



Malnutrition and psychosocial dysfunction among the orphan and vulnerable children in Kaski district, Nepal

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ABSTRACT

Introduction: Malnutrition and mental disorders are the emerging problems among the children and adolescents worldwide especially among the children and adolescents in developing countries like Nepal.

Objectives: To assess malnutrition and psychosocial dysfunction among vulnerable and children as well as to determine the association between malnutrition and psychosocial dysfunction among orphan and vulnerable children in Kaski district, Nepal.

Materials and Methods: The study carried out was cross sectional which was done among 302 children residing from 10 institutional care facilities in Kaski district, Nepal, selected randomly using simple random sampling technique. Data collection was done in between January and February, 2015, by using anthropometric assessment and interview through use of pretested tools. Data were entered and analyzed using WHO Anthroplus software v.1.0.4 and SPSS v. 20.

Results: The prevalence of malnutrition using percentile and z-score was found to be 12.3% and 10.3%, respectively. Psychosocial dysfunction was found to be 4.3% based on caregiver's perspective and 3% on children's own assessment. No association was found to be between malnutrition and psychosocial dysfunction among the orphan and vulnerable children.

Conclusion: More than one tenth of the children were malnourished. Institutional care facilities should be concerned on lowering the malnutrition and promoting mental health through proper care support and recreational facilities.

ARTICLE HISTORY

Received November 3, 2017

Accepted December 3, 2017

Published December 23, 2017

KEYWORDS

Body mass index; children; malnutrition; psychosocial dysfunction

Introduction

Malnutrition and mental disorders are the emerging problems among the children and adolescents worldwide especially among the children and adolescents in developing countries like Nepal. Malnutrition is the lack, excess, or imbalance in intake of energy, protein, and/or other nutrients contributing to conditions like underweight, stunting, wasting, overweight, or obesity [1]. There is a dual burden of nutritional disorders in developing countries. At least 35 million overweight children are estimated to be living in developing countries

and 8 million in developed countries [2,3]. Overweight or obesity among children has been still unrecognized in Nepal which is undergoing the phase of epidemiological transition. The focus of nationally representative nutrition surveys have been on under nutrition only but not on rates of overweight and obesity [4]. Prevalence of overweight and obesity was 4.9% in 2010 in Asia [5]. It was 2.9% among adolescent girls of 15 to 19 years of age in 2011 in Nepal of which 2.6% were overweight and 0.3% girls were obese while 25.8% were underweight or thin [6].

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On the other hand, mental health problems and disorders are raising threat on the health of children. About 20% of the world's children and adolescents have been estimated to have mental health problems and disorders of which about half begin before the age of 14 years [7]. Psychosocial dysfunction is the mental illness or the impairment of psychological development and inability to function or interact with the society. Mental health problems and disorders have been found to be linked with nutritional problems and disorders [8-10]. Orphan and vulnerable children might be at more risk of malnutrition and psychosocial disorder than the rest of the children [11,12]. To the best of our knowledge, studies conducted to assess the malnutrition and psychosocial dysfunction among orphan and vulnerable children in Nepal are limited. So the study was conducted to assess malnutrition and psychosocial dysfunction among vulnerable and children as well as to determine the association between malnutrition and psychosocial dysfunction among orphan and vulnerable children in Kaski district, Nepal.

Methodology

This was an institution-based descriptive cross-sectional study done between January 2015 and February 2015 among orphans who had lost one or both parents and vulnerable children. Vulnerable children in the study include children residing at institutional care centers in Kaski district who were laborers, street children, beggars, HIV infected, destitute, or abandoned. The study was carried out among 302 orphan and vulnerable children of 6 to 18 years from 10 institutional care facilities selected from a total of 63 institutional care facilities in Kaski district. Sample size was calculated using the formula for finite population; $n = \frac{[NZ^2p(1-p)]}{[d^2(N-1) + Z^2p(1-p)]}$ by taking precision (d) of 5%, expected prevalence (p) of malnutrition 29% [6] at 95% level of confidence and population size (N) of 1,368 which was obtained as 257.11. An addition was done by assumption of 17.5% non-response rate, and the final sample size was 302. Both male and female children aged 6 to 18 years currently residing in institutional care facilities were included in the study, and those who refused to participate were excluded. Pre-testing was done among 40 children who were excluded in the final study. Data collection was done using an structured interview schedule and anthropometric assessment.

Pediatric Symptom Checklist (PSC) was used to assess the psychosocial health status or psy-

chosocial functioning of children by interviewing them and the caregivers [13]. The PSC consists of 35 items that are rated as "Never," "Sometimes," or "Often" present and scored 0, 1, and 2, respectively. The total score was calculated by adding together the score for each of the 35 items. Item scores are summed so that the total score was calculated by adding together the score for each of the 35 items, with a possible range of scores from 0 to 70. For caregiver assessment form on children aged 6 through 18, the cut-off score was 28 (28 or above = impaired; 27 or below = not impaired), whereas for the interviewed children, the cut-off was 30 (30 or above = impaired; below 30 = not impaired) [14]. An anthropometer and a weighing machine (CROWN-ISO 9001:2008 Certified) were used to measure height and weight, respectively. Weight and height were taken in standing position at the same time after removal of shoes and bulky body wears. Weight was measured to the nearest 0.5 kg after calibration to zero and height to the nearest 0.1 cm. Height and weight were entered in WHO Anthroplus software v.1.0.4 for calculating body mass index (BMI) for the specific age. Cut-off value of the 85th percentile was used for classification of overweight, 95th percentile for obesity, and <5th percentile for underweight was used in the percentile system of classification. For z-scores, cut-off value of +1 was used for classification of overweight, +2 for obesity, and <-2 was used for underweight. Collected data from interview schedule and nutritional status were entered in SPSS Version 20, and statistical analysis was done using SPSS.

Test-retest reliability of the PSC ranged from 0.84 to 0.91 and internal consistency (Cronbach's alpha) of 0.91 [15]. The study was conducted after taking approval from the Institutional Ethics Committee of Eternal University, Himachal Pradesh, India. The approval for conducting the survey in district was given by the District Child Welfare Board (DCWB), Kaski. During the survey, verbal and written consent was taken from the institutional care facility (Director/caregiver) as well as from the children. Privacy of the information was maintained and used for research purpose only.

Results

General information

The study had 302 respondents of the 6- to 18-year age group with 25% children aged 6-9 years, 47.5% aged 10-14 years, and 27.5% aged 15-19 years.

Mean age of the children was 11.6 ± 2.78 years. More than half of the children, 51%, were females followed by 49% males. All of the children were attending school, out of which, more than half, 62.3%, attended primary level, and a quarter, 25.2%, were attending lower secondary level followed by 9.3% secondary level, 1.9% higher secondary and 1.3% pre-primary. Regarding the types of institutionalized children, more than a quarter, 28.5%, were economic orphans, a quarter, 25.2%, were paternal orphans followed by 21.5% double orphan, 14.9% maternal orphans, 5.7% destitute, and 3% abandoned, whereas the proportion of child labor, street children, children in conflict, and HIV infected was 0.3% each. Regarding the causes for institutionalization, nearly one third of the children, 34.5%, were institutionalized because of the death of their parents, 31.1% due to family problem, 26.5% due to economic reasons, and 7.6% due to other reasons.

Malnutrition status of children

Out of the 302 study children, majority, 87.7%, had normal weight (5th-85th percentile), 5.3% were underweight (<5th percentile), 4.3% were overweight (85th-95th percentile), and only 2.7% were obese (>95th percentile). The overall prevalence rate of malnutrition was found to be 12.3%. In the classification using z-scores, majority of the children, 89.7%, were normal, 3.0% were underweight, 5.6% were overweight, and 1.7% were obese. The overall malnutrition using z-score was 10.3% (Table 1).

Psychosocial health status (psychosocial dysfunction/functioning)

The status of psychosocial health of the orphan and vulnerable children was assessed in terms of Caregivers' own perspective on that of the child or "interviewing each child" using same PSC under "impaired"

Table 1. Malnutrition status of children.

| Nutritional status | Frequency (n = 302) | Percent |
|----------------------------------|---------------------|---------|
| Percentile classification | | |
| Under weight | 16 | 5.3 |
| Normal weight | 265 | 87.7 |
| Over weight | 13 | 4.3 |
| Obese | 8 | 2.7 |
| z-score classification | | |
| Under weight | 9 | 3.0 |
| Normal weight | 271 | 89.7 |
| Over weight | 17 | 5.6 |
| Obese | 5 | 1.7 |

Table 2. Psychosocial dysfunction in children.

| Psychosocial health status | Frequency | Percent |
|---|-----------|---------|
| Caregivers' perspective (n = 302) | | |
| Impaired (score ≥ 28) | 13 | 4.3 |
| Not impaired (score <28) | 289 | 95.7 |
| By children's own assessment (n = 302) | | |
| Impaired (score ≥ 30) | 9 | 3.0 |
| Not impaired (score <30) | 293 | 97.0 |

or "not impaired." As per the caregivers perspective, most of the children, 95.7%, were psychosocially healthy (score 27 or below) and only very few, 4.3%, had psychosocial dysfunction/impaired (score 28 or above). As per children's own assessment, 3% children had psychosocial dysfunction (≥ 30 score) while most of the children, 97%, were mentally healthy (<30 score) (Table 2).

Association between malnutrition and psychosocial dysfunction

For measuring association between malnutrition and psychosocial dysfunction, correlation test was used. No association was found between malnutrition status and psychosocial dysfunction by both caregiver's perspective and children's own assessment ($p < 0.05$) (Tables 3 and 4).

Table 3. Association between malnutrition and psychosocial dysfunction by caregivers' perspective.

| Malnutrition status | Psychosocial health status | | r | P value |
|----------------------------------|----------------------------|--------------|------|---------|
| | Impaired | Not impaired | | |
| Percentile classification | | | | |
| Malnourished | 1 (2.7) | 36 (97.3) | 0.03 | 0.61 |
| Normal | 12 (4.5) | 253 (95.5) | | |
| z-score classification | | | | |
| Malnourished | 1 (3.2) | 30 (96.8) | 0.02 | 0.76 |
| Normal | 13 (4.3) | 289 (95.7) | | |

#Figures in parentheses indicate percentage.

Table 4. Association between malnutrition and psychosocial dysfunction by children's own assessment.

| Malnutrition status | Psychosocial health status | | r | P value |
|----------------------------------|----------------------------|--------------|-------|---------|
| | Impaired | Not impaired | | |
| Percentile classification | | | | |
| Malnourished | 1 (2.7) | 36 (97.3) | -0.01 | 0.92 |
| Normal | 8 (3.0) | 257 (97.0) | | |
| z-score classification | | | | |
| Malnourished | 1 (3.2) | 30 (96.8) | 0.01 | 0.93 |
| Normal | 8 (3.0) | 263 (97) | | |

#Figures in parentheses indicate percentage.

Discussion

In this study, BMI for age was assessed using WHO growth reference (2007) by percentile and z-score cut-off standards. Using percentile, underweight was found to be 5.3%, which was almost similar with the study conducted in China among children aged 5 to 19 years using WHO growth reference (2007) which found a prevalence rate of 7.4%. [16]. On the contrary, study conducted in urban slums of Assam found a prevalence rate of 25.70% [17]. Using z-score, the prevalence rate of underweight was found to be 3% only which was almost similar to the study conducted in Iran among 902 children less than 5 years old [18]. The lower rate of underweight in study depicts that the orphan and vulnerable children residing in institutional care facilities were getting proper care and nutrition. The prevalence of overweight and obesity using percentile cut-off was found to be 7.1% which was slightly less (8.1%) than the previous study among the higher secondary level school adolescents of Kaski district, Nepal [19]. Likewise, almost similar result was found by a study in the Netherlands among the children visiting youth health survey with prevalence rate of 7.8% [20]. Using the WHO percentile cut-off, the prevalence of overweight was found to be 4.3%, which was almost similar to the study in China which reported prevalence of 5% while it was slightly less (3.1%) in a previous study in Nepal among the subjects aged 5 to 19 years at four different locations of Nepal [16,21]. The resultant prevalence rate of overweight was almost one third (4.3%) of the value reported by the studies in India and Iran which found prevalence rate of 12% and 13.4%, respectively [22,23]. Also, the study in Bangladesh found the prevalence rate of overweight to be very high with 23.6% compared to the resultant value of the study [24]. The prevalence of obesity in the study was found to be 2.7% using percentile, which was almost similar (2.3%) with the previous study in Kaski district while it was 1.7% when z-score was used [19]. With respect to the assessment of obesity using percentile, the prevalence rate of obesity was almost double the prevalence rate of 1.2% and 1.3% found by the studies in China and Iran [16,18] and almost one third of the prevalence rate (8.2%) of the another study in Iran [23]. On contrary to the findings of this study, a study conducted in Bangladesh explained higher prevalence rate of obesity of 17.9% [24], whereas it was very less (0.6%) in a previous study conducted in Nepal among children aged 5 to 19 years [21].

With regard to the caregivers' assessment for each children and interview with children using PSC, the

prevalence of psychosocial dysfunction was found to be 4.3% and 3%, respectively. These seem very different from the World Health Report of World Health Organization which varied from 7 to 172 per 1,000 children and another study which varied from 25-356 per 1,000 in field studies [25,26]. The prevalence of psychosocial dysfunction by caregivers' perspective was almost one third (4.3%) of the prevalence rate of 13% found in a study conducted in the United States and Canada using PSC in school aged pediatric outpatients children [27]. Using children's PSC, the prevalence of psychosocial dysfunction was one-seventh (3%) of the prevalence rate (20%) found by a study in United States [28].

No relationship between the nutritional status and psychosocial health of the children while in the study conducted in Spain found association between nutritional and psychosocial status [29]. This might be because of better nutrition and psychosocial care provided to the children by the institutional care facilities. Moreover, most of the institutional care facilities were urban-based, funded and had access to all kinds of facilities and are controlled by DCWB, Kaski, in its quality assurance.

Conclusion

More than one tenth of the orphan and vulnerable children residing at institutional care facilities in Kaski district were malnourished. Psychosocial dysfunction among children was found to be 4.3% and 3% on caregivers' perspective and children's own assessment, respectively. Malnutrition and psychosocial dysfunction were not found to be associated with each other. Institutional care facilities should be concerned on lowering the malnutrition and promoting mental health through proper care support and recreational facilities. The study recommends for further studies with larger study area for determining nutritional and mental health problems among orphans and vulnerable children.

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