Prevalence and Associated Factors of Underweight Status among Children Aged 2-4 Years at Child-Care Centers of Wiang Subdistrict, Chiang Khong District, Chiang Rai Province

Pakjira Wongpradid[1], Donhatai Jaturakhachendecha, B.N.S.[2], Sangkae Chamnanvanakij, M.D.[1]
[1] School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand
[2] Chiang Khong Crown Prince Hospital, Chiang Khong 57140, Thailand

Received 11 August 2020 • Revised 24 September 2020 • Accepted 30 October 2020 • Published online 1 January 2021

Abstract:

Background: Underweight is an important problem among preschool age children and mostly related to undernutrition. Because nutritional problems among children living along the border of Thailand may differ from those living in the city, a survey to identify the prevalence and associated factors is needed.

Objective: The study aimed to determine the prevalence and factors associated with underweight status among children aged 2-4 years living in Chiang Khong District of Chiang Rai Province

Methods: We conducted a cross-sectional study among children attending six child-care centers in Wiang Subdistrict, Chiang Khong District, Chiang Rai Province. The child's current weight and height were reviewed from a growth record program. Parents responded to a questionnaire about nutritional knowledge and practices.

Statistical analysis: Descriptive statistics was used to analyse population characteristics. Comparison between groups were analysed using Chi-Square test or Fisher's Exact as appropriate.

Results: One hundred and seventy children were enrolled. In all, 52 (30.59%), 112 (65.88%) and 6 (3.53%) children were categorized as underweight, normal and overweight, respectively. Hill tribe was the only factor associated with underweight children. Parents of normal or overweight children had better knowledge than those of underweight children including the importance of daily breakfast, consuming milk daily, meat and eggs diet and having seasonal fruits instead of sweets or snacks. Accordingly, normal or overweight children received more appropriate daily nutrition compared with underweight children including daily breakfast, fruit, meat, eggs and iron-rich foods.

Corresponding author: Sangkae Chamnanvanakij, M.D.
School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand
E-mail: chamnanvanakij@gmail.com
GMSMJ 2021; 1 (1): 11-17

Conclusion: Nutritional knowledge and practices are important factors related to growth among children living at Chiang Khong District, Chiang Rai Province.

Keywords: underweight, day care center

Background

Currently, a report on the nutritional situation of Thai children described a double increase of undernutrition status children under 5 years (stunted 11% and wasted 5%)[1]. Undernutrition is an important factor affecting a child's physical and mental development. In addition, undernutrition status children are more vulnerable to disease and death[2]. For those reasons, good nutrition should be started from infancy to early childhood (1 to 5 years of age)[3]. Nutritional status of children aged 1 to 5 years is an important indicator of overall health and a fundamental influence to reach their full potential of child development.

Wiang Subdistrict of Chiang Khong District, Chiang Rai Province is an area of multinational populations living both in town and hill tribe areas. Although many child-care centers are located in this area, the nutritional status of children has not been well studied. The study aimed to determine the prevalence and associated factors of underweight status among children aged 2 to 4 years living in Wiang Subdistrict, Chiang Khong District of Chiang Rai Province. The result may be useful for planning guidelines to solve the underweight problem of children living in this area.

Methods

We conducted a cross-sectional study at six child-care centers in Wiang Subdistrict, Chiang Khong District, Chiang Rai Province. After obtaining parental consent, we reviewed the data collected of children aged 2 to 4 years from the INMU-Thai Growth Program including the child's age, sex, height, and weight. We categorized children's status in three groups, underweight, normal and overweight, based on weight index for age and height references of the Department of Health[4]. Parents or caregivers responded to the questionnaire about nutrition knowledge and food handling practices for their child. Levels of nutrition knowledge were classified as good, average and poor using total scores of 6 to 8, 3 to 5 and 0 to 2, respectively. Levels of food handling practices were classified as very good, good, average and need improvement using average scores of 3.25 to 4.00, 2.50 to 3.24, 1.75 to 2.49 and 1.00 to 1.74, respectively.

Statistical analysis

Descriptive statistics was used to analyse population characteristics. Comparison between groups were analysed by using Chi-Square test or Fisher's exact test as appropriate.

Results

In all, 170 children and caregivers were recruited from six child-care centers. Thirty-five (20.59%) and 135 (79.41%) were town and hill tribe populations, respectively. Children were categorized in three groups, 52 (30.59%), 112 (65.88%) and 6 (3.53%) as underweight, normal and overweight, respectively (Table 1).

Table 1 Data of normal/overweight and underweight children

Data	Normal/overweight n (%)	Underweight n (%)	P value*
Total children	118	52	
Caregiver			0.700
Parents	97 (82.2)	44 (84.6)	
Relatives or others	21 (17.8)	8 (15.4)	
Age of caregiver (year)			0.578
< 30	49 (41.5)	21 (40.4)	
30-39	39 (33.1)	16 (30.8)	
40-49	16 (13.6)	11 (21.2)	
≥ 50	14 (8.3)	4 (7.7)	
Education of caregiver			0.289
High school or lower	58 (49.2)	30 (57.7)	
Above high school	56 (47.5)	22 (42.3)	
No data	4 (3.4)	0 (0.0)	
Sibling number			0.630
1	25 (21.2)	10(19.2)	
2-4	79 (66.9)	33 (63.5)	
< 4	14 (11.9)	9 (17.3)	
Family income (Baht/month)			0.394
< 5,000	38 (32.2)	13 (25.0)	
5,000-10,000	53 (44.9)	30 (57.7)	
> 10,000	25 (21.2)	9 (17.3)	
No data	2 (1.7)	0 (0.0)	
Population			< 0.001
Town	35 (29.7)	0 (0.0)	
Hill tribe	83 (70.3)	52 (100.0)	
Gender	54 (45.8)	25 (48.1)	0.868
Male			
Birth weight (gram)			0.813
< 2,500	8 (6.8)	5 (9.6)	
2,500 – 3,500	98 (83.1)	42 (80.8)	
> 3,500	12 (10.2)	5 (9.6)	

* *Chi-square test*

No differences of family and child history were found between the normal/overweight and underweight groups. However, all underweight children were hill tribe people (Table 1).

The overall levels of knowledge did not differ between the normal/overweight and underweight groups. However, caregivers of underweight children exhibited significantly poorer knowledge on some items i.e. importance of daily breakfast and daily milk and protein intake for children and providing seasonal fruits instead of sweets or snack food (Table 2).

The overall levels of food handling practices did not differ between the two groups. However, caregivers of normal/overweight children followed nutrition principles significantly better than those of underweight infants especially providing everyday breakfast, fruit, meat, eggs and iron-rich foods (Table 3).

When we compared nutrition knowledge between caregivers living in town and hill tribes, no difference was found between the two groups. However, differences in food handling practices comprised eating breakfast and fruit daily (data not presented).

Discussion

Although related studies described the influence of family characteristics and child history on the nutritional status[5-14], we found no differences of those factors between the normal/overweight and underweight groups in this study. However, one noticeable factor was all underweight children were hill tribe people, e.g., Hmong, Yao and Tai Lue, living in

Table 2 Caregiver's nutrition knowledge of normal/overweight and underweight children

Nutrition knowledge	Normal/overweight n (%)	Underweight n (%)	P value*
Total caregivers	118	52	
Fat and vegetable or animal oils are not necessary for children	69 (58.5)	32 (61.5)	0.738
Vegetables provide energy for the body	22 (18.6)	12 (23.1)	0.506
Flour, rice and sugar help to repair the worn parts of the body	32 (27.1)	16 (30.8)	0.626
Breakfast is an important meal	116 (98.3)	47 (90.4)	0.017
Daily milk intake is suitable for the growth of children	117 (99.2)	47 (90.4)	0.004
Meat and eggs are essential food for children	118 (100.0)	47 (90.4)	0.001
Children should have seasonal fruits instead of sweets or snacks	115 (97.5)	45 (86.5)	0.005
Eating fruit and vegetable is better for the digestive system	117 (99.2)	49 (94.2)	0.051
Levels of nutrition knowledge			0.592
- Very good	75 (63.6)	30 (57.7)	
- Good	41 (34.7)	20 (38.5)	
- Poor	2 (1.7)	2 (3.8)	

* *Chi-square test*

the hills. These tribes had different family characteristics and lifestyle from people living in town. They often had many children and low incomes. In addition, living in the hills may present a limitation in providing adequate nutrients for their children.

This study demonstrated the effect of caregivers' nutrition knowledge on food handling practices for children which corresponded to the results of related studies[6,13]. From that result, some issues should be emphasized, i.e., providing five main food groups of nutrients is essential for child growth and development and the importance of daily breakfast.

From the above, we realized that providing nutrition knowledge for caregivers is the key success factor to modify food practice behavior and finally to solve the underweight problem. However, poverty and language barriers are challenging problems among hill tribes. Providing education using local language and monitoring food handling practices at home may provide solutions. In addition, nutritional support including daily breakfast and adequate food supplement should be provided at child-care centers.

Currently, there are some efforts to improve growth and nutritional status of children at these child-care centers, e.g., monitoring serial growth, supporting nutritional practices and providing education. Our study could not demonstrate any outcome of the activities performed due to the study design and time limitation. However, we believe that the result of this study will be the starting point revealing the underweight problem among children especially hill tribes living along the Thai border. Such evidence may lead to creating policies or guidelines to improve nutritional status and overall health of hill tribe children and those living along the Thai border in the future.

Table 3 Caregiver's food handling practice for normal/overweight and underweight children

Food handling practice	Normal/overweight n (%)	Underweight n (%)	P value*
Total caregivers	118	52	
The child eats 3 meals every day	96 (81.4)	36 (69.2)	0.063
The child eats breakfast every day	88 (74.6)	28 (53.8)	0.006
The child eats at least 3 scoops of rice or flour a day	64 (54.2)	24 (46.2)	0.322
The child eats vegetable every day	65 (55.1)	22 (42.3)	0.134
The child eats fruit every day	74 (63.7)	22 (42.3)	0.012
The child eats meat every day	79 (66.9)	26 (50.0)	0.030
The child drinks at least 1 glass or box of milk a day	97 (82.2)	37 (71.2)	0.082
The child eats at least 1 egg every day	69 (58.5)	17 (32.7)	0.003
The child eats foods containing iron e.g. liver, blood, etc.	28 (23.7)	5 (9.6)	0.030
Levels of food handling practice			0.174
- Good-very good	116 (98.3)	50 (96.2)	
- Average-need improvement	2 (1.7)	2 (3.8)	

* *Chi-square test*

Acknowledgement

We would like to thank all staff at the health promotion, primary care division of Chiang Khong Crown Prince Hospital and at the child-care centers for supporting information and facilitating activities of this research.

References

1. Unicef Thailand Annual Report 2018 [Internet]. [cited 2019 Mar 23]. Available from: https://www.unicef.org/thailand/media/2171/file
2. Malnutrition. Unicef for every child [Internet]. 2020 [cited 2020 July 20. Available from: https://data.unicef.org/topic/nutrition/malnutrition/
3. Suchaxaya P, Niyomkar S, Ngamsuoy A. Looking at Health Promotion and Disease Prevention Services for Children 0-5 Years Old in the Periods before and after the Introduction of the Universal Health Coverage System [Internet]. 2007 [cited 2019 Mar 21]; Available from: http://kb.hsri.or.th/dspace/handle/11228/90
4. Graph reference criteria for the child's growth. Bureau of Nutrition, Department of Health, [Internet]. 2015 [cited 2019 Mar 25]. Available from: http://nutrition.anamai.moph.go.th/ewt_news.php?nid=723
5. Nuengruetai Kue-iad N, Chaimay B, Woradet S. Early Childhood Development among Thai Children Aged Under 5 Years: A Literature Review. South Coll Netw J Nurs Public Health [Internet]. 2018 [cited 2019 Mar 21];5(1):329–42. Available from: https://www.tci-thaijo.org/index.php/scnet/article/view/113003
6. Sirinam W. Factors influencing nutritional status of Children development centers in Banklang Subdistrict Municipality Sanpatong District, Chiang Mai Province [Internet]. Chiang Mai Rajabhat University; [cited 2019 Mar 20]. Available from: http://www.graduate.cmru.ac.th/core/km_pic/399.pdf
7. Khejonchit P, Chutiman N, Kumphon B. Factors associated with under-nutrition of preschool children in Kuchinarai district, Kalasin province.KKU J Public Health Res [Internet]. 2013 [cited 2019 Mar 19];168–75. Available from: https://www.tci-thaijo.org/index.php/kkujphr/article/view/117993
8. Degarege D, Degarege A, Animut A. Undernutrition and associated risk factors among school age children in Addis Ababa, Ethiopia. BMC Public Health [Internet]. 2015 Apr 12 [cited 2019 Mar 24];15(1):375. Available from: https://doi.org/10.1186/s12889-015-1714-5
9. Pokhrel AU, Parajuli SB, Acharya A. Prevalence and Associated Factors of Undernutrition among Under-Five Children of Bharatpur Municipality of Chitwan District, Nepal. Birat J Health Sci [Internet]. 2017 [cited 2019 Mar 24];2(3):266–72. Available from: https://www.nepjol.info/index.php/bjhs/article/view/18941
10. Akombi BJ, Agho KE, Merom D, Hall JJ, Renzaho AM. Multilevel Analysis of Factors Associated with Wasting and Underweight among Children Under-Five Years in Nigeria. Nutrients [Internet]. 2017 Jan [cited 2019 Mar 24];9(1):44. Available from: https://www.mdpi.com/2072-6643/9/1/44

11. Ketkowit B. Nutritional status and development of 3-5 year-old children in Regional Health Center 4 area. J Nutr Assoc Thail [Internet]. 2017 Dec 31 [cited 2019 Mar 24]; 52(2):1–15. Available from: https://www.tci-Thaijo.org/index.php/JNAT/article/view/116094
12. Fentahun W, Wubshet M, Tariku A. Undernutrition and associated factors among children aged 6-59 months in East Belesa District, northwest Ethiopia: a community based cross-sectional study. BMC Public Health. 2016 13;16:506.
13. Uengarporn N. Nutritional status in preschool children in area of Suranaree University of Technology [Internet]. Institute of Medicine Suranaree University of Technology; [cited 2019 Mar 20]. Available from: http://sutir.sut.ac.th:8080/sutir/handle/123456789/4643
14. Tannim H. Family factors and children's nutritional status of child development centers in Thasud subdistrict,Mueang Chiang Rai district, Chiang Rai province [Internet]. [cited 2019 Aug 24]. Available from: http://cmuir.cmu.ac.th/handle/6653943832/13908