, and poor sanitation and hygiene practices also contribute to persistent stunting.² Nutritional status is defined as the state of the body resulting from the intake, absorption and utilization of food.³ According to the Global Nutrition Report, 2016 a third of the people worldwide are either under -nourished or overweight. The document points out that malnutrition are responsible for nearly half of all deaths of children under five worldwide.⁴ The World Health Organization estimates that childhood underweight is the cause for about 35% of all deaths of children under the age of five years worldwide.⁵ More than 83% of population resides in rural
area according to the census of Nepal. Recent data from the 2016 Nepal demographic and health survey indicated that 36% of children under 5 years of age were stunted and 12% were severely stunted, whereas prevalence is high in rural area (40%) then in urban area (30%), 10% were wasted and 2% were severely wasted and 27 were underweight were as prevalence is high in rural (31%) then in urban (23%). The aim of the study was to assess the factors affecting the nutritional status of under five years children of Satar community in Bhadrapur Municipality of Nepal.

METHODS

This was a descriptive cross-sectional study carried out to estimate stunting, wasting and underweight and their associated factors among children of age under 5 years of Satar community in Bhadrapur Municipality of Jhapa district which is located in province number 1, is one of the 77 districts in Nepal. Satar is one of the backward and disadvantaged community in Nepal. The study was conducted from November 2018 to March 2019. Ethical approval was taken from research committee of Central Institute of Science and Technology. Verbal Informed consent was taken from the respondent before starting data collection process.

The sample size is calculated by using prevalence of stunting. Following formula is used to estimate the required sample size.

\[
\text{Sample size (n)} = \frac{z^2 \times p \times (1-p)}{d^2}
\]

Where,

- \(z\) = critical value which is equal to 1.96 in two-tailed test.
- \(p\) = prevalence of stunting will be taken as a reference 36% (NDHS 2016).
- \(d\) = absolute sampling error that can be tolerated and it is fixed at 7%.

The total sample size for the study is 181. Non-response rate was taken as 5% of the sample size which gives the final sample size of 190. Municipality was selected purposively. Four wards with highest population of Satar community were selected. Fifty children each from four wards were selected randomly. The randomly selected children of age under five years from Satar community and their mothers were included in the study. The children who were ill for more than 7 days, and had physical deformities were excluded from the study.

Structured questionnaires, weighing machine and measuring tapes were used as the tools for data collection. The weight of the participants was measured in kilogram and height was measured in the unit cm with nearest 0.1 cm. The mothers of the children were interviewed and the children were measured using weighing machine and measuring tape for determining undernutrition. The data generated were compared with WHO standards for determining stunting, wasting and underweight. The data was recorded in Microsoft Excel sheet, and was analyzed using Statistical Package for Social Sciences version 23. A descriptive analysis was done using mean, frequency, percentage and standard deviation. Chi square Test for categorical variables to test the level of significance. Significance level was observed at p value less than 0.05.

RESULTS

Table 1 shows the descriptive analysis related to different variables of children of under five years of Satar community in Bhadrapur Municipality of Nepal.

| Characteristics                              | Frequency | Percentage |
|----------------------------------------------|-----------|------------|
| **Sex of child**                             |           |            |
| Male                                         | 90        | 47.4       |
| Female                                       | 100       | 52.6       |
| **Age of child**                             |           |            |
| >24 months                                   | 69        | 36.3       |
| ≥24 months                                   | 121       | 63.7       |
| **Age of mother**                            |           |            |
| <20 years                                    | 31        | 16.3       |
| ≥20 years                                    | 159       | 83.7       |
| **Family type**                              |           |            |
| Nuclear                                      | 76        | 40         |
| Joint                                        | 144       | 60         |
| **Education status of mother**               |           |            |
| No education                                 | 37        | 19.5       |
| Primary level                                | 153       | 80.5       |
| **Education status of father**               |           |            |
| No education                                 | 18        | 9.5        |
| Primary level                                | 126       | 66.3       |
| Secondary level                              | 46        | 24.2       |
| **Monthly income**                           |           |            |
| Nrs.<13500                                    | 40        | 21.1       |
| Nrs.≥13500                                    | 150       | 78.9       |
| **Religion of respondent**                   |           |            |
| Hindu                                        | 164       | 86.3       |
| Christian                                    | 26        | 13.7       |
| **Main source of income**                    |           |            |
| Agriculture                                   | 52        | 27.4       |
| Business                                     | 41        | 21.6       |
| Remittance                                   | 43        | 22.7       |
| Labour/daily wages                           | 54        | 28.4       |
| **Exclusive breastfeeding**                  |           |            |
| <6 months                                    | 56        | 29.5       |
| ≥6 months                                    | 134       | 70.5       |
| **Weaning of child**                         |           |            |
| Before 6 months                              | 40        | 21.1       |
| More or equal to 6 months                    | 150       | 78.9       |
| **Food frequency in a day**                  |           |            |
| <4 times                                     | 69        | 36.3       |
| ≥ 4 times                                    | 121       | 63.7       |
Among the total participants, more than half (52.6%) were female and almost two-third (63.7%) were of age more than 24 months. The age of more than four-fifth (83.7%) of the mothers was more than or equal to 20 years and sixty percent of the participants had joint family.

Regarding education status, almost one-fifth (19.5%) of mothers and almost one-tenth (9.5%) of the fathers were illiterate. More than four-fifth (86.3%) of the participants followed Hindu religion and labor/daily wages was the main source of income (28.4%) followed by agriculture (27.4%). Almost four-fifth (83.7%) of the mothers was more than or equal to 20 years and sixty percent of the participants had joint family.

Table 2: Association between stunting and other variables.

| Characteristics                  | Stunting | P value |
|----------------------------------|----------|---------|
| Sex                              |          |         |
| Male                             | 30       | 60      | 0.100  |
| Female                           | 45       | 55      |        |
| Age of child (months)            |          |         |
| <24                              | 18       | 51      | 0.004* |
| ≥24                              | 57       | 64      |        |
| Age of mother (years)            |          |         |
| <20                              | 20       | 11      | 0.002* |
| ≥20                              | 55       | 104     |        |
| Family type                      |          |         |
| Nuclear                          | 27       | 49      | 0.363  |
| Joint                            | 48       | 66      |        |
| Education status of mother       |          |         |
| No education                     | 28       | 9       | <0.001*|
| Primary                          | 47       | 106     |        |
| Education status of father       |          |         |
| No education                     | 11       | 7       | 0.002* |
| Primary                          | 55       | 71      |        |
| Secondary                        | 9        | 37      |        |
| Religion of respondent           |          |         |
| Hindu                            | 60       | 104     | 0.041  |
| Christianity                     | 15       | 11      |        |
| Monthly income                   |          |         |
| <13500                           | 29       | 11      | <0.001*|
| ≥13500                           | 46       | 104     |        |
| Main source of income            |          |         |
| Agriculture                      | 13       | 39      | <0.001*|
| Business                         | 9        | 35      |        |
| Remittance                       | 15       | 25      |        |
| Labour or daily wages            | 38       | 16      |        |
| Exclusive breastfeeding (months) |          |         |
| <6                               | 30       | 26      | 0.010  |
| ≥6                               | 45       | 89      |        |
| Weaning of child (months)        |          |         |
| Before 6                         | 19       | 21      | 0.242  |
| ≥6                               | 56       | 94      |        |
| Food frequency in a day          |          |         |
| <3 times                         | 37       | 32      |        |
| ≥4 times                         | 38       | 83      | 0.003* |

*p<0.05

Figure 1 shows the nutritional status of the under five years children. Among the children, 39.5% were stunted, 29.5% were underweight and 14.2% were wasted (Figure 1).

Table 3 shows the association between underweight and different variables under study.

Among the variables, family type (p=0.038), education of mother (p<0.001), education of father (p<0.001), religion of the participants (p=0.013), source of income and monthly income (p<0.001), weaning of the children (p=0.042), exclusively breast feeding (p=0.001) and food frequency (p=0.004) were significantly associated with wasting of under five years children (Table 3).

Table 4 shows the association between wasting and different socio-demographic, socio-economic and nutritional variables of the participants.
Of the variables, education of father and mother (p<0.001), religion of the participants (p=0.046), main source of income (p=0.001), family income (p<0.001), exclusive breast feeding (p=0.022) and food frequency (p=0.007) were significantly associated with wasting of the under five years children (Table 4).

**Table 3: Association between underweight and other variables.**

| Characteristics          | Underweight | P value |
|--------------------------|-------------|---------|
|                          | Yes | No |
| Sex                      |     |     |
| Male                     | 27  | 63  | 0.880 |
| Female                   | 29  | 71  |       |
| Age of child (months)    |     |     |
| <24                      | 15  | 54  | 0.077 |
| ≥24                      | 41  | 80  |       |
| Age of mother (years)    |     |     |
| <20                      | 11  | 20  | 0.422 |
| ≥20                      | 45  | 114 |       |
| Family type              |     |     |
| Nuclear                  | 16  | 60  | 0.038*|
| Joint                    | 40  | 74  |       |
| Education status of mother |   |     |
| No education             | 27  | 10  | <0.001*|
| Primary                  | 29  | 124 |       |
| Education status of father |   |     |
| No education             | 12  | 6   | 0.001*|
| Primary                  | 33  | 93  |       |
| Secondary                | 11  | 35  |       |
| Religion of respondent   |     |     |
| Hindu                    | 43  | 121 | 0.013*|
| Christianity             | 13  | 13  |       |
| Main source of income    |     |     |
| Agriculture              | 7   | 45  | <0.001*|
| Business                 | 8   | 36  |       |
| Remittance               | 11  | 29  |       |
| Labour or daily wages    | 30  | 24  |       |
| Monthly income           |     |     |
| <13500                   | 24  | 16  | <0.001*|
| ≥13500                   | 32  | 118 |       |
| Exclusive breastfeeding   |     |     |
| <6 months                | 28  | 28  | <0.001*|
| ≥6 months                | 28  | 106 |       |
| Weaning of child (months)|     |     |
| Before 6                 | 17  | 23  | 0.042*|
| ≥6                       | 39  | 111 |       |
| Food frequency in a day   |     |     |
| <4 times                 | 29  | 40  | 0.004*|
| ≥4 times                 | 27  | 94  |       |
| *p<0.05                  |     |     |

**Table 4: Association between wasting and other variables.**

| Characteristics          | Wasting | P value |
|--------------------------|---------|---------|
|                          | Yes | No |
| Sex                      |     |     |
| Male                     | 17  | 73  | 0.080 |
| Female                   | 10  | 90  |       |
| Age of child (months)    |     |     |
| <24                      | 8   | 61  | 0.435 |
| ≥24                      | 19  | 102 |       |
| Age of mother (years)    |     |     |
| <20                      | 6   | 25  | 0.370 |
| ≥20                      | 21  | 138 |       |
| Family type              |     |     |
| Nuclear                  | 10  | 66  | 0.734 |
| Joint                    | 17  | 97  |       |
| Education status of mother |   |     |
| No education             | 16  | 21  | <0.001*|
| Primary                  | 11  | 142 |       |
| Education status of father |   |     |
| No education             | 8   | 10  | <0.001*|
| Primary                  | 16  | 110 |       |
| Secondary                |     |     |
| Religion of respondent   |     |     |
| Hindu                    | 20  | 144 | 0.046*|
| Christianity             | 7   | 19  |       |
| Main source of income    |     |     |
| Agriculture              | 3   | 49  | <0.001*|
| Business                 | 2   | 42  |       |
| Remittance               | 6   | 34  |       |
| Labour or daily wages    | 16  | 38  |       |
| Exclusive breastfeeding (months) |   |     |
| <6                       | 13  | 43  | 0.022*|
| ≥6                       | 14  | 120 |       |
| Weaning of child (months) |     |     |
| Before 6                 | 7   | 33  | 0.502 |
| ≥6                       | 20  | 130 |       |
| Food frequency in a day   |     |     |
| <3 times                 | 16  | 53  | 0.007*|
| ≥4 times                 | 11  | 110 |       |
| Monthly income           |     |     |
| <13500                   | 13  | 27  | <0.001*|
| ≥13500                   | 14  | 136 |       |

**DISCUSSION**

The prevalence of stunting, wasting and underweight was found to be 39.5 percent, 14.2 percent, and 29.5 percent respectively among children of Satar community in Bhadrapur Municipality of Jhapa district.
Stunting, wasting and underweight were higher than the national data of Nepal demographic and health survey. The prevalence of stunting, wasting and underweight in province number 1 of Nepal where Bhadrapur Municipality lies is 33%, 12% and 24.4% which is lower than the undernutrition in children of Satar community of this study.

Sex of children were not significantly related to stunting, wasting and underweight of under five years children and the results were supported by a study conducted in east Gojjam zone, Northwest Ethiopia.

Age of children under five years was significantly associated with stunting and wasting and the study is supported by a analysis of demographic and health survey of Zambia in 2014. The study also was supported by a study conducted in North Maluku province of Indonesia. Underweight were not significantly associated with age of the children in this study and the result is not supported by national service analysis of the data of different southeast Asian countries in which wasting was associated with age of the children. The different results may be due to the smaller sample size in this study. Underweight is also not significantly associated with age of the children in this study and the results are supported by a study carried out in Wonsho Woreda, Sidama Zone Southern Ethiopia.

Maternal age was significantly associated with stunting in this study with \( p = 0.002 \) and the result is supported by a study conducted to find out the risk factors of stunting in Gianyar District, Bali. Wasting was not significantly associated with maternal age in this study and is supported by evidence from demographic and health survey of Pakistan. Underweight was also not significantly associated with maternal age in this study.

Children were more likely to be stunted, wasted and underweight if the mothers were uneducated (\( p < 0.01 \)) and the result is supported by different studies conducted around the world. Paternal education was also significant with undernutrition of under five years children and is supported by different studies.

Religion of the participants was significantly related with stunting, wasting and underweight of children in the study. Association between wasting and underweight with religion is supported by a analysis of Demographic and health survey in Nepal. Regarding income of the family of the children in the community, all stunting, wasting and underweight were significantly associated with \( p < 0.001 \). The finding is supported by different studies conducted in low-middle income countries.

The children who were weaned after six months were less likely to be underweight than the children who were weaned before six months and was statistically significant (\( p = 0.042 \)), the finding is supported by a study conducted in Indonesia. These studies also have shown that stunting and wasting are related to weaning period but in our study, it is not statistically significant. This may be due to different population and sample size.

All the forms of malnutrition were statistically significant with exclusive breastfeeding in the study as the results are supported by the study conducted in Sri Lanka and India. All the forms of malnutrition (stunting, wasting and underweight) were significantly associated with food frequency of children and the study is supported by a study conducted in Nepal.

CONCLUSION

There was higher prevalence of stunting, wasting and underweight in the children of Satar community in Bhadrapur district of Nepal than the national and provincial figure. The study revealed that maternal education, paternal education, family income, exclusive breastfeeding and food frequency was significantly associated with under nutrition (stunting, wasting and underweight). Stunting was associated with age of child and mother and religion. Underweight was associated with religion and weaning of children. The municipality as well as province should focus on different nutrition related activities to upgrade the status of indigenous community like Satar.

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