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## Research Article

# Assessing Nutritional Knowledge, Attitudes and Practices and Body Mass Index of Adolescent Residents of Orphanage Institutions in Selangor and Malacca

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## Abstract

**Background and Objective:** Orphaned children face an increased risk of being malnourished. This study was aimed to explore knowledge and attitudes towards nutrition as well as nutritional practices and Body Mass Index (BMI) of adolescent residents of orphanages. **Methodology:** Five orphanage institutions in Selangor and Malacca were chosen for this study and 85 adolescents aged 13-18 years old were enrolled. Questionnaires concerning nutritional knowledge were administered in face-to-face interviews to prevent bias and to ensure questionnaire completion. **Results:** The results showed that out of the 85 subjects, 80% were orphans and 20% non-orphans. The majority of respondents were of normal weight (61.2%), while 2.4 and 4.7% were thin and severely thin, respectively. Meanwhile, 16.5% of subjects were overweight and 15.3% were obese. Fewer than 20% of respondents (14/85) were scored as having a "good" level of nutritional knowledge score but more than half had nutrition attitude and practice scores within the "good" range. Although no significant correlation was found between nutrition knowledge and attitude ( $r_p = -0.043$ ,  $p = 0.694$ ) or knowledge and practice ( $r_p = -0.222$ ,  $p = 0.148$ ), there was significant correlation between nutrition attitude and practice ( $r_p = 0.295$ ,  $p = 0.006$ ). **Conclusion:** Less than half of the total respondents obtained a "good" score for nutritional knowledge but the majority of the participants scored at the "good" level for attitude and practice. Although most respondents scored at the "good" level for nutritional practice, this outcome was not reflective of the situation as a whole, particularly given the "poor" scores for exercise and breakfast practices.

**Key words:** Nutrition knowledge, attitude and practice, orphans, malnutrition, body mass index

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

UNICEF and its global partners estimated that in 2005 there were more than 132 million orphans living in sub-Saharan Africa, Asia, Latin America and the Caribbean<sup>1</sup>. Relative to non-orphans, orphans in Africa live in poorer households and are less likely to register for school. Moreover, when non-orphan children live in non-relative-owned-households, their situation worsens relative to children living with relatives<sup>2</sup>. In 2007, the World Health Organization (WHO) projected that 1 million children die every year due to severe acute malnutrition<sup>3</sup>.

Children living in orphanage institutions face increased risk of early malnutrition, impaired intellectual growth in their early years and loss of family attachment<sup>4</sup>. In addition, orphaned children are more frequently exposed to psychological stressors<sup>5</sup>.

Body Mass Index (BMI), is the ratio of individual's body weight (kg) to the square of the height (m)<sup>6</sup>. Based on a child's gender, age, height and stage of pubertal development, higher BMI values are associated with a greater tendency towards being overweight<sup>7</sup>. A study of children living in orphanages in Malawi found that 54.8% of the enrolled orphans were undernourished in terms of BMI<sup>8</sup>. Meanwhile, a study in Ghana showed that 10% of orphans were stunted ( $\leq -2$  z-score of height-for-age) and 15% were wasted ( $\leq -2$  z-score of BMI-for-age)<sup>9</sup>. These studies indicated that children living in typical institutions face a risk of inadequate holistic care that is needed for general development<sup>10</sup>. Nutrition is one of the important aspects of healthy development in childhood. The growth and immune-status of children can be compromised by inadequate nutrition that can also lead to recurrent and increasingly severe infectious diseases<sup>9</sup>. Orphans and other vulnerable children are more likely to be stunted and underweight compared to non-orphans and non-vulnerable children<sup>11</sup>. However, a study comparing nutritional indicators for orphans and non-orphans found few differences between these two groups, although both experienced extreme poverty<sup>12</sup>.

A high degree of nutritional knowledge is known to influence nutritional intake or practices<sup>13</sup>. Indeed, when the level of nutritional knowledge is low and attitudes are poor, individuals often display inappropriate dietary behavior as was found in a study of Ethiopian children that showed that orphans eat fewer fruits and vegetables and are less likely than non-orphans to eat breakfast<sup>14,15</sup>. Other studies also showed the significance of nutritional attitude in determining diet quality and for promoting good nutritional practices, which confirms the importance of accurate assessment of attitudes

towards nutrition<sup>16,17</sup>. Moreover, nutritional knowledge could be enhanced and nutrition practices encouraged by conducting education intervention programs<sup>18,19</sup>.

This study was aimed to explore nutritional knowledge, attitudes and practices as well as BMI values, among adolescents who resided in five orphanage institutions in Selangor and Malacca.

## MATERIALS AND METHODS

A cross-sectional survey was conducted among adolescents residing in five orphanage institutions from July 2014 until October 2014. A total of 85 adolescents aged between 13 and 18 years old were enrolled in this study.

**Respondents and study location:** All study participants resided in one of five orphanage institutions located in Sabak Bernam, Kuala Langat, Hulu Klang, Jasin and Bukit Katil in Malaysia. These institutions provide shelter to orphans and underprivileged children. To be eligible for this study, adolescents had to be between 13 and 18 years old and be free of physical and mental disabilities.

**Anthropometric measurements:** Weight and height were measured with a SECA body meter after participants had removed their shoes and socks. Body Mass Index (BMI) was calculated by dividing body weight (kg) by the square of the height (m). BMI category classifications were based on WHO<sup>3</sup> growth references for children aged 5-19 years.

**Questionnaire:** Nutritional knowledge, attitudes and practices of respondents were evaluated using a questionnaire administered in a face-to-face interview that avoided bias and ensured that all questions were answered according to the instructions. Questions were constructed based on reference books and journal articles and were checked and validated by panel of experts. A pilot study was conducted to ensure that the questions were appropriate for the targeted respondents. The questionnaire was written in the Malay language and included 11 questions related to nutritional knowledge, 6 questions on nutritional attitudes and 5 questions on nutritional practices. The knowledge domain consisted of multiple-choice items for: Nutrition definition (2 items), nutrition classification (1 item), food pyramid (2 items), nutrition source (2 items), nutrition function (2 items) and balanced foods and healthy eating (2 items). Each question had several response options and a 'Not Sure' option; one point was awarded for a correct answer and no points were

given for a wrong answer or a 'not sure' response. Only one question offered a "yes" or "no" answer. Regarding nutrition attitude response options, a 5-point Likert scale with 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree' was used. For the practice domain, higher scores were given to positive responses. The total scores for nutrition knowledge, attitude and practice were 40, 30 and 12, respectively.

Respondents who scored lower than 70% of the total score for the knowledge, attitude and practice domains were placed in the "poor" category, while those scoring higher than 70% were categorized as "good".

**Data analysis:** IBM SPSS Statistics 21 software was used for data analysis. The demographic profiles were presented descriptively.

Scores for knowledge, attitude and practice were obtained by summing all scores for each variable. Pearson correlation analysis was used to determine the relationship between nutritional knowledge, attitude and practice.

## RESULTS

This study was included 85 participants who were aged 13-18 years and resided in one of five orphanages in Malaysia.

The majority was between 13 and 14 years of age and 80% were orphans with the remainder being non-orphans (Table 1). Most of the participants had lived in the institution between 1 and 24 months and thus were considered to be newcomers. The majority of study subjects had a normal BMI, while 4 were severely thin and 2 were thin. Meanwhile, 14 subjects were overweight and 13 were obese (Table 1).

The mean (between 50th and 75th percentile) nutritional knowledge, attitude and practice scores were:  $21.7 \pm 6.0$  (between 50th and 75th percentile),  $21.7 \pm 2.9$  (between 50th and 75th percentile) and  $8.1 \pm 2.2$  for practice, respectively (Table 2). Most respondents scored as "poor" on knowledge of nutrition but received "good" scores for attitude and practice (Table 3). However, there was no correlation between knowledge and attitude or knowledge and practice (Table 4).

Several questions regarding nutritional practice had different response options. For example, the question, "How many times do you eat daily?" gave a "good" result when the majority (88.2%) chose the optional answer "Eat three times or more per day". For the question "How many times do you have breakfast in a week?" most respondents (67.1%) showed "poor" habits as indicated by the response that they skipped breakfast at least one day per week. Regarding nutritional practice, participants were asked about fast food

Table 1: Characteristics of the study sample (n = 85)

Variables	Number of respondents (n)	Percentage
<b>Age group</b>		
13-14	47	55.3
15-16	31	36.5
17-18	7	8.2
<b>Parental status</b>		
Orphan	68	80.0
Non-orphan	17	20.0
<b>Length of orphanage stay (months)</b>		
1-24	46	54.1
25-48	25	29.4
49-72	11	12.9
73-96	3	3.5
<b>Body mass index</b>		
Severely thin	4	4.7
Thin	2	2.4
Normal	52	61.2
Overweight	14	16.5
Obesity	13	15.3

Table 2: Summary of respondents nutritional knowledge, attitude and practice scores (n = 85)

Questionnaire	Total score	Minimum score	Maximum score	Mean (SD)
Knowledge scores	40	6	36	21.7 (6.0)
Attitude scores	30	14	28	21.7 (2.9)
Practice scores	12	3	12	8.1 (2.2)

Table 3: Category of knowledge, attitude and practice (n = 85)

Knowledge		Attitude		Practice	
Good	Poor	Good	Poor	Good	Poor
14 (16.5)	71 (83.5)	57 (67.1)	28 (32.9)	53 (62.4)	32 (37.6)

Data are presented as n (%)

Table 4: Correlation between nutritional knowledge, attitude and practice (n = 85)

Parameters	Knowledge		Attitude		Practice	
	Respondents	p-value	Respondents	p-value	Respondents	p-value
Knowledge	-	-	-0.043	0.694	-0.222	0.148
Attitude	-0.043	0.694	-	-	0.295	0.006
Practice	-0.222	0.148	0.295	0.006	-	-

consumption, wherein 52.9% reported that they seldom ate that type of food. Mostly the respondents (47.1%) also seldom drank sweetened or carbonated drink beverages on a weekly basis.

## DISCUSSION

In this study the majority of respondents were within normal BMI ranges, which is consistent with findings of similar study conducted in a welfare home in Kuala Lumpur<sup>20</sup>. Furthermore, a study of BMI in female children showed the same trend wherein most children were of normal weight<sup>21</sup>. For those children outside of the normal range, a previous study conducted using a correlation tool that used BMI as a variable found that for those children who had abnormal BMI values, the percentage of overweight and obese children was higher than that for children who were underweight<sup>22</sup>.

Although the mean nutritional knowledge of the respondents was at the moderate level (between 50th and 75th percentile), this value was barely above the 50th percentile, which indicated that the overall level was poor. As for the category score, very few respondents achieved a "good" knowledge score. This result is in agreement with previous measurements of nutritional knowledge of high school adolescents that showed overall poor nutritional knowledge<sup>23</sup>. However, knowledge levels could be improved after appropriate interventions<sup>24</sup>.

This study indicated that for nutritional attitudes, most respondents were in the "good" category. This result is encouraging given that a study in the Netherlands showed that nutritional attitude was identified as a significant correlate of healthy eating practices<sup>25</sup>. Moreover, 57.7% (49) of participants disagreed with the statement: "In my opinion, my dietary pattern cannot be improved". This result indicated that dietary patterns can likely be improved as was suggested by a longitudinal study conducted in the United Kingdom that showed nutritional awareness is among the important factors

that drive dietary change<sup>26</sup>. Thus, awareness of the importance of having good nutrition can promote changes in nutritional attitudes.

Results from this study showed that a significant percentage (67.1%) of respondents often did not eat breakfast. This finding is a concern given that skipping breakfast is associated with weight problems that could arise from ensuing decreased physical activity<sup>27</sup>. The lack of breakfast may also have contributed to the number of overweight and obese (14 and 13, respectively) respondents in this study. This line of thinking is supported by a systematic review of studies on the effects of breakfast on cognitive performance among well-nourished and nutritionally at-risk or stunted children, which found that a positive effect of breakfast on cognitive performance was seen in both short and long-term studies<sup>28</sup>. Skipping breakfast is not recommended because it is highly associated with weight problems in children and adolescents, who may be less likely to engage in physical activity that in turn promotes weight gain<sup>27</sup>. In addition, high BMI values were significantly associated with this unhealthy routine<sup>29</sup>. The majority of respondents in this study consumed three meals daily, which is consistent with an earlier study of Malaysian children that found that most respondents ate breakfast, lunch and dinner<sup>30</sup>. In addition, the institutions targeted in this study provided five mealtimes daily.

This study found that there was significant positive correlation between nutritional attitudes and practices. This result is in accordance with an earlier finding that positive attitude is significantly related to healthy eating practices<sup>31,32</sup>.

## CONCLUSION

It can be concluded that less than half of the total respondents obtained a "good" score for nutritional knowledge. Thus, more effort is needed to provide and enhance nutritional knowledge among underprivileged youth.

The majority of respondents achieved a “good” nutritional attitude score. Although most respondents scored at the “good” level for nutritional practice, this outcome was not reflective of the situation as a whole, particularly given the “poor” scores for exercise and breakfast practices. The infrequency of breakfast consumption indicates that good breakfast habits should be promoted in order to promote nutritional health.

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