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Mothers' Nutritional Knowledge, Self-efficacy, and Practice of Meal Preparation for School-age Children in Yangon, Myanmar

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Mothers' Nutritional Knowledge, Self-efficacy, and Practice of Meal Preparation for School-age Children in Yangon, Myanmar

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Abstract

Background: Childhood malnutrition is a global public health concern. For Myanmar, mothers play a prominent role in improving the nutritional status of children as they prepare meals for children.

Methods: This community-based cross-sectional analytical study was conducted on 367 mother-child pairs (6–10 years). Significantly, systematic random sampling and structured questionnaires were utilized in this study.

Results: The mean age of mothers was 35.73 ± 6.9 years, and a majority had fair nutritional knowledge (52.3%), good self-efficacy (79.8%), and good practice of meal preparation (59.4%). The prevalence of childhood malnutrition was categorized as stunting (18.2%), underweight (18.8%), wasting (13.3%), overweight (9.0%), and obesity (6.5%). Only 34.2% of children were in the normal nutritional status. The nutritional knowledge of mothers was associated with the age and education of mothers, child ownership, monthly food budget, and height-for-age ($p < 0.05$). Mothers' self-efficacy was associated with education, child ownership, monthly food budget, height-for-age, and weight-for-age ($p < 0.05$). The meal preparation practice of mothers was associated with their education, child ownership, monthly food budget, height-for-age, and BMI-for-age ($p < 0.05$). Nutritional knowledge, self-efficacy, and meal preparation practice of mothers were strongly correlated with each other ($p < 0.001$). BMI-for-age was associated with mothers' education ($p < 0.05$).

Conclusions: This study suggests improving the nutritional aspects of mothers by providing nutrition education combined with self-efficacy improving activities. This activity will lead to maintaining good nutrition in school-aged children.

Keywords: child, malnutrition, meal preparation, mothers, nutritional status, self-efficacy

INTRODUCTION

The UN Sustainable Development Goals could be accomplished by facilitating good nutrition for every human being and working together in many sectors from different aspects.[1] More than 340 million children aged 5–19 years globally suffered from overnutrition, which was increased thrice from 1975 to 2016. Three-fourths of stunting among children aged 5–19 years was found in the Southeast Asia Region.[2] Myanmar Micronutrients and Food Consumption Survey (2017–2018) reported the nutritional status of children aged 5–9 years with parameters such as stunting (22.1%), wasting (14.6%) and overweight (3.3%). Childhood stunting, wasting, and overweight among children aged 5–9 years in the Yangon region were 16.2%, 18.1%, and 5.7%, respectively.[3]

Parents are keys for succeeding in making the dietary practice of children healthy and keeping the healthy body weight among children as the parents serve meals for their children during (and later) the childhood period.[4] In Myanmar, school-age children are under parents' guardianship, and the parents' choices influence their children's food consumption. A previous local study suggested the implementation of awareness-raising activities for parents about the unfavorable health status in children, which resulted from unhealthy food consumption.[5] A different local study showed that the mothers' knowledge and attitude had no relationship with the children's BMI.[6] In a study conducted in Brazil, guardians' meal-serving practice correlated with the BMI-for-age of children.[7] Therefore, this study aims to provide clarity on these inconsistent findings on the relationships between the mothers' the nutritional aspects and the children's nutritional status.

Less knowledgeable mothers in a country in Central North Carolina were more likely to serve less healthy foods to children, further making it difficult to control the weight status in children.[8] Additionally, childhood malnutrition will occur if mothers do not have good nutritional knowledge and do not feed children properly, even though they improve household income, sufficient dietary intake, effective hygiene, and adequate health care.[9] The higher self-efficacy of parents was crucial to shift the meal preparation practice of young children, which contributed to childhood obesity to healthy ones.[10]

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A study in South Okkalapa, Thanlyin, Insein, and Kyauktada Townships reported the prevalent conditions of being underweight (4.9%), overweight (10.0%), and obese (4.9%) among students.[11] Studies conducted in the Thanlyin Township had a school-based setting. A study in Sri Lanka reported primary school-aged children were most commonly found to have single or concurrent undernutrition.[12] To the best of our knowledge, previous studies had identified the relationship between the nutritional aspects of mothers; however, the studies on mothers' self-efficacy and the children's nutritional status were still limited, particularly in Myanmar. Additionally, school-age children who are 6–10 years old and out-of-school children are not under investigation. These populations spend more time with family, and there is a need to determine mother-related factors on the children's nutrition. Therefore, the mothers of school-age children in the community were chosen as the study population in this study because these mothers prepare meals for primary school-age children. The purpose of this study is to investigate the nutritional knowledge, self-efficacy, and meal preparation practice of the mothers for school-age children and the nutritional status of the children.

Our first four specific objectives are: to describe sociodemographic characteristics of mothers; to assess demographic characteristics and levels of the nutritional status of children; to identify the nutritional aspects of mothers; and to determine the associations between sociodemographic characteristics of mothers and nutritional aspects of mothers. The last four objectives were: to determine the associations between sociodemographic characteristics of mothers and nutritional status of children; to determine the associations between demographic characteristics of children and nutritional status of children; to determine the associations between the nutritional aspects of mothers; and to determine the associations between the nutritional aspects of mothers and the nutritional status of children.

METHODS

This study was conducted according to the guidelines issued by the Ethics and Research Committee of the University of Nursing, Yangon, and received a permit from the local authority. The individuals were invited to participate in the research, and the participation was voluntary. The informed consent of participants was taken after a thorough explanation of the nature, purposes, procedure, duration, benefits, and risks of the study. The individuals were free to refuse participation and withdraw from the study before data entry without any penalty or loss of benefits to which the mother would otherwise be entitled.

A community-based cross-sectional analytical study design was used to investigate the nutritional knowledge, self-efficacy, and meal preparation practice of the mothers and the nutritional status of the children in the Thanlyin Township, Yangon Region from November 2019 to October 2020. Sampling and data collection took two months (late June to mid-August) to complete.

Mothers aged ≥18 years, had at least one school-age child (6–10 years), who dwelled in the same house with children, and used to prepare meals were included in this study. In addition, each mother with one school-age child was included. Mothers and their children who were psychosocially disabled or severely ill and mothers in the late trimester of gestation were excluded from this study.

The mother-child pairs (n = 367) were recruited with systematic random sampling after seeking and listing the households with children aged 6–10 years in 3 wards in the Thanlyin Township via home visits with local authoritative persons and ward in-charge midwives. According to the demographic distribution, the respondent mothers were selected from the Bagosu ward (30%), Oak Pho Su ward (40%), and Aung Chan Thar ward (30%) proportionately.

The research instruments included four main sections: sociodemographic characteristics, nutrition knowledge, self-efficacy, and meal preparation practice. The sociodemographic characteristics included mothers' age (completed years), education, occupation, number of children, schooling of children, adequacy of monthly food budget, and lifestyle practices (smoking, betel chewing, and alcohol drinking). The participants took 20–30 minutes to respond to the self-administered questionnaires. Additionally, the demographic characteristics of children, such as age (completed years and months) and gender, including on-spot anthropometric measurements, were also documented.

The validated structured questionnaire "The dietary questionnaire on food habits, eating behavior and nutritional knowledge" from a previous study[13] was modified with the permission of questionnaire developers for it to be relevant to the local condition. It was then categorized into three main sections: nutritional knowledge, self-efficacy, and meal preparation practice of mothers. In total, 68 questionnaires contained 5 question sets regarding nutritional knowledge: basic food knowledge (22 items); food safety knowledge (10 items); self-efficacy (15 items); meal preparation practice: food choice and cooking practice (10 items); and hygienic food practice (11 items). After the pre-test among 30 mothers in the Tharketa Township, the questionnaire was reviewed and revised to enhance a clear understanding of mothers on the questionnaire.

Each item for all knowledge questionnaires contained "Yes," "No," and "Don't know" responses. The score for "Yes" in the healthy statement was "1," and for "No" and "Don't know" was "0." In the unhealthy statement, the score for "No" was "1," and for "Yes" and "Don't know" was "0." Each item for self-efficacy questions comprised four-point Likert scale, and the score for "Fully confident" was "3," for "Fairly confident" was "2," for "Slightly confident" was "1," and for "Not confident at all" was "0." Each item for all practice questions comprised a five-point rating scale (always, usually, often, sometimes, and never). The score for "Always" in a healthy statement was "4" and for an unhealthy practice was "0." Healthy and unhealthy practices were scored as 0, 1, 2, 3, 4 and 4, 3, 2, 1, 0, respectively.

The levels of nutritional knowledge and meal preparation practice of mothers were categorized into poor (≤ 50.0%), fair (51.0% – 75.0%), and good (≥ 76.0%), according to a previous study.[14] Furthermore, the scores for self-efficacy of mothers were categorized as incapacity (≤ 33.3%), sufficient capacity (33.4%–66.6%), and good capacity (≥ 66.7) to improve the nutritional status of children, according to a previous study.[13]

For anthropometric measurements, the standardized weight and height machine (ZT-160 brand) was used to take the weight and height of respondent's school-age child. To ensure that weight measurements were accurate, the weight machine scale was calibrated in a place before taking children's weight. The weight was recorded to the nearest 0.1 kilogram. The height was accurately recorded to the nearest 0.1 centimeter. BMI was calculated by dividing weight in kilogram by the square of height in meter.

WHO Growth Reference for children aged 5–19 years[15] was used to determine the nutritional status using nutrition indices: weight-for-age, height-for-age, and BMI-for-age. As shown in Table 1, the *Z*-score out of these unhealthy height-for-age, weight-for-age, and BMI-for-age was considered as normal.

TABLE 1. WHO classification of nutrition condition in children and adolescents based on anthropometry

Z-score cut-off points	Height-for-age	Weight-for-age	BMI-for-age
<-2SD to -3SD	Stunted	Underweight	Wasted
<-3SD	Severely stunted	Severely underweight	Severely wasted
>+1SD			Overweight
>+2SD			Obese

Descriptive findings were presented as mean and standard deviation for continuous data or number (proportion) for categorical data. When data were not normally distributed, non-parametric tests were used for inferential statistics. Mann–Whitney *U* test was used to identify the associations of the mothers' sociodemographic characteristics with their nutritional knowledge, self-efficacy, and meal preparation practice. It also was used to identify associations among these three domains of mothers' nutritional aspects with the nutritional status of children. Chi-square test and Fisher's Exact test were used to examine the associations between sociodemographic characteristics of mothers and the nutritional status of children, and between the demographic characteristics of children and the nutritional status of children. Moreover, the Spearman correlation test was used to find out the associations among nutritional knowledge, self-efficacy, and meal preparation practice of mothers. *p* less than 0.05 was considered as statistically significant for this study. The statistical data were analyzed by using the Statistical Package for Social Science, version 18.0.

RESULTS

The content validity of the employed questionnaires was between 0.8 and 1.0, and the content validity for scale was between 0.85 and 1.0. The values of Cronbach's alpha for nutritional knowledge, self-efficacy, and meal preparation practice were 0.752, 0.779, and 0.715 respectively. The overall questionnaire had preferable reliability (Cronbach's alpha = 0.862).

Sociodemographic characteristics of mothers

In this study, the mean age of mothers was 35.7 ± 6.9 years. A majority of them were aged 30 years, as shown in Table 2. The youngest mother was 21 years old, and the oldest was 54 years old. Based on the self-reported data of mothers' lifestyle practice, most mothers did not practice smoking, betel chewing, and alcohol drinking. Only 30 mothers chewed betel; however, they did not smoke and drink alcohol.

Demographic characteristics and the nutritional status of children

A majority of children were more than 8 years old and 52.6% were boys. The prevalence of undernutrition was categorized into stunting (14.7%), severe stunting (3.5%), underweight (13.4%), severe underweight (5.4%), wasting (6.5%), and severe wasting (6.8%). Childhood overnutrition was categorized as overweight (9.0%) and obesity (6.5%). As shown in Table 3, 34.2% of children were in the normal nutritional status; whereas the rest were malnourished ranging from one, two to three types of malnutrition. Stunting (12.0%) had the highest prevalence in single malnutrition. Among concurrent malnutrition, stunting plus underweight had the highest prevalence and was experienced by 18.5% of children.

Stunting was more prevalent among children aged older than 8 years (19.5%) than children aged ≤ 8 years (16.9%).

Underweight was a more common category among children aged 8 years or older (22.1%) than children aged ≤ 8 years (15.3%). Wasting and overweight were more common among 15.2% and 10.5% of children aged more than 8 years, respectively, whereas obesity was among children aged ≤ 8 years (7.9%). Stunting was more common among boys (22.8%) than girls (13.2%). The condition of being underweight was found among boys (22.3%) and girls (14.9%). Wasting and overweight were more commonly found among boys (14.5% and 13.5%, respectively), whereas obesity was found among girls (7.5%).

Nutritional knowledge, self-efficacy, and meal preparation practice of mothers

As shown in Table 4, most mothers had fair basic food knowledge, fair food safety knowledge, and fair nutritional knowledge. Regarding self-efficacy, most mothers were in the good capacity to improve children's nutrition. As for food choice and cooking practice, most mothers had a fair food choice and cooking practice, good food hygienic practice, and good meal preparation practice.

TABLE 2. Sociodemographic characteristics of mothers (N = 367)

Variables	Number of respondents	Percentage (%)
Age (Years old)		
≤ 25	73	19.9
26 – 35	194	52.9
36 – 45	88	23.9
≥ 46	12	3.3
Educational status		
Illiterate and literate	53	14.4
Primary school	82	22.3
Middle school	126	34.3
High school	64	17.5
University and above	42	11.5
Occupational status		
Housewife	221	60.2
Daily wager	97	26.4
Government staff	16	4.4
Private staff	10	2.7
Business owner	23	6.3
Child ownership of mothers		
One child	74	20.2
Two children	152	41.4
Three children	69	18.8
More than three children	72	19.6
Schooling of children		
School going	355	96.7
Out-of-school	12	3.3
Usage condition of monthly food budget		
Adequacy	165	45.0
Inadequacy	202	55.0
Lifestyle practice		
Healthy practice	337	91.8
Unhealthy practice	30	8.2

TABLE 3. Nutritional status of children (N = 367)

Variables	Number of respondents	Percentage (%)
Normal	126	34.2
Stunting only	44	12.0
Underweight only	4	1.1
Wasting only	24	6.5
Overweight only	15	4.1
Obesity only	1	0.3
Stunting + underweight	68	18.5
Stunting + underweight + wasting	45	12.3
Stunting + overweight	5	1.4
Stunting + obesity	1	0.3
Underweight + wasting	34	9.3

TABLE 4. Nutritional knowledge, self-efficacy, and meal preparation practice of mothers

Knowledge, self-efficacy, and practice of mothers	Number of respondents	Percentage (%)
Basic food knowledge		
Poor	41	11.2
Fair	201	54.8
Good	125	34.0
Food safety knowledge		
Poor	51	13.9
Fair	279	76.0
Good	37	10.1
Nutritional knowledge		
Poor	33	9.0
Fair	192	52.3
Good	142	38.7
Self-efficacy		
Incapacity	0	0
Sufficient capacity	74	20.2
Good capacity	293	79.8
Food choice and cooking practice		
Poor	49	13.4
Fair	218	59.4
Good	100	27.2
Food hygienic practice		
Poor	11	3.0
Fair	77	21.0
Good	279	76.0
Meal preparation practice		
Poor	14	3.8
Fair	134	36.5
Good	219	59.7

Associations between mothers' sociodemographic characteristics and their nutritional knowledge, self-efficacy, and meal preparation practice

As shown in Table 5, the age of mothers was significantly associated with the nutritional knowledge of mothers (p = 0.008), not with self-efficacy and meal preparation practice. The educational status of mothers was strongly associated with the nutritional knowledge, self-efficacy, and meal preparation practice of mothers. Moreover, the occupational status of mothers had no relationship with the self-efficacy and meal preparation practice of

mothers. The child ownership of mothers had statistical associations with nutritional knowledge, self-efficacy, and meal preparation practice of mothers. The usage condition of monthly food budget had strong associations with nutritional knowledge, and was associated with the mothers' self-efficacy and meal preparation practice.

Associations between mothers' sociodemographic characteristics and children's nutritional status

The BMI-for-age of children had significant associations with the educational status of mothers (p = 0.004). The BMI-for-age of children was not associated with the age of mothers (p = 0.745), occupation (p = 0.092), child ownership (p = 0.519), schooling of children (p = 0.521), and the usage condition of monthly food budget (p = 0.397).

Associations among nutritional knowledge, self-efficacy, and meal preparation practice of mothers

The nutritional knowledge of mothers was positively and strongly associated with self-efficacy (p < 0.001) and meal preparation practice (p < 0.001). Additionally, there was a positive strong association between the self-efficacy and meal preparation practice of mothers (p < 0.001).

Associations between mothers' nutritional knowledge, self-efficacy, and meal preparation practice and children's nutritional status

As shown in Table 6, the height-for-age of children was significantly associated with the nutritional knowledge, self-efficacy, and meal preparation practice of mothers. The weight-for-age of children was strongly associated with the self-efficacy of mothers, but not with nutritional knowledge and meal preparation practice of mothers. The BMI-for-age of children was significantly associated only with the meal preparation practice of mothers, but not with nutritional knowledge and self-efficacy.

TABLE 5. Associations between sociodemographic characteristics of mothers and nutritional aspects of mothers

Nutritional aspects of mothers	Sociodemographic characteristics of mothers	*p*
Nutritional knowledge	Age	0.008
	Education	0.000
	Child ownership of mothers	0.026
	Usage condition of monthly food budget	0.002
Self-efficacy	Age	0.513
	Education	0.002
	Occupation	0.144
	Child ownership of mothers	0.031
	Usage condition of monthly food budget	0.000
Meal preparation practice	Age	0.160
	Education	0.004
	Occupation	0.712
	Child ownership of mothers	0.011
	Usage condition of monthly food budget	0.000

TABLE 6. Associations between nutritional aspects of mothers and nutritional status of children

Nutritional aspects of mothers	Nutritional status of children	*p*
Nutritional knowledge	Height-for-age	0.023
	Weight-for-age	0.354
	BMI-for-age	0.095
Self-efficacy	Height-for-age	0.023
	Weight-for-age	0.005
	BMI-for-age	0.766
Meal preparation practice	Height-for-age	0.006
	Weight-for-age	0.070
	BMI-for-age	0.020

DISCUSSION

The caring practice of mothers, particularly meal preparation practice, was essential for the good nutritional status of children from birth through childhood to adolescents. The children aged 6–10 years were a part of the middle childhood; importantly, malnutrition was found among this population. This study was similar to a previous study[6] conducted in women aged 26–35 years. In this study, 72.8% of mothers delivered their first child on the age ≤ 25 years. This may be a reason for the presence of childhood malnutrition in this study. Previous studies also supported this fact where mothers who delivered child at her age of < 20 years had a higher likelihood to have stunted children[16] and undernourished children.[17]

This study showed a higher prevalence of childhood stunting, underweight, wasting, and overnutrition than the study conducted in Nigeria.[18] The high prevalence of being underweight in children as the outlook of the nutritional condition of the school-age children in this study pointed out the need for paying attention to that population.[18] It needs to consider hand washing practice before having meals[19] and dietary diversity[20] for managing the problem of underweight in childhood.

In this study, over half of the mothers had full confidence to reduce the influences of friends and family members on choosing a diet for their children. This study aligned with the report about food preferences of relatives in the same house as a factor restricting the ability of mothers to practice a healthy lifestyle.[14,21] The attitude of mothers toward the importance of family support[14] was more likely to increase the influence of relatives and colleges on the practice of mothers. Moreover, public health staff should take anthropometric measurements of school-age children to identify the occurrence of childhood malnutrition; the documentation of these nutritional status should be kept in the health information management system to collect evidence for nutrition-related studies and programs as well as to recognize the changes in the malnutrition prevalence or improvement of treatment for malnutrition.

The associations between mothers' nutritional aspects and sociodemographic characteristics

This study showed the presence of an association between the nutritional knowledge of mothers and the education of mothers.[6,14,22] This observation could be explained by higher chances of getting knowledge from various sources of information accessible by educated mothers, particularly internet sources.

This study described that the educational status of mothers was associated with the self-efficacy and meal preparation practice of mothers. A study in Indonesia supported that fact by suggesting nursing professionals to raise the mothers' sense of confidence in providing healthful meals so that the nutritional status of children could be improved.[23] This study concurred with a study in Nepal on the presence of association of nutritional status with the practice of mothers.[14] Self-efficacy and the meal preparation practice of mothers were associated with the child ownership of mothers in this study. This could be explained by differences in the frequency of antenatal visits, nutrition education for breastfeeding, complementary feeding, and young child feeding. Service-learning in taking care of the first child made mothers feasible for taking care of the next child, and practice-based knowledge increased one child by child.

The association between the usage condition of the monthly food budget and the self-efficacy and practice of mothers in this study could be explained with affordability and accessibility to consume and feed healthy foods, which might affect mothers' self-efficacy to improve the nutritional status of children in this study. The poverty cycle largely affected the nutritional status of children. When the children could not adequately be fed to meet the nutrition needs, the children became acutely malnourished. This observation was in line with the fact that the expensiveness of healthful foods limits mothers' food choices.[14] Therefore, family income and/or monthly food budget were required to consider the nutrition-promoting activities.[24] It should not be underconscious about the poverty cycle, and poverty-relieving actions may be required later.

The associations between children's nutritional status and sociodemographic characteristics

The education of mothers associated with BMI-for-age of children, which was congruent with previous studies.[25–28] Concerning overnutrition, the presence of association may be attributed to the fact that educated mothers seemed to be less recognizable about the increased weight status of their children[29] or had the attitude that "bulgy cheeks were features of good health condition."[30] The occurrence of unhealthy BMI could be addressed by reinforcing educated mothers to determine the body shape of their children based on anthropometric measurements.

The nutritional status of children was not found to be associated with mothers' occupational status and usage condition of monthly food budget in this study. This study was in line with the local study[31] that showed no association between occupation and childhood overnutrition. This study did not correspond with the study in Nigeria[32] that showed an association between income status and nutritional status.

This study was in line with studies in Egpyt[33] and Ethiopia,[27] which reported that the prevalence of undernutrition increased with age. This could be explained that older children could buy their favorite low-quality foods affected by nutrition transition, contributing to the nutritional status of these unhealthy children.

Regarding descriptive findings, stunting, underweight, and wasting conditions were more prevalent in boys, which was congruent with a previous study in Nepal.[26] As for stunting and underweight, this study did not correspond with a higher prevalence in girls[34] and no gender difference.[35] This study agreed with reports on the presence of an association between the gender of children and BMI-for-age of children.[7,36,37] Possible reasons for gender difference in this study were the amount of physical activity[37] and the practice of hand washing before eating meals,[19] hormonal changes in girls just before menarche,[38,39] and the interrelation between

undernourishment and parasitic infections, leading to stunting.[28]

The associations among nutritional aspects of mothers

In this study, the nutritional knowledge of mothers strongly correlated with the self-efficacy and meal preparation practice of mothers. If mothers had adequate nutritional knowledge, then mothers' self-efficacy will rise because every mother wanted to keep their children in good nutritional status and health condition. Providing sufficient nutritional knowledge to mothers and increased accessibility to healthy foods in the community with affordable prices facilitated these mothers to adopt a healthy meal preparation practice automatically. Accepting the report,[40] the guardianship of knowledgeable parents might largely influence children's food consumption by providing accessibility to healthful foods at home and by directing children to make healthy food choices outside of home.

The mothers' self-efficacy had a strong relationship with the meal preparation practice of mothers in this study, which concurred with previous studies.[14,23,41] Only nutritional knowledge could not completely change the practice of the mother. This study was correspondent with previous literature[42] on assuming self-efficacy as a mediator in transition from nutritional knowledge to the adoption of healthy practice.

The associations between children' nutritional status and mothers' nutritional aspects

That fact supported the absence of association of the nutritional knowledge of mothers with weight-for-age and BMI-for-age of children in this study, which concurred with a study[6] on BMI-for-age. Among middle school children in Naypyidaw, 56.3% bought the unhealthy colorful snacks at the shops near home.[43] Therefore, this study agreed with the study,[44] which reported children aged ≤ 8 years should be recruited in school interventions. It needed to provide high-quality foods in the reach of children, and parents needed to buy and keep healthy snacks ready for children to eat at home. Responsible persons should develop a healthy food environment and improve food security. Contrariwise, basic health staffs need to provide nutrition education while emphasizing locally available foods and improving ability to make healthy food choice in the condition of inadequate monthly food budget.

The nutritional knowledge and meal preparation practice of mothers were significantly associated with height-for-age of children. This study was in line with the presence of association with nutritional knowledge,[9] and the fact the meal-serving practice of mothers shaped the nutritional status of children.[22] Because stunting is long-term undernourishment during the gestational period and early childhood, proper feeding and the meal-serving practice of mothers during these periods could reduce the stunting vulnerability in middle childhood.[27]

There was no association between the nutritional knowledge of mothers and weight-for-age and BMI-for-age of children in this study. With the increasing age, the guardianship of mothers did not fully cover the dietary intake of their children, also reported in a previous study in Indonesia.[45] Another possible reason was an inadequate dietary intake of children; however, knowledgeable mothers prepared a well-balanced diet. Therefore, it needed to involve both mothers and children in nutrition education about the importance of a well-balanced diet on nutritional health to improve children's dietary intake and make healthy food choices by children when they grew up. This fact was supported by a previous Japan study[46] where the nutritional knowledge of children and guardians correlated with children's dietary intake.

In this study, the self-efficacy of mothers had significant relationships with height-for-age and weight-for-age of children. If mothers overcame the effects of relatives in making food choices, mothers could make healthy food choices based on their existing nutritional knowledge. This study found only sufficient and good capacity to improve the nutritional status of children. In the case of the presence of high self-efficacy in mothers, the socioeconomic status and health status of these children needed to be considered in determining the causes of childhood malnutrition. This study found a significant relationship between meal preparation practice of mothers and BMI-for-age of children, which was correspondent with a previous Brazil study.[7] The meal preparation with good knowledge was more likely to provide more healthful meals.

There were some limitations in this study. At first, questionnaires were close-ended; therefore, it could limit answering questions frankly. Second, this study observed self-efficacy and meal preparation practice with only self-reported data. However, the respondent mothers were asked to respond to their reality through informing the presence of confidentiality. Third, only association between observed variables was identified in this study because this study was a cross-sectional study. Therefore, it would be advisable to determine the causes and effects between these variables with longitudinal study design in future studies. In addition, the data in this study were reported only from one area population group; therefore, it might not be fully representative of the nationwide population.

Children should be included in nutrition education to enhance healthy food choices themselves when they grow older. Further studies should be conducted to identify associating factors, influencing factors, and risk factors to understand the nutritional status of school-age

children fully. Providing nutrition education focused on consuming locally available foods, making the mothers understand food quality by comparing healthy foods and unhealthy foods, and empowering them to make healthy food choices efficiently with the monthly food budget are encouraged. Moreover, the accessibility to healthy foods at an affordable price should be improved. It would be advisable to include taking anthropometric measurements in school health services so that the nutritional status and its trends are recognized and nutrition interventions are implemented in time. Combining nutrition education and self-efficacy improving activity may lead someone to change behavior because self-efficacy is key to achieve the predetermined goals through overcoming barriers.

CONCLUSIONS

All kinds of malnutrition and concurrent malnutrition were found among children aged 6–10 years in three wards of the Thanlyin Township. This study concluded that mothers' nutritional knowledge, self-efficacy, and meal preparation practice were improved and maintained at a good level to prevent childhood malnutrition and achieve optimal nutrition.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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