

PICKY EATING AND NUTRITIONAL STATUS IN CHILDREN AGED 1 TO 5 YEARS IN A CITY OF CENTRAL REGION, VIETNAM

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Abstract

Under-nutrition is still a major contributor to disease and poor growth in vulnerable populations. Prolonged undernutrition affects physical health, mental and social development of children and exacts a heavy cost to their families and society at large. Insufficient food availability is an important cause of undernutrition, the ability or willingness to consume available foods is another major factor. Picky eating is one of the behaviors that children with difficulty or not to accept foods. Picky eating is relatively common among infants and children, often causing anxiety for parents and caregivers. Picking eating is often linked to nutritional problems, and is also the cause that parents take their child to doctor for examination and consultation. **Objectives:** To describe prevalence of picky eaters and nutritional status of children aged 1 to 5 and to find out the relationship between picky eating and nutritional status of children. **Methods:** This was a cross-sectional study. A sample size of 1100 children aged 1 to 5 had been selected and studied by using questionnaire for interviewing parents or caregivers to estimate prevalence of picky eaters; measuring weight, length/height to assess nutritional status of children. **Results:** Prevalence of picky eaters based on parents or caregivers' opinion and according to researchers were 43.3% and 22.2%, respectively. The most common signs of picky eating reported by parents or caregivers were eat slowly, mealtime lasted for over 30 minutes (39.7%), eat less (31.7%), keep food in mouth (23.5%). 35.9% of picky eaters had signs at the period of complementary feeding. Prevalence of underweight, overweight and stunting were 7.5%, 3.6% and 10.9%, respectively. There was no relationship between picky eating and stunting ($p>0.05$) but strong relationship between picky eating and underweight ($p<0.001$), wasting ($p<0.001$). Picky eaters were 4.02 times at risk of underweight compared to non-picky eaters (95% CI: 2.54-6.36). **Conclusions:** Picky eating is common and a risk factor of underweight, wasting. It should be a big concern to public health workers.

Keywords: Picky eating, nutritional status, children aged 1 to 5, Vietnam.

1. INTRODUCTION

Eating is to meet the essential needs of human being and to sustain the life, growth and development. In every different stage of life, a human being will have different needs for energy and nutrients. For children, nutrition during the first years of life has important implications for the development process as well as the quality of later life [1]. Socio-economic and psychological status impacts on nutritional status. Human being is easily influenced by poor nutrition during the rapid growth period of body. During growth stages, if the essential nutrients are not met, it may cause permanent damage to tissues and organs.

Although in the recent years, there have been many programs, projects, and efforts from the whole world to improve children's nutritional status; undernutrition is still a major contributor to disease and poor growth in vulnerable populations. Prolonged undernutrition affects the physical health,

the mental and social development of children. In addition, it exacts a heavy cost to their families and society at large. Although insufficient food availability is an important cause of undernutrition, the ability or willingness to consume available foods is another major factor [2]. Picky eating/fussy eating is one of the behaviors that children with difficulty or not to accept foods. Picky eating is relatively common among infants and children, often causing anxiety for parent and caregivers. Picking eating is often linked to nutritional problems [3] and is also the cause that parents take their child to doctor for examination and consultation⁽⁴⁾. Picky eating is a risk factor for the development of an eating disorder⁽⁵⁾.

In the world, there are some research on this subject and it shown that picky eating is very common in children. Picky eating has been reported to be as high as 50% in children aged 19 to 24 months in a study from the USA. Between 20% and 60% of

parents stated that their young children are not eating optimally [6].

There is little information on picky eating and feeding difficulty in Asia. In Singapore, a study had been conducted to determine the key aspects of picky eating and feeding difficulties among children aged 1 to 10 years and the impact on caregivers. 49.2% of them had been defined as picky eaters [7].

In Vietnam, for many mothers, meal times are challenges for their patience and sufferance, even “a struggle” between parents and children. For some families, it is also the reason for family conflicts ⁽⁸⁾. The aim of this study were to describe prevalence of picky eating and nutritional status of children aged 1 to 5 years in Hue city and to find out the relationship between picky eating and nutritional status of these children.

2. METHODS

Participants and method

1100 children from 12 to under 72 months old living in Hue city and 1046 parents or caregivers were recruited to the study. A cross-sectional study was conducted from January to September 2014, using questionnaire to interview parents or caregivers about picky eating and measure weight, length/height to assess the nutritional status of children.

Measures

In addition for demographic information obtained from interviewees, the following measures were obtained:

Picky eating

In Vietnam, up to present (2013), there is still no articles published on this topic. After referencing literature and implementing pilot for some children in Hue city, we offer some indicators as followed:

Main indicators

1. Slowly eating, mealtime lasting for over 30 minutes.
2. Accepting only a few types of food
3. Unwilling to try new foods
4. Have some negative behaviors at mealtime: had tantrums, pretending to feel of nausea or not open mouth when seeing food...
5. Holding food in the mouth
6. Number of meals per day or amount of food is less than that of children at the same age.

Secondary indicators

1. Refusing to eat fruit and vegetables
2. Eating snacks instead of meals
3. Eating sweets and fatty foods instead of healthy foods

4. Required food prepared in specific ways

The child will be defined as picky eater if having at least 3 indicators, in which at least 2 main indicators. All of the indicators must be lasting for at least one month [8; 9].

To identify picky eaters first we asked mother or caregiver “Is the child picky eater? “. If the answer was “yes” then interviewees was also asked to describe some signs of picky eaters as mentioned above. The child was classified as picky eater if he had enough criteria as aboved. Besides, the information about duration of each sign and of picky eating period, causes of picky eating, number of meals per day also is obtained to know more about picky eating.

Anthropometrics

Children’s length/height and weight was obtained to assess nutritional status, using WHO AnthroPlus software ⁽¹⁰⁾.

Statistical analysis

SPSS version 20 and Excel 2010 softwares had been used to analyze data. t student test was used for comparison differences between average values of the 2 groups and χ^2 test for comparison prevalences between 2 or more groups of nonparametric variables. In case there is one value that is less than 5, Fisher test will be used ⁽¹¹⁾.

Analysis of multivariate logistic regression to determine the coefficients β and p, thereby setting the equation determining picky eating. Select the cutoff point for determining the value of picky eating diagnosed with sensitivity and high specificity. The area under the ROC curve to determine the accuracy of the equation has established [12].

3. RESULTS

Characteristics of studied subjects

Characteristics of children

We studied 1100 children from 1 to 5 years old, in which 52.5% was male and 86.2% was the first or second child of the family. Prevalence of children aged 1, 2, 3, 4 and 5 were 24.5%, 26.2%, 19.4%, 21.6% and 8.3%, respectively.

Characteristics of interviewees (parents/ caregivers)

There was 26 pairs of brother and sister in a family, so the number of interviewees was 1074 (8.8% male, 91.2% female). 78.1% of them was mother. Some of the most occupation of them were civil servants (25.4%), business (23.0%), housewife (22.9%). 84.8% of the interviewees had educational level from secondary school and higher, however, there was still 0.9% of them was illiteracy. The poor famili-

es accounted for 5.2%.

Picky eating and nutritional status of children from 1 to 5 years old

Picky eating

Prevalence of picky eaters

Prevalence of picky eaters according to caregivers' perception was 43.3%. However, when using criteria given by researcher, prevalence of picky eaters was 22.2%. Female was statistical higher than male ($p < 0.001$).

Average duration of picky eating was 286 ± 107 days.

Signs of picky eating

The most common signs of picky eating reported by parents or caregivers were eating slowly, mealtime lasted for over 30 minutes (39.7%), eating less (31.7%), holding the food in the mouth (23.5%), difficult to feed the child, the child just ate if only he was forced to (20.2%).

Prevalence of indicators for assessment of picky eating based on researcher's criteria

Among 476 picky eaters reported by parents or caregivers, we asked given indicators within our criteria. The three main indicators with highest

prevalence were eating slowly; mealtime lasting for over 30 minutes (52.5%), holding food in the mouth (51.9%) and number of meals per day or amount of food was less than that of children at the same age (39.9%). The three highest prevalence of secondary indicators were eating snacks instead of meals (20%), eating sweets and fatty foods instead of healthy foods (10.3%) and refusing to eat fruit and vegetables (9.7%).

Onset time of picky eating

35.9% of picky eaters had signs at the period of complementary feeding and 35.5% from 1 to 2 years old. The prevalence decreased when the child getting older. 16.8% of them became picky eaters after getting diseases.

Age group of picky eaters

53.6% of picky eaters was under 3 years old (26.6% was 1 to under 2 years old). Age group of 5 accounted for 7.4%.

Number of meals per day

Prevalence of picky eaters who ate from 6 to 8 meals per day was higher than of nonpicky eaters

Mean of meals of picky eaters was higher than of nonpicky eaters significantly ($p < 0.001$) (see table 1).

Table 1. Number of meals per day

Number of meal per day	Picky eaters (researcher's criteria)		Nonpicky eaters		p value
	n	%	n	%	
2	1	0.4	5	0.6	0.9
3	16	6.6	132	15.4	0.0006
4	35	14.3	139	16.2	0.5
5	47	19.3	182	21.3	0.5559
6	135	55.3	377	44.0	0.0023
7	6	2.5	18	2.1	0.8976
8	4	1.6	3	0.4	0.1126
Total	244	100.0	856	100.0	
X\pmSD	5.36\pm1.06		5.00\pm1.18		<0.001

The most difficulty meal

11.3% of picky eaters had difficult eating in all of the meals and 4.9% had difficult at lunch while 38.9% nonpicky eaters had no difficult at mealtime and 12.6% had some difficult at lunch.

Nutritional status

7.2% of the childrens was underweight and 0.3% was severely underweight. Meanwhile 3.6% of the childrens was overweight. Considering length/height for age, prevalence of stunted and severely

stunted were 9.6% and 1.3%, respectively. 9.1% of the childrens was wasting and 7.4% of them was overweight according to BMI for age.

Relationship between picky eating and nutritional status

There was no relationship between picky eating and stunting ($p > 0.05$), economical status ($p > 0.05$) of the family but strong relationship between picky eating and underweight ($p < 0.001$), wasting ($p < 0.001$). Picky eaters were 4.02 times at risk of

underweight compared to non-picky eaters (95% CI: 2.54-6.36).

4. DISCUSSION

Picky eating and nutritional status of children

Picky eating

In this study, the prevalence of picky eaters perceived by parents or caregivers was 43.3%. The most common signs of picky eating were slowly eating, mealtime lasting for over 30 minutes (39.7%), eating less (31.7%), holding the food in mouth (23.5%), difficulty for feeding the child, just eating if he was forced to (20.2%).

Previous studies from other countries showed that picky eating were very common in children, ranging from 8 to 50% and was characterized by eating a limited amount of food, restricting intake particularly of vegetables, being unwilling to try new foods and having strong food preferences ^{(6) (8) (4) (7)}.

In Vietnam we did not have any former publication about the prevalence of the picky eating however, information from a Vietnamese website indicated that prevalence of picky eating of Vietnamese children was about 45.9 to 57.7% ⁽¹³⁾. Prevalence of picky eaters among children under 15 years old coming to nutrition center of Ho Chi Minh city, Vietnam was 65.5% according to parent’s perception ⁽¹⁴⁾. Our prevalence is statistical lower than that study (p<0.0001).

The result from our study also showed that parents or caregivers perceived their children as picky eaters two fold higher than criteria given by researcher (43.3% vs 22.2%). For some mothers, they perceived their children as picky eaters as soon as they only had 1 or 2 signs or just lasting for some days. This is not true because even the adults, if they feel sad or having some problems, they do not want to eat for some meals or some days but they are not picky eaters. We suggest that at least one month lasting for each indicator is suitable to some other researchers ^{(8) (9)}.

We considered a vicious cycle between picky

eating and long lasting mealtime. The time for each meal lasting too long, even one or two hours, the gap to the next meal was too short for the child to feel hungry then he would not want to eat... This is one thing to consider if we want to find reasons or solutions for intervention of picky eating.

Relating to the onset time of picky eating, 35.9% of picky eaters in our study had signs at the period of complementary feeding and 35.5% of them had picky eating from 1 to 2 years old. Compared to the prevalence of 32.4% in a study of Dao Thi Yen Phi in Ho Chi Minh city, Vietnam ⁽¹⁴⁾, the difference was not significant (p>0.05). The prevalence decreased when the child getting older. 16.8% of them become picky eaters after getting diseases.

Our study also showed that mean of meals of picky eaters was higher than of nonpicky eaters significantly (p<0.001), prevalence of picky eaters who ate from 6 to 8 meals per day was higher than of nonpicky eaters. Explanation for this is that most of picky eater ate snacks more frequently than nonpicky eaters and their parents tended to give them milk or junk food when they have signs of picky eating.

Nutritional status of children

In Vietnam, child malnutrition activities have been conducted in the last 30 years with various scales. Since 1998, it has become a project within the national health target program directly operated by the health sector in all communes nation-wide with the main objective as to reduce malnutrition, improve health status of children. Prevalence of underweight had significantly reduced from 51.5% in 1985 to 19.9% in 2008 and to 15.3% in 2013 ⁽¹⁵⁾.

Our results showed prevalence of underweight, severely underweight and overweight were 7.2%, 0.3%, 3.6%, respectively. Stunted and severely stunted accounted for 9.6% and 1.3%, respectively. This results were statistical lower than statistic from the Vietnamese National Institute of Nutrition (NIN) of children under 5 in Thua Thien Hue province in 2013 ⁽¹⁵⁾ (see table 2).

Table 2. Comparing nutritional status of children

Nutritional status	Our study (n=1100)	NIN (2013) (n=1531)	p value
	%	%	
Severely underweight	0.3	1.6	0.0025
Underweight	7.2	13.4	<0.0001
Overweight	3.6	4.5	0.2957
Severely stunting	1.3	8.5	<0.0001
Stunting	9.6	26.4	<0.0001

This study had showed an equation for picky eating defining and the cut –off point of 8.0 for defining picky eating.

The relationship between picky eating and nutritional status

We found the relationship between picky eating and underweight ($p < 0.001$), wasting ($p < 0.001$) but there was no relationship between picky eating and stunting ($p > 0.05$), economical status ($p > 0.05$) of the family. Picky eaters were 4.02 times at risk of underweight compared to non-picky eaters (95% CI: 2.54-6.36).

In a study on 34 children with picky eating

behavior who were referred to the Pediatric Feeding and Nutrition Clinic for evaluation and 136 healthy controls, Ekstein Sivan found that children with picky eating habits, especially those younger than 3 years of age, were at increased risk of being underweight⁽⁹⁾. There was evidence in early childhood that picky eaters weigh less than nonpicky eaters⁽¹⁶⁾.

5. CONCLUSION

Picky eating is common and a risk factor of underweight, wasting. It should be a big concern to public health workers. Further research on intervention or preventing picky eating is needed.

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