Malnutrition among Tribal Preschool Children of Paschimanchal, West Bengal, India: A review

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Background : *In India, one million children die before they reach aged 5 years, most of them from treatable or preventable diseases and nutrition-related factors contribute to half of child deaths.* ***Objectives :*** *This review work was conducted to evaluate the overall prevalence of wasting, underweight, and stunting among tribal preschool children of Paschimanchal area in West Bengal, India.* ***Methods :*** *This review work searched published data from 2008 to 2020 by using search engines like Google, Google Scholar and PubMed, following keyword as 'underweight, stunting, wasting, nutritional status and tribe, respectively. A total of 16 studies have been identified where WHO and NCHS standard were used to assess malnutrition among tribal preschool children. Out of, 9 studies were found eligible and included in the present analysis.* ***Results :*** *A total of 1683 sample from 9 studies were included in the present analysis. The overall prevalence of wasting, underweight, and stunting among tribal preschool children was found to be 19.8% (95% CI: 17.9 to 21.8), 45.9% (95% CI: 43.5 - 48.3), and 44.2% (95% CI: 41.8 - 46.6), respectively.* ***Conclusion :*** *As per WHO, rate of malnutrition of tribal preschool children is found very high in Paschimanchal area. To improve their nutritional status the community health workers may identify severe acute malnutrition (SAM) and Moderate acute malnutrition (MAM) based on MUAC< 11.5cm and <12.5 cm and refer to the Nutrition Rehabilitation Centre (NRC) for better management.*

Keywords:
Malnutrition
Stunting
Wasting
Tribe
Preschool
MUAC

INTRODUCTION

Malnutrition, particularly undernutrition is a major public health burden in India and therefore, the entire developing world [1]. In 2018, about 5.3 million children die worldwide before they reach age 5 years and the majority of those diseases are preventable or treatable, malnutrition attribute to about half of child deaths [2]. A report of UNICEF-WHO in 2011, estimated 165 million children under five years aged who were stunted, 101 million were underweight and 52 million were wasted, globally [3]. India has reported being very high occurrence of childhood malnutrition in the form of underweight, stunting and wasting, within the world. India contribute 61million (37%) of the 165 million stunted children under five years globally [3]. Recent Global Nutrition Report (2020) indicates prevalence of under-five stunting and wasting in India are 37.9% and 20.8%, which is higher than the developing nation's average of 25% and 8.9% [4]. An earlier nationwide Rapid Survey on Children (RSOC 2013-14) reported, the prevalence of wasting, underweight, and stunting of under-5 children in India was 15.1%, 29.4%, and 38.7%, respectively [5]. A recent National Family Health Survey [6] found, the prevalence of wasting, underweight, and stunting of under-5 children in India was 21.0%, 35.7%, and 38.4%, respectively. A recent systematic review reported the prevalence of stunting, underweight, and wasting was 25%. 43.3%, and 43.0%, among tribal children in India [7]. Due to COVID-19 pandemic, it is expected that the rate of child malnutrition increasing globally. A recent Standing Together for Nutrition consortium estimated that an additional 6.7 million children to be suffered from wasting in 2020 than with projections without COVID-19 and majority (57.6%) of them South Asian[8]. Corona virus (SARS-CoV-2) is an infectious disease characterized by inflammatory disorder, which reduced food intake and expanded muscle catabolism.

Consequently, patients are at higher chance of being malnourished [9]. Numerous investigations reported that there is an effect of nutrition on COVID-19 disease [10-14].

Undernutrition in preschool children impaired their growth and development which can contribute high rates of child mortality & morbidity and it also detrimental to the longer term of these who survive [15]. Therefore, improvement of nutrition and health status of children is paramount importance at the national level. Many studies are conducted to assess health and nutritional status among tribal preschool children in these areas [16-27]. However, there's no published literature on large scale survey on nutritional status among tribal preschool children in this area.

India is home to 705 Scheduled Tribes (ST) and sub-tribe including 75 particularly vulnerable tribal groups (PVTG) scattered almost all areas of the country. Tribal populations constitute about 8.6% of total population in India and 5.8% of total population of West Bengal [28].About 34% tribal populations inhabited in three districts namely Bankura, Purulia and Paschim Midnapur (undivided). Tribal effective literacy rate of three districts are 59.4%, 53.9% and 59.6%, respectively[28]. The most populated tribes in these areas were Santal, Oraon, Munda, Bhunij, Kora, Lodha, Mahali, Savar, Birhor, etc. Among them Lodha and Birhor are Particularly Vulnerable Tribal Groups. The tribal population of India are recognized as vulnerable socially, economically and others. Their life styles and food habits are different from that of their rural neighbors [29]. Living strategy of tribal population is different and fully dependent on cultivation, forest product, hunting and recently few of them are engaged in government service as well as small scale business. In general they're considered to be marginalized population of India.

Often, wasting, stunting, and underweight were used to evaluate the nutritional status of the children, since these measures reflect both previous and present nutritional status during early childhood. In view of the above, present review was conducted to compute overall prevalence and severity of wasting, stunting, and underweight among tribal preschool children of Paschimanchal area of West Bengal, India.

METHODS

The methodology may be a very essential aspect of the any review work. Keeping this thing in mind, a systematic method of reviewing the published literature available has been collected and screened following standard protocol (**figure 1**). The aim of the current literature review was to draw conclusion based on the available published literature on nutritional status among tribal preschool children of Paschimanchal districts of West Bengal **(figure 2)**. Data on published literature explore between 2001 to 2020 associated with nutritional status of tribal preschool children of mention area by using electronic search engines as Google, Google Scholar and Pubmed, Academia, Research Gate, MedInd, medknow etc. The subsequent standard MeSH used to literature search as tribal, preschool children, undernutrition, underweight, stunted and wasted, Paschimanchal, etc. Selection criteria for this review was published original research paper in english language that reported rate of wasting stunting, and underweight separately by age and place (district), respectively.

Figure 1. Screening & selection of published studies

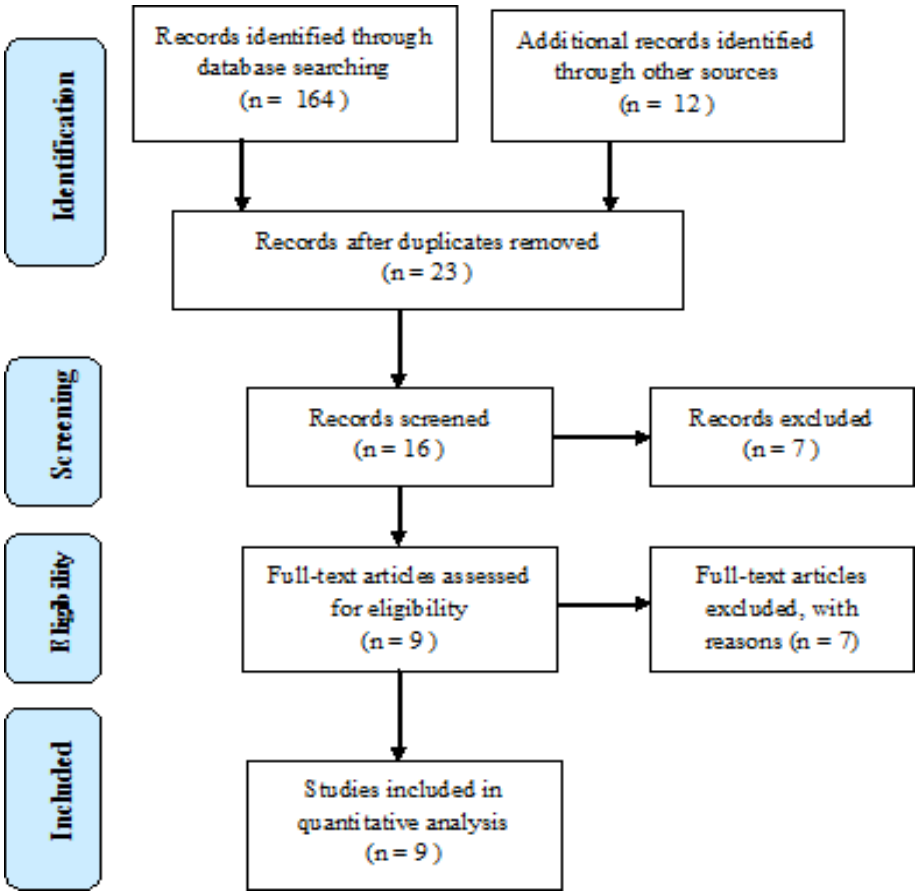

Figure 2. Paschimanchal area of West Bengal, India

Cross-reference was also used to trace the relevant studies. A total of 16 studies have been found to assess health and nutritional status of tribal children in Paschimanchal area. After full text screening, 9 studies were found eligible that reported malnutrition in the form of wasting, underweight, and stunting among the preschool children.

To evaluate the overall nutritional stress and severity of malnutrition in this area, we followed the WHO [30] criteria for prevalence of malnutrition as underweight, stunting and wasting by percentage prevalence of these three indicators among children. The WHO classification of malnutrition cut offs are presented in **table 1**.

Table 1. Classification to assess severity of malnutrition by percentage prevalence ranges (24)

Classification	Very high (%)	High (%)	Medium (%)	Low (%
Wasting (low weight for height)	≥15	10-14	5-9	<5
Underweight (low weight for Age)	≥30	20-29	10-19	<10
Stunting (low height for Age)	≥40	30-39	20-29	<20

RESULTS AND DISCUSSION

A total of 9 studies were found an eligible from Paschimanchal area namely Bankura, Birbhum, Jhargram, Paschim Medinipur and Purulia districts of West Bengal. The available evidence on nutritional status among tribal preschool children in this area was published mainly during 2008 – 2020. The total sample size was 1683, it varies from 47 to 311 and in most studies child aged was less than 6 years.

Table 2 present details of 9 studies included in this review. Overall prevalence of underweight of preschool children of Paschimanchal area in West Bengal was found to be 45.9% (95% CI: 43.5 - 48.3). The highest and lowest rate of underweight was 65.2% and 23.5% among Santal preschool children[20,22]. This review found overall prevalence of stunting among preschool children in this area was 44.2% (95% CI: 41.8 - 46.6), it varies from 26.3% to 54.2% among Santal preschool children[20,22]. The pool data showed overall prevalence of global acute malnutrition (wasting) was found to be 19.8% (95% CI: 17.9 to 21.8). The lowest rate was reported among Santal children from Purulia district [21] and highest rate of wasting was documented among Munda and Oraon children from Paschim Medinipur district [24].

Table 2: Prevalence of malnutrition among tribal preschool children of Paschimanchal in West Bengal.

Study by	Studied District	Ethnic group	Year of data collection	Age (year)	Child Growth Standard	Sample	Underweight (%)	Stunting (%)	Wasting (%)	Reference
Bisai et al 2008	Paschim Medinipur	Lodha	2008	1-5	NCHS	74	47.3	35.1	20.3	16
Bisai et al 2011	Paschim Medinipur	Kora-Mudi	2008-09	2-5	NCHS	47	61.7	51.1	27.7	17
Bisai et al 2012	Paschim Medinipur	Munda Oraon	2009	1-5	WHO	65	61.5	38.5	55.4	18
Bisai et al 2014	Paschim Medinipur	Lodha	2012	1-5	WHO	141	40.4	29.8	34.0	19
Bisai 2014	Paschim Medinipur	Santal	2012	0-5	NCHS	299	65.2	54.2	20.1	20
Das & Bose 2011	Purulia	Santal	2009-10	2-6	NCHS	251	38.2	26.3	12.3	21

Study by	Studied District	Ethnic group	Year of data collection	Age (year)	Child Growth Standard	Sample	Underweight (%)	Stunting (%)	Wasting (%)	Reference
Mahapatra et al 2019	Paschim Medinipur & Jhargram	Santal	2018	1-5	WHO	311	23.5	47.9	13.2	22
Mukhopadhyay & Biswas 2011	Bankura	Tribes	2009	<5	WHO	188	53.1	50.0	20.2	23
Stiller et al 2020	Birbhum	Santal	2014-15	<5	WHO	307	49.2	51.9	19.0	24

An earlier District Level Household Survey-4 (2012-2013) reported the prevalence of wasting underweight, and stunting of tribal preschool children in West Bengal was 34.9%, 51.1%, and 37.4%, respectively [31]. Another Rapid Survey on Children (2013-14) reported, the prevalence of wasting, underweight, and stunting of tribal preschool children in West Bengal was 18.9%, 39.7%, and 40.5%, respectively [5]. A recent National Family Health Survey-4 (2015-16) found, the prevalence of wasting, underweight, and stunting of tribal preschool children in West Bengal was 27.8%, 42.0%, and 37.3%, respectively [32]. Pool data of Paschimanchal area revealed that the prevalence of underweight and stunting of tribal preschool children was higher than state average [5,32], whereas prevalence of wasting was found to be much lower than state average as reported by NFHS-4 [32]. Wasting is major nutritional disorder among the tribal preschool children in India including west Bengal.

CONCLUSION AND RECOMMENDATION

Conclusion

In conclusion, according to WHO [30] classification of severity of malnutrition, the overall prevalence of wasting, underweight, and stunting is under very high category, indicating critical situation in this area. In order to bring the nutritional status of preschool children within the region to extent or better than the present national and state level; for them, various developmental schemes may be implemented. In addition, there is felt need an extensive nutrition education programme of local language considering their culture and food behavior.

Recommendation

The WHO recommends to detect malnutrition in the form wasting, mid upper arm circumference (MUAC) may be used. Identify and management criteria of child wasting as severe acute malnutrition (SAM) as MUAC <11.5cm and Moderate acute malnutrition (MAM) as MUAC<12.5cm and/or oedema. Since, measurement of MUAC considered as low cost technology, needs only a single tailoring tape. Thus, community health workers (CHWs) may identify and refer SAM or MAM children to the Nutrition Rehabilitation Centre (NRC) for better management.

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