

The incidence of malnutrition in children under 5 years old at 2 communes in Tu Ky District, Hai Duong Province in 2023

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ABSTRACT

Objective. The study was done to estimate the incidence of malnutrition in children under 5 years old in Tu Ky district, Hai Duong Province in 2023. **Subjects and Method.** Subjects included 602 children under 5 years old in the study setting. The method was a cross-sectional study. **Results.** The incidence of underweight was 6.1%, stunting was 12.3%, and wasting was 10.8%. Underweight affected more females than males (6.4% so vs 5.9%), similarly, wasting affected more females than males (11.0% vs 10.6%). In contrast, stunting affected more males than females (14.2% vs 10.4%). The incidence of 3 kinds of malnutrition gradually increased and peaked when children were 2 to 3 years old, then the incidences gradually decreased when children were 4 to 5 years old. **Conclusions.** Malnutrition is a common disease in children under 5 years old in Tu Ky. The disease occurs in both males and females but is moderately common.

Keywords: Malnutrition, underweight, stunting, wasting, children under 5 years old

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INTRODUCTION

Malnutrition is due to the lack of protein-energy and micronutrients. The disease is common in children under 5 years old and is a public health issue. Malnutrition can affect the physical, mental, and intellectual development of children and can leave serious consequences for children and society worsening the image of the nation as a race and in severe cases can lead to [1].

In developing and underdeveloped countries, about 22.9% of children under 5 years old are stunted. From 2000 to 2016, stunting gradually decreased from 33.7% to 22.9% and the number of stunted children decreased from 198 million to 155 million. One in 2 children is stunted in Asia and 3 in 3 children are stunted in Africa [2].

The study of Kanae Nomura et al [3] in Timore-Leste on 4,581 children under 5 years old indicated that about 40% of children were stunted. Nguyen Thanh Loan [4] showed that 12.6%, 10.6 and 14.3% of children were malnourished at the Nutritional Clinic of Haiphong Children in 2023.

Tu Ky district, Hai Duong Province is basically an agricultural district and people live by farming. Nowadays, industrialization is occurring in the district. Does this alteration have any impact on the nutritional situation? That is a question we need to answer. The research was conducted to aim at the following objective:

To estimate the incidence of malnutrition in children under 5 years old at 2 communes An Than and Van To, Tu Ky Hung Yen in 2023.

SUBJECTS AND METHODS

Subjects, Place, and time for research

All children under 5 years old were in 2 communes such as An Thanh, Van To, Tu Ky district, and Hai Duong from January 1st, 2023 to September 1st, 2023.

Inclusion criteria

Children under 5 years old were in the 2 above communes and their families agreed to participate in the study.

Exclusion criteria

Children with genetic diseases or congenital malformations of digestive, cardiovascular, or neurological systems; children with kyphosis, and traumatic amputation; children were put in a cast to eliminate confounding factors.

Method

Study design

A cross-sectional study

Sample size and sampling process

- Sample size: whole children under 5 years old in the study setting.
- Sampling process: The sample was selected by the convenient method.

Variables and indices

- Information about subjects
 - + Age
 - + Gender

- Incidence of malnutrition
 - + The incidence of underweight, stunting, and wasting
 - + The distribution of underweight, stunting, and wasting according to age and gender
 - + The degree of underweight, stunting, and wasting according to age and gender

Tools and methods for information collection

Age compute: month age = (investigation day – birthday)/ 365 days (Performance on SPSS 22.0).

Anthropometrics (Weight and height) were done according to the criteria of the World Health Organization.

Evaluation of nutritional status of children

We applied for the classification of WHO-2006. Underweight, stunting, and wasting were defined as Zscore of W/A, H/A, and W/H less than - 2SD.

The degree of underweight, stunting, and wasting were classified as follows [5]:

- Moderate: from - 2SD to <- 3SD
- Severe: less than - 3SD

Data analysis

SPSS 22.0 was used to enter and analyze data. Percentages were computed and compared by using the χ^2 test, the difference was significant when p value is less than 0,05.

RESULTS

The incidence of malnutrition in children under 5 years old in Tu Ky in 2023

Some information about study subjects

Among 602 study subjects, group 0-<12 months (132 children) was 21.9%, group 12-<24 months (157 children) represented 26.1%, group 24-<36 months (132) represented 21.9%, group 36-<48 months (112 children) represented 18.6%, and group 48-<60 months (69 children) accounted for 11.5%.

Boys represented (n=303) 50.3% and girls were 47.9%.

The incidence of malnutrition

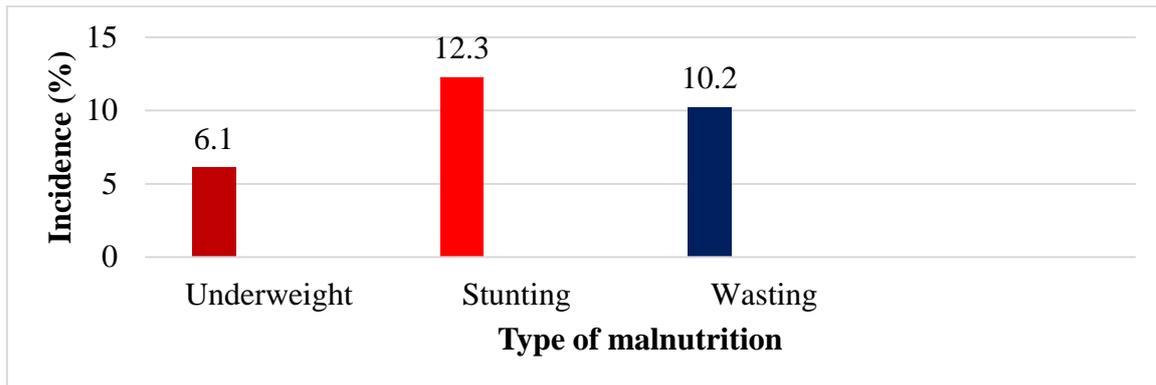


Figure 3.1. The incidence of underweight, stunting, and wasting (n=602)

The figure showed that stunting (74 cases) was 12.3%, wasting (65 cases) was 10.8% and underweight (37 cases) accounted for 6.1%.

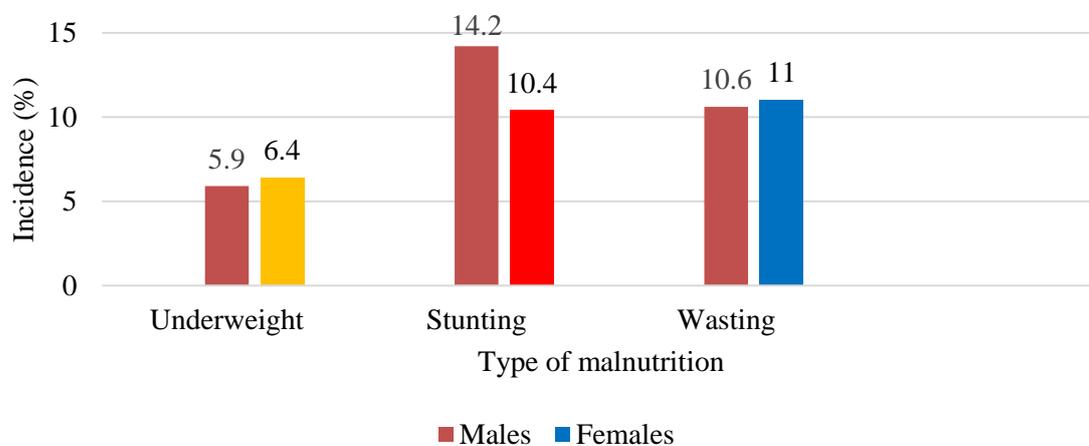


Figure 3.2. The incidence of underweight, stunting, and wasting according to gender (n=602)

The figure indicated that being underweight affected more males than females (19/18 cases and 6.4% vs 5.9% respectively). Stunting affected more males than females (43/31 cases and 14.2% vs 10.4% respectively). In contrast, wasting affected more females than males (33/32 and 11% vs 10.6% respectively)

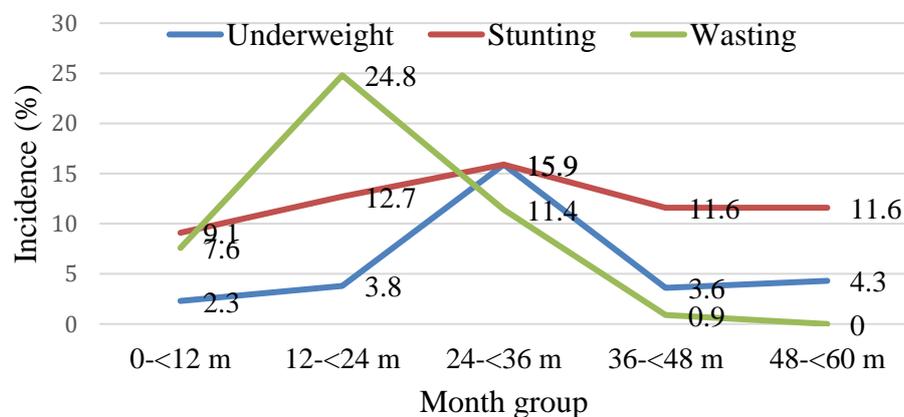


Figure 3.3. The incidence of underweight, stunting, and wasting according to age group (n=602)

This figure showed that underweight incidence was highest at 15.9% in group 24-<36 m and lowest in group <12 m at 2.3%. The incidence of stunting was highest at 15.9% in group 24-<36 m and lowest in group < 12 m at 9.1%. The incidence of wasting was highest at 24.8% in group 12-<24 m, group 48-<60 m there was no case of wasting. All kinds of malnutrition peaked at group 24-36 m and gradually decreased when children were 5 years old (The difference between group ages was statistically significant with $p < 0.05$ (Fisher-Exact test)).

Table 3.1. Degree of underweight, stunting, wasting by gender (n=602)

Kind of malnutrition	Degree	Males (n, %)	Females (n, %)	Total
Underweight	Moderate	17 (5.6)	17 (5.7)	34
	Severe	1 (0.3)	2 (0.7)	3
Stunting	Moderate	37 (12,2)	25 (8.4)	62
	Severe	6 (2.0)	6 (2.0)	12
Wasting	Moderate	27 (8.9)	28 (9.4)	55
	Severe	5 (1.7)	5(1.7)	10

Moderate underweight affected the same in boys and girls (5.6% vs 5.7% respectively). Severe underweight affected more girls than boys (0.7% vs 0.3%). Moderate stunting affected more boys than girls (12.3% vs 8.4% respectively). The rate of severe stunting in boys and girls was similar (2%). Moderate wasting affected more girls than boys (9.4% vs 8.9% respectively). Severe wasting affected the same in boys and girls (1.7%). The difference in underweight, stunting, and wasting rate was not statistically significant with $p > 0.05$.

Table 3.2. The degree of underweight, stunting, and wasting according to age group (n=602)

Age group (Month)	Underweight		Stunting		Wasting	
	Moderate (n, %)	Severe (n, %)	Moderate (n, %)	Severe (n, %)	Moderate (n, %)	Severe (n, %)
0-<12	3 (8.8)	0 (0.0)	11 (8.3)	1 (0.8)	7(5.3)	3(2.3)
12-<24	5 (3.2)	1(0.6)	16(10.2)	4(2.5)	32(20.4)	7(4.5)
24-<36	20 (15.2)	1(0.6)	15 (11.4)	6(4.5)	15 (11.4)	0(0.0)
36-<48	4(3.6)	0(0.0)	13(11.6)	0(0.0)	1(0.9)	0(0.0)
48-<60	2 (2.9)	1(1.4)	7 (10.1)	1(1.4)	0(0.0)	0(0.0)
Total	34 (5.6)	3(0.5)	62 (10.3)	12(2.0)	55 (9.1)	10(1.7)

This table showed that moderate underweight was highest in 24-<36 m 15.2%, severe underweight was highest in 48-<60 m 1,4%. Moderate stunting increased gradually when children were 2, 3, and 4 years old and decreased when children were 5 years old. Severe stunting was highest in 24-<36 m. Moderate wasting was highest in 12-<24 m with a rate of 20.4%, then the rate of group 24-<36 m was 11.4%. Severe wasting was highest in group < 12 m with a rate of 5.3%.

DISCUSSIONS

Some information about study subjects

Among 602 children, 21.9% were in the 0-<12 m group, 26.1% were in the 12-<24 m

group, 21.9% were in 24-<36 m groups, 18.6% were in 36-<48 m group, and 11.5% were in 48-<60 groups. Pham Viet Chuong (2021) [6] showed that the age group less than 1 year old participated in the study with

the lowest rate 5.2% while in our study, the rate of children in the 48-<60 m group was the lowest 11.5%. Similarly, Doan Ngoc Thanh (2022) [7] also found that children in the less than 12m group had the lowest rate 12.7%. Nguyen Thi Thanh Loan (2022) [4] showed that children in the 48-<60 m group had the lowest rate (5.7%).

Males represented 50.3% while females accounted for 49.7%. These results were similar to that of Pham Viet Chuong [6]: males were 58.5% and females 41.5%, Doan Ngoc Thanh [7]: Males were 53.6% and females were 46.4%, Nguyen Thi Thanh Loan: males were 53.2% and females accounted for 48.8%. To explain the gender difference, we think it may be due to the gender imbalance that is common in Vietnam.

Incidence of malnutrition in children under 5

Incidence of underweight, stunting, and wasting

The incidence of underweight, stunting, and wasting were 6.1%, 12.3%, and 10.8% respectively (figure 3.1). According to the classification of malnutrition in the community: Underweight less than 10% and stunting less than 20% were in mild degree but the rate of wasting that was 10-14% was in high degree (hình 3.1).

According to studies done in Hai Phong and Quang Ninh, underweight represented 5.8% - 10.6%, stunting was 12.6% - 17.3%, and wasting was 4.5% -17.3% [4], [7]. Thus, our research rate of 3 kinds of malnutrition in children under 5 years old was similar to those of the authors mentioned above.

In South Africa, Perpetua Modjadji, and Josephine Mashishi [8] when studying 404 children under 5 years old who went to see

doctors at health service in Limpopo showed that stunting represented the highest rate with 45.3%, underweight was 29.0%, and wasting represented the lowest rate 12.6%. All three rates of these studies were much higher than our study rate.

The study of Michael Boah et al [9] in Ghana on 2720 pairs of mother and child aged from từ 0-59 m to estimate the incidence of malnutrition and some risk factors indicated that the incidences of underweight, and wasting were 10.4% and 5.3%, and the highest rate of stunting was 18.4%. These results were similar to those of our results.

Incidence of malnutrition according to age group and gender

The study of Underweight affected more females than males (6.4% vs 5.9%) and wasting affected more females than males (11.0% vs 10.6%). In contrast, more males than females were affected by stunting (14.2% vs 10.4%) (hình 3.2). According to Perpetua Modjadji and Josephine Mashishi [8], more males were affected by stunting (51,7%) and underweight than females.

The study of Anil Sigdel et al [10] in the rural area of Chitvan district, Nepal about risk factors from mothers to underweight showed that more than half (51.6%) of children were females.

All three kinds of malnutrition gradually increased and peaked when children were 2 to 3 years old and decreased when children were 4 to 5 years old. The study by Perpetua Modjadji and Josephine Mashishi [8] also showed that the rate of 3 kinds of malnutrition gradually increased when children were 2 to 3 years old and gradually decreased when children were 4 to 5 years old. This comment was similar to ours. The explanation for this rule is that the factors causing malnutrition affected the children in

the first year, leaving the consequences at 2 to 3 years old, and then the children were intervened, or natural progression led to a decreased rate when children were 4 to 5 years old.

According to Nguyen The Thanh Loan [4], three kinds of malnutrition gradually increased according to age groups and peaked when children were in the 36-<48 m group and decreased in the 48-<36 m group. Many females than males were affected as underweight and stunting, Wasting affected equally males and females.

Degree of malnutrition according to age group and gender

The degree of underweight in males and females was very similar to each other but underweight affected more males than females. Stunting affected more males than females, both males and females equally affected both males and females. More females were affected by wasting than males, and the rates of male and female wasting were similar to each other (Table 3.1).

The moderate incidence of malnutrition of three kinds of malnutrition highly increased and peaked when children were 2 to 3 years old. We did not see any cases of severe wasting in group 4 to 5 m age group (table 3.2).

Kajol Dahal et al [11] studied severe and acute wasting in children under 5 years in Satar of Jhapa, Nepal from 2019 to 2020 and found that among 664 children in the 6-59 m group, the incidence of acute severe wasting was a little bit high 7.53%. Our result showed that this result of 1.7% in both males and females.

The study of the recurrence of acute and severe malnutrition and some risk factors in children under 5 years old at Hadiya,

southern Ethiopia; Abera Lambebo et al [12] studied in 2014/2015 and 2019/2020 to find out the recurrence of acute/severe malnutrition after 5 years showed that the recurrence rate was 9.6%, 95% CI from 7.7% to 11,7%. Risk factors relating to the recurrence were edema signs on admission and children in the 6-11 m group.

According to Pham Viet Chuong [6], moderate underweight, stunting, and wasting were 95.7%, 79.7%, and 77.8% respectively. Severe malnutrition of underweight, stunting, and wasting were 4.3%, 20.3%, and 22.2%.

According to Nguyen Thi Thanh Loan [4], three kinds of malnutrition had higher moderate rates peaked at 36-<48 m group, the difference in malnutrition was not statistically significant according to kind of malnutrition.

CONCLUSIONS

The incidence of underweight was 6.1%, stunting was 12.3%, and wasting was 10.8%. Being Underweight affected more females than males (6.4% vs 5.9%) and wasting affected more females than males (11.0% vs 10.6%). In contrast, stunting affected more males than females (14.2% vs 10.4%).

The incidence of 3 kinds of malnutrition gradually increased and peaked when children were 2 to 3 years old and decreased gradually when children were 4 to 5 years old.

Three kinds of malnutrition were moderately common, gradually peaked when children were 2 to 3 years old, and gradually decreased. There was no wasting in the age group 4-5 years old.

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