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Original Research Article

Assessment of Nutritional Status by 24-Hour Dietary Recall in Under-Five Tribal and Non-Tribal Children with Acute Malnutrition

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Abstract: ***Background:*** Assessing the nutritional status of young children, especially those under age five, is vital for tackling acute malnutrition and enhancing health outcomes. The 24-hour dietary recall gives a detailed view of what a child eats, aiding in identifying nutritional gaps and dietary habits. ***Aim of the study:*** This study aimed to assess and compare the nutritional status of under-five tribal and non-tribal children with acute malnutrition using the 24-hour dietary recall method. ***Methods:*** This comparative observational study was conducted at the Department of Pediatrics Community Based Medical College Bangladesh from September 2023 to September 2024. The study enrolled 40 children under five years, divided into 10 tribal (Group A) and 30 non-tribal (Group B) participants, selected purposively. The 24-hour dietary recall method assessed their nutritional status. Data analysis was performed using SPSS version 26.0 programs. ***Results:*** For stunting, mild stunting occurred in 40% of Group A and 33% of Group B, moderate in 20% and 47%, and severe in 40% and 20%, respectively (p=0.333). For wasting, mild wasting affected 60% of Group A and 70% of Group B, with moderate wasting at 40% and 30%, and no severe cases in either group (p=0.173). For underweight, mild underweight was 80% in both groups, moderate was 10% in Group A and 17% in Group B, and severe was 10% and 3%, respectively (p=0.104). Differences were not statistically significant. Group B consumed more dairy, legumes, eggs, meat, fish, and fruits, and had higher energy (65%) and protein intake. ***Conclusion:*** There is no significant difference in stunting, wasting, or underweight status between tribal and non-tribal under-five children. However, non-tribal children consume more dairy products, legumes, eggs, meat, fish, and various fruits, leading to higher energy and protein intake compared to tribal children.

Keywords: 24-hour dietary recall, Acute malnutrition, Energy intake, Nutritional status, Protein, Tribal children.

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INTRODUCTION

Malnutrition poses a significant public health challenge, negatively impacting children's learning abilities and potentially lowering their academic performance [1]. The school-age years are crucial for children and are characterized by significant physical, mental, emotional, and social changes [2]. This phase includes the onset of puberty, rapid growth, and alterations in the brain affecting emotions, behavior regulation, and decision-making [3]. Nutritional deficiencies during this time can increase susceptibility to infections and negatively affect mental development [4]. A balanced diet is essential for sustaining endurance, advancing physical and cognitive development, and boosting overall efficiency [5]. Malnutrition refers to a deficiency, excess, or imbalance of energy and essential nutrients, resulting in alterations to body composition, function, and health. It includes all forms of poor nutrition, such as severe hunger, undernutrition, and obesity [6]. More than 200 million schoolchildren globally are impacted by malnutrition, with undernutrition being the most prevalent [7]. UNICEF and WHO recommend that schoolchildren consume foods from at least five out of the eight food groups [8]. Malnutrition poses a significant global health challenge, impacting both infants and young adolescents [9]. Research on school-aged children in low- and middle-income countries (LMICs) such as Nigeria and Mexico highlights concerns related to both under-nutrition and over-nutrition, including food insecurity and issues with dietary diversity and patterns [10]. In line with the Digital Bangladesh Vision, the government is working to digitize human resources and development processes, making it crucial to develop a targeted plan for addressing child malnutrition. Bangladesh has set targets following the Sustainable Development Goals (SDGs) to enhance nutrition and health by 2030 [11]. However, the scarcity of research specifically addressing primary schoolchildren (ages 5–9 years) and early adolescents (ages 10–14 years) in tribal communities in Bangladesh limits our understanding of malnutrition prevalence in these age groups and obstructs the creation of effective intervention strategies [12]. This study sought to evaluate the nutritional status of under-five tribal and non-tribal children with acute malnutrition using a 24-hour dietary recall method.

METHODOLOGY

This was a comparative observational study conducted at the Department of Pediatrics Community Based Medical College Bangladesh from September 2023 to September 2024. The study enrolled 40 children under five years, divided into two groups: Group A included 10 tribal children, and Group B included 30 non-tribal children. A purposive sampling technique was used for sample selection. Proper written consent was obtained from all participants. According to the inclusion criteria of this study, children aged 6–59 months, with acute malnutrition, were included. However, based on the exclusion criteria, children aged out of the age range of 6–59 months without acute malnutrition and with known chronic illnesses such as TB, HIV, renal disease, cardiac diseases, and congenital abnormalities were excluded. The 24-hour dietary recall method assessed their nutritional status. Data were analyzed using SPSS version 26.0.

RESULT

In the socio-demographic analysis of the participants, Group A had a higher percentage of male children at 60% compared to 47% in Group B. In contrast, the latter had a slightly larger proportion of female children. Children aged 6-23 months were more prevalent in Group A (70%) than in Group B (40%). Education levels among mothers showed Group B with a significantly higher proportion of educated mothers (90%) compared to Group A (60%). Similarly, fathers were predominantly educated across both groups, with Group B at 97%. Employment among mothers was more prominent in Group B, where 47% were employed, contrasting with 20% in Group A. Fathers' employment was also higher in Group B at 70%, compared to 60% in Group A. Notably, Group B families predominantly had three or fewer children under the age of five (93%) versus Group A (10%). Lastly, age at delivery showed a higher percentage of mothers aged 20 or older in Group B (77%) compared to Group A (60%). For stunting, mild stunting was observed in 40% of Group A and 33% of Group B, while moderate stunting affected 20% and 47%, respectively. Severe stunting was found in 40% of Group A and 20% of Group B ($p = 0.333$). In terms of wasting, 60% of Group A and 70% of Group B had mild wasting, with moderate wasting reported in 40% and 30%, respectively, and no cases of severe wasting in either group ($p = 0.173$). Regarding underweight status, mild underweight was equally prevalent in both groups (80%), while moderate underweight affected 10% of Group A and 17% of Group B. Severe underweight was seen in 10% of Group A and 3% of Group B ($p = 0.104$). The differences in these nutritional statuses between the groups were not statistically significant. As per the 24-hour dietary recall evaluation, we observed that Group B (Non-tribal) consumed dairy products, legumes, eggs, meat & fish, and several fruits in higher volumes than Group B (Tribal). The present study observed that energy intake was higher among the non-tribal group at 65%, compared to 50% in the tribal group. Similarly, protein intake was also

greater in the non-tribal group, with 31.3% compared to 20% in the tribal group.

Table 1: Socio-demographic status

Variables	Group-A (n=10)		Group-B (n=30)	
	n	%	n	%
Gender of children				
Male	6	60%	14	47%
Female	4	40%	16	53%
Age of children in months				
6–23	7	70%	12	40%
24–59	3	30%	18	60%
Mothers' education				
No education	4	40%	3	10%
Educated	6	60%	27	90%
Father's education				
No education	2	20%	1	3%
Educated	8	80%	29	97%
Mother's occupation				
Employed	2	20%	14	47%
Unemployed	8	80%	16	53%
Father's occupation				
Employed	6	60%	21	70%
Unemployed	4	40%	9	30%
Number of children aged <5				
≤ 3	1	10%	28	93%
≥ 3	9	90%	2	7%
Family size				
≤ 5	6	60%	16	53%
> 5	4	40%	14	47%
Birth order of indexed child				
1-3	9	90%	28	93%
≥ 4	1	10%	2	7%
Mother's age at delivery in the year				
<20	4	40%	7	23%
≥20	6	60%	23	77%

Table 2: Distribution of stunting, wasting, and underweight status as per Z-scores

Status	Group-A (n=10)		Group-B (n=30)		p-value
Stunting status					
Mild	4	40%	10	33%	0.333
Moderate	2	20%	14	47%	
Severe	4	40%	6	20%	
Wasting status					
Mild	6	60%	21	70%	0.173
Moderate	4	40%	9	30%	
Severe	0	0%	0	0%	
Underweight status					
Mild	8	80%	24	80%	0.104
Moderate	1	10%	5	17%	
Severely	1	10%	1	3%	

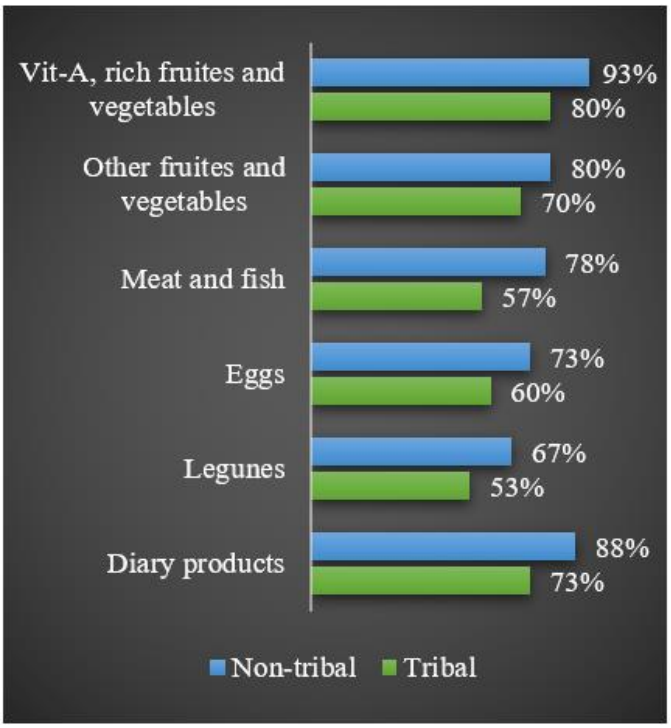

Figure 1: Foods consumed by participants as per 24-hour dietary recall against the daily requirement

Table 3: Energy and protein intake status

Variables	Tribal (n=10)	Non-tribal (n=30)
Energy intake	50%	65%
Protein intake	20%	31%

DISCUSSION

In the socio-demographic analysis, Group A had a higher percentage of male children, while Group B had a slightly higher proportion of female children. Children aged 6-23 months were more prevalent in Group A (70%) than in Group B. These findings are consistent with another study [13]. Employment among mothers was more common in Group B, and fathers' employment was higher in Group B compared to Group A. Notably, families in Group B typically had three or fewer children under the age of five, unlike Group A. Additionally, a higher percentage of mothers in Group B were aged 20 or older at delivery, reflecting trends seen in another study [14]. The study used Z-scores [13] to analyze nutritional status differences between Groups A and B. In this study, for stunting, mild stunting was noted in 40% of Group A and 33% of Group B, whereas moderate stunting was observed in 20% and 47%, respectively. Severe stunting occurred in 40% of Group A and 20% of Group B ($p = 0.333$). For wasting, mild cases were seen in 60% of Group A and 70% of Group B, with moderate cases at 40% and 30%, and no severe cases in either group ($p = 0.173$). For underweight status, mild underweight was 80% in both groups, moderate underweight affected 10% of Group A and 17% of Group B, and severe underweight was 10% and 3%, respectively ($p = 0.104$). Differences were not statistically significant. Previous studies [15,16] indicate that malnourished children are more prone to illness, and frequently sick children are more likely to be underweight. In this study, based on the 24-hour dietary recall evaluation, it appeared that Group B (non-tribal) children consumed greater amounts of dairy products, legumes, eggs, meat, fish, and various fruits compared to Group A (tribal) children. These findings were comparable with the findings of another study [16]. In this study, it was found that the non-tribal group had a higher energy intake, reaching 65%, as opposed to 50% in the tribal group. Likewise, protein intake was more substantial in the non-tribal group, at 31%, compared to 20% in the tribal group. Nearly similar findings were observed in another study [17].

Limitation of the study

This study was conducted at a single center with a small sample size and over a brief time frame. As a result, the findings may not accurately represent the broader national context.

CONCLUSION & RECOMMENDATION

The study indicates no significant differences in stunting, wasting, or underweight prevalence

between tribal and non-tribal children under five. However, non-tribal children exhibit better dietary diversity, consuming more dairy products, legumes, eggs, meat, fish, and fruits, leading to higher energy and protein intake. To improve the nutritional status of tribal children, it is recommended to enhance access to diverse foods and implement educational programs on balanced diets to encourage healthier eating habits across communities.

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