

# Factors Associated with Maternal Behavior in Prevention of the Hand, Foot and Mouth Disease in Young Children, Vietnam

นิพนธ์ฉบับ

Original Article

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## บทคัดย่อ

**วัตถุประสงค์:** เพื่อศึกษาพฤติกรรมกรรมการป้องกันโรคมือเท้าปาก และความสัมพันธ์ระหว่างพฤติกรรมของมารดาในการป้องกันโรคมือเท้าปากในบุตรวัยเด็กเล็กกับความรู้อยู่เกี่ยวกับโรคมือเท้าปาก สมรรถนะตนเอง และการสนับสนุนทางสังคม **วิธีการศึกษา:** ใช้การสุ่มแบบแบ่งกลุ่มในการคัดเลือกกลุ่มตัวอย่าง 97 ราย ซึ่งเป็นมารดาของเด็กเล็กที่นำบุตรมารับบริการที่ศูนย์เลี้ยงดูเด็ก ในเมืองไฮ่เซือง ประเทศเวียดนามรวบรวมข้อมูลระหว่างเดือนสิงหาคมถึงกันยายน พ.ศ. 2558 ใช้แบบสอบถามให้ตัวอย่างตนเอง ประกอบด้วย 1-แบบสอบถามข้อมูลทั่วไป 2-แบบสอบถามพฤติกรรมกรรมการป้องกันโรคมือเท้าปาก 3-แบบสอบถามความรู้โรคมือเท้าปาก 4-แบบสอบถามสมรรถนะตนเองของมารดา และ 5-แบบสอบถามการสนับสนุนทางสังคม แบบสอบถาม 2-5 มีสัมประสิทธิ์อัลฟาของครอนบาคเท่ากับ 0.81, 0.81, 0.85 และ 0.86 ตามลำดับวิเคราะห์ข้อมูลโดยใช้สถิติพรรณนาและสัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน **ผลการศึกษา:** ค่าเฉลี่ยพฤติกรรมกรรมการป้องกันโรคมือเท้าปากในบุตรวัยเด็กเล็กของมารดาชาวเวียดนามเท่ากับ 73.81(S.D. = 8.70)ซึ่งอยู่ระดับปานกลาง พบความสัมพันธ์ทางบวกระหว่างพฤติกรรมของมารดาในการป้องกันโรคมือเท้าปากกับความรู้อยู่เกี่ยวกับโรคมือเท้าปาก การรับรู้ความสามารถตนเอง และการสนับสนุนทางสังคม ( $r = 0.54, P < 0.01, r = 0.44, P < 0.01$  และ  $r = 0.57, P < 0.01$  ตามลำดับ) **สรุป:** มารดาของเด็กเล็กชาวเวียดนามมีพฤติกรรมป้องกันโรคมือเท้าปากระดับปานกลาง และพบว่าสัมพันธ์กับความรู้อยู่ การรับรู้ความสามารถตนเอง และการสนับสนุนทางสังคม พยาบาลควรรักษาความรู้โรคมือเท้าปาก และส่งเสริมการรับรู้ความสามารถตนเองและการสนับสนุนทางสังคม

**คำสำคัญ:** โรคมือเท้าปาก, ความรู้, สมรรถนะตนเอง, พฤติกรรมของมารดา, การป้องกัน, เวียดนาม

## Abstract

**Objective:** To examine Vietnamese mothers' preventive behavior on the Hand, Foot and Mouth Disease (HFMD) for their children and determine the association between such preventive behavior and the mothers' knowledge about HFMD, self-efficacy, and social support. **Method:** A cluster random sampling was used to recruit the sample of 97 mothers with young children receiving services at four child care centers in Hai Duong City, Vietnam. Data were collected from August to September 2015. Self-report questionnaires consisted of 1-demographic record, 2-the maternal behavior in prevention of HFMD, 3-the knowledge about HFMD, 4-the perceived self-efficacy and 5-the Multidimensional Scale of Perceived Social Support (MSPSS). Cronbach's alpha coefficients of questionnaires 2 – 5 were 0.81, 0.81, 0.85 and 0.86, respectively. Descriptive statistics and Pearson correlation coefficients were used for data analysis. **Results:** Vietnamese mothers had moderate mean score of HFMD preventive behaviors for their children (73.81 ± 8.70). This maternal preventive behavior was positively correlated with knowledge about HFMD, perceived self-efficacy, and social support ( $r = 0.54, P < 0.01, r = 0.44, P < 0.01$  and  $r = 0.57, P < 0.01$ , respectively). **Conclusion:** Vietnamese mothers of young children had moderate score of preventive behaviors on HFMD. The preventive behavior was positively associated with knowledge, self-efficacy, and social support. Nurses could provide knowledge, and promote maternal self-efficacy and social support.

**Keywords:** hand, foot and mouth disease (HFMD), knowledge, self-efficacy, maternal behaviors, prevention, Vietnam

## Introduction

The hand, foot and mouth disease (HFMD) is an infectious disease caused by a variety of human enteroviruses, including enterovirus 71 (EV71), coxsackievirus A16 (CA16) and some serum types of echovirus. HFMD has been commonly found in children, of which most cases occur in preschool children with the highest incidence observed in children under 3 years old.<sup>1</sup> According to HFMD Forum Report, it showed that more than 50% of children under the age of 5 years in the world are at

risk of HFMD.<sup>2</sup> HFMD has increasing potential to become a health problem among young children, especially in Vietnam.<sup>3</sup> In addition, rates of EV71 household contamination and transmission were high, and the strain mainly affects young children.<sup>4</sup>

The source agent easily contaminates and spreads to cover many areas in the household such as living room, kitchen, and bathroom.<sup>5</sup> It could also transfer to people, especially among young children in the house. These are the

reasons why household exposure is the original contributor for HFMD to happen.<sup>6</sup> The Vietnam Ministry of Health indicated that 80% of children were infected with HFMD in household, 41% were transmitted from mothers, and 60% HFMD cases were caused by EV71.<sup>7</sup> Moreover, the incubation of HFMD lasts from three to five days. During this period, since the infected children have not shown signs or symptoms, the mothers will not know that the children are sick and take them to child care centers as usual. Consequently, children have close contact and the viruses are spread to other children and the environment.<sup>8</sup> Thus, children in the child care center are more easily infected with HFMD.<sup>9</sup> However, young children rely mostly on their caregivers, especially their mothers. In this situation, the role of the mother is very important to ensure the children's behavior to prevent HFMD.<sup>10,11</sup> Many prior studies documented that the disease prevention and control in young children relied heavily on good hygienic behavior of their caregivers or mothers since HFMD mainly affected young children and there has been no vaccine for HFMD so far.<sup>4</sup> Similarly, it has been confirmed that good hygiene was the effective method to prevent and control viral and bacterial infection.<sup>12</sup>

In addition, the effective treatment on HFMD is not available currently and there has been no vaccination against Enterovirus infection. Thus, personal hygiene behavior, such as hand washing, dietary hygiene and avoidance of contact with causal agents, was the most effective method to reduce the spread of infections.<sup>12</sup> Therefore, maternal behavior in prevention of HFMD is a key role to keep their children free of infection risk.

Evidence suggested relevant factors about preventive behaviors of HFMD. They included knowledge, self-efficacy and social support. Several studies have found a positive correlation between knowledge of caregiver and caregiver's preventive behavior towards HFMD in child care centers.<sup>12-16</sup> Parent self-efficacy was strongly linked to parenting behaviors and child health outcomes.<sup>17-19</sup> Self-efficacy has been identified as an influential factor in the practice of many preventive health behaviors.<sup>14,20</sup> Moreover, to promote mothers to perform a regular health behavior to prevent children from risk factors, they should get support for this important role from their husband, family and others.<sup>21-23</sup>

The PRECEDE-PROCEED model<sup>24</sup> and relevant literatures suggested that knowledge, self-efficacy, and

social support were related to behavior, and knowledge as an antecedent to the behavior. Persons with strong efficacy beliefs were more confident in their capacity to execute a behavior.<sup>17,25</sup> Social support is one of the factors that is related to behavior. It helps people feel more confident by leading to an appropriate problem to cope with necessary behavior.<sup>26</sup> However, there is limited information about HFMD knowledge, perceived self-efficacy, social support and behaviors of mothers in prevention of HFMD in Vietnamese context. This study aimed to examine maternal preventive behavior for HFMD in their young children and determine the association between such maternal preventive behavior and knowledge about HFMD, perceived self-efficacy, social support. Therefore, this study would be beneficial for fundamental information to plan or develop an effective intervention to promote maternal behaviors in prevention of HFMD for their young children.

## Materials and Methods

A descriptive cross-sectional design was used to determine levels of Vietnamese maternal behaviors in prevention of HFMD in their young children, and determine the association between such behavior and the mothers' knowledge about HFMD, self-efficacy, and social support. Data were collected in Hai Duong city, Vietnam during August to September 2015.

The sample size was calculated by using Thorndike's formula as  $n \geq (10 k) + 50$ , where  $n$  was a sample size, and  $k$  as a number of variables. As a result, a sample size of 97 mothers was achieved.

A cluster random sampling technique was used to recruit a sample of 97 mothers who brought their children to receive service at four child care centers in Hai Duong City, Vietnam. Three stages of sampling were carried out. First, four out of 42 childcare centers were randomly drawn. These 42 centers shared similar characteristics based on the Vietnamese government's regulation. There were four classrooms of children aged 2, 3, 4 and 5 years in any given center. Based on these four different ages of children, one center was drawn for each age group by simple random sampling. As a result, four centers were randomly selected for each of 2-, 3-, 4-, and 5-year old classrooms. For each selected classroom, the children's mothers were invited to voluntarily participate in the study by convenience sampling

method. The inclusion criteria were being of an age of 18 years old or older, being the primary caregiver of children, and being fluent in Vietnamese language. Of the 97 participating mothers, there were 18, 25, 29, and 25 mothers of 2-, 3-, 4-, and 5-year old children classes.

### Research instruments

Participants were asked to complete the following five self-reported questionnaires. A demographic questionnaire contained mother's characteristics, including age, marital status, type of family, education, occupation, and family income. The child characteristics included gender, age, birth order, and number of sibling.

The maternal behaviors in prevention of HFMD questionnaire was used to measure behaviors of mother about how often her performing activities related to prevention of HFMD in young children.<sup>13</sup> It was originally developed in Vietnamese language.<sup>13</sup> There were 21 items of 5 subscales, including maternal hand washing (8 items), washing their children's hands (7 items), cleaning the children's toys (2 items), cleaning the house (2 items), and food hygiene (2 item). It was rated on a 5-point Likert-type scale (1-never, 2-rarely, 3-sometimes, 4-usually, and 5-always). The total score ranges from 21 to 105 where a higher score indicates a higher level of maternal behavior in prevention of HFMD. Le et al.<sup>13</sup> recommended interpreting behavior levels of high ( $\geq 84$ ), moderate (70 - 83.9) and low ( $< 70$ ). In addition, to compare behavior scores among subscales, an average of a possible range of 1 to 5 of each subscale was calculated. In our study, the questionnaire was found to have high internal consistency reliability with a Cronbach's alpha coefficient of 0.81.

The knowledge about HFMD questionnaire was used to measure understanding of the mothers about HFMD. It was also originally developed in Vietnamese language.<sup>13</sup> Its 40 items asked about the disease, signs, symptoms, complication, transmission and prevention. With a yes/no answer format, a score of 1 was given for any correct answer, and 0 for the wrong one. The total score ranged from 0 to 40 where a higher score indicated more knowledge about HFMD. Reliability found in our study was high with a KR-20 coefficient of 0.81.

Self-efficacy of the mothers about perception of their ability to prevent HFMD in children was measured by using the self-efficacy in prevention of HFMD questionnaire

developed by the researchers based on literature review and Bandura's work.<sup>25</sup> Back translation technique was used to translate this measure from original English into Vietnamese language.<sup>27</sup> The process of back translation ensured the scale's validity. It consisted of 20 items of 4 subscales of personal, environment and child hygiene, and feeding practice. The item responses ranged from 1-strongly disagree to 5-totally agree. The total score obtained from summing scores of all items ranged from 20 to 100. The higher score indicated higher maternal self-efficacy in preventing HFMD. Its Cronbach's alpha coefficient of 0.85 indicated high internal consistency reliability in our study.

The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure information, emotion, and instrument support that the mother received from family, friends, and significant others.<sup>28</sup> This scale was previously translated into Vietnamese language and tested with a Vietnamese sample.<sup>28</sup> The MSPSS contained 12 items which were rated on a 7-point Likert-type scale ranging from 1-very strongly disagree to 7-very strongly agree. The total score ranged from 12 to 84 where a higher score indicated higher received social support. In our study, the reliability of the scale was high with a Cronbach's alpha coefficient of 0.86.

### Data collection procedures

After approval was obtained (IRB No. 03-07-2558) from the Ethical Committee of the Faculty of Nursing, Burapha University, Thailand, and permission was granted from the directors of the four child care centers in Vietnam, the process of data collection had begun. Data were collected only by the researcher (first author) on Monday to Friday from 4 to 6 PM. Study purposes and the data collection processes were explained to mothers who met the study inclusion criteria and agreed to participate. In addition, their right to participate or withdraw from the study was also informed. For those willing to participate, the researcher asked them to sign a consent form. A set of questionnaires was given to the participant, which took about 45 – 60 minutes to complete.

### Data analyses

Frequency, percent, mean, range, and standard deviation were calculated to describe demographic information, maternal behavior in prevention of HFMD, knowledge about HFMD, perceived self-efficacy, and social support. Pearson's correlation coefficients were used to determine the

association between maternal behavior in prevention of HFMD in young children and knowledge about HFMD, perceived self- efficacy, and social support. A significance level was set at  $P < 0.05$ .

## Results

A total of 97 mothers of young children had their age ranged from 20 - 43 years with a mean of 30.06 years ( $S.D.$  = 4.45). Most of them were married (99.00%). About one half graduated at a university level (45.36%), and 34.02% graduated from high school. Government officer was the most common career (44.30%), followed by business owner (29.90%). Most of them lived in nuclear families (72.16%). Their family income ranged from US \$ 227 – 909 per month (approximately, US \$ 1 = 22,197 VND) with a mean of 453.9 ( $S.D.$  = 150.68). More than half of them had a family income lower than US \$ 450 per month (62.9%). More than half of the children were boys (51.5%). The majority of the families had two children (64.9%).

Mean overall score of maternal behaviors for HFMD prevention in young children was 73.81 ( $S.D.$  = 8.70), which was at a moderate level (Table 1). When considering each subscale, it was found that mean scores of maternal hand-washing was 27.42 ( $S.D.$  = 3.69), washing child's hands was 25.20 ( $S.D.$  = 3.50), clean the toy was 5.91 ( $S.D.$  = 1.07), clean the house was 7.22 ( $S.D.$  = 1.07), and food hygiene was 8.07 ( $S.D.$  = 1.07). In addition, when means of total and subscale scores were calculated to standardize their scores to a range of 1 to 5, the mean total score was 3.51 while mean subscale scores were 3.42, 3.60, 2.96, 3.61 and 4.06, respectively. The highest mean score was found in food hygiene (4.06) and the lowest one in cleaning the toy (2.96).

**Table 1** Mean, standard deviation, range, mean by item and level of the maternal behavior in prevention of hand-foot-mouth disease (HFMD) in young children (N = 97).

Maternal behavior in prevention of HFMD	Mean	S.D.	Possible range	Range found	Mean by item (range: 1-5)
Overall	73.81	8.70	21 – 105	59 - 92	3.51
Level = moderate					
<b>Subscale</b>					
Maternal hand-washing	27.42	3.69	8 – 40	20 - 36	3.42
Wash child's hands	25.20	3.50	7 – 35	18 - 32	3.60
Clean the toy	5.91	1.07	2 – 10	4 - 9	2.96
Clean the house	7.22	1.07	2 – 10	5 - 10	3.61
Food hygiene	8.07	.93	2 – 10	5 - 10	4.06

Descriptive statistics of the study variables were also calculated. Mean scores of knowledge about HFMD was 32.87 ( $S.D.$  = 3.11), perceived self-efficacy was 71.60 ( $S.D.$  = 6.27) and social support was 58.02 ( $S.D.$  = 5.08) (Table 2).

**Table 2** Mean, standard deviation and range of scores of knowledge about hand-foot-mouth disease (HFMD), perceived self-efficacy, and social support among Vietnamese mothers (N = 97).

Variables	Mean	S.D.	Possible range	Range found
Knowledge about HFMD	32.87	3.11	0 – 40	25 - 39
Perceived self-efficacy	71.60	6.27	20 - 100	58 - 88
Social support	58.02	5.08	12 - 84	46 - 69

Pearson's correlation coefficients were carried out to determine associations between the study variables. All assumptions for all statistical analyses were met. The results revealed that there were significantly positive correlations between maternal behavior in prevention of HFMD and knowledge about HFMD, perceived self-efficacy, and social support ( $r = 0.54$ ,  $P < 0.01$ ,  $r = 0.44$ ,  $P < 0.01$ , and  $r = 0.57$ ,  $P < 0.01$ , respectively) (Table 3).

**Table 3** Pearson's correlation coefficients ( $r$ ) between the study variables in maternal behavior in prevention of hand-foot-mouth disease (HFMD) (N = 97).

Variables	Maternal behavior in prevention of HFMD ( $r$ )
Knowledge about HFMD	0.54*
Perceived self-efficacy	0.44*
Social support	0.57*

\* $P < 0.01$

## Discussions and Conclusion

Since most of these Vietnamese mothers had to take care of their own young children at home due to their role and responsibility, it was thus found that these mothers had a moderate level of behaviors in HFMD prevention for their child ( $73.81 \pm 8.70$ ). Most participants in this study were educated, employed outside the home and had 2 children in their family. These could make the mother too busy for a paid job, housework, and caring for her children.<sup>18</sup> In addition, the children with an age of 2 to 5 years relied heavily on their mothers. The maternal behavior in

preventing HFMD referred to actions of Vietnamese mothers, including maternal hand washing, washing their children's hands, cleaning the children's toy, house cleaning, and food hygiene. When considering each subscale of maternal behaviors in preventing HFMD, cleaning the children's toy was performed the least ( $M = 2.99$ ), while food hygiene was taken care of the most (Table 1). It was possible that the mothers understood and were aware that feeding their children had to be done carefully regarding cleanliness. On the other hand, they might not be adequately knowledgeable about cleaning toys for their children to prevent HFMD infection. Nurses and related health care providers should encourage the mothers to properly clean the toys.

The finding of this study showed that there was positive correlation between maternal knowledge about HFMD and maternal behavior in preventing HFMD in young children ( $r = 0.545$ ,  $P < 0.01$ ). It could be implied that when a mother had more knowledge, their preventive behavior was better. According to PRECEDE-PROCEED model<sup>24</sup>, knowledge played as a significant antecedent of behavior. This was supported by our study finding. It was also congruent with several prior studies showing that caregivers who were more knowledgeable about HFMD had higher behavior score in preventing HFMD for their children.<sup>14,15</sup> Since research evidence related to HFMD prevention of mothers was limited, similar studies, but in other diseases, were used to illustrate for comparisons here. Studies about diarrhea in young children reported that mothers who were more knowledgeable about oral rehydration solution, would be more effective in preventing severe dehydration in their children.<sup>29,30</sup> A positive association between knowledge and behavior was documented in another study where the authors revealed that housewives with more knowledge about dengue infection, had better maternal behavior in preventing dengue infection in their children ( $P < 0.05$ ).<sup>31</sup> A study of Hwang et al. also found that women with greater knowledge about malaria were more likely to prevent malaria in their young children ( $P < 0.001$ ).<sup>32</sup>

There was a significantly positive correlation between perceived self-efficacy and maternal behavior in prevention of HFMD in young children ( $r = 0.44$ ,  $P < 0.01$ ). It could be implied that mothers with greater confidence of their ability would better perform their behavior in preventing HFMD in their young children. PRECEDE-PROCEED model explained that self-efficacy guided a person's behavior and motivated

how to perform activities well.<sup>24</sup> In addition, perceived self-efficacy influences all aspects of behavior, including the acquisition of new behaviors, and inhibition and disinhibition of existing behaviors.<sup>20</sup> When people believed that they are able to implement a behavior and to see significant health benefit, they will effectively perform that behavior.<sup>25</sup> Several studies also reported that increasing self-efficacy would most consistently increase preventive behaviors.<sup>19,33,34</sup> Moreover, Quick et al. concluded that one of the reasons for the striking improvement in water treatment and storage behavior of mother was the mother's sense of self-efficacy, which was derived from their perceived ability to prevent diarrhea for their children.<sup>35</sup> Hashemiparast and colleagues also found a significant positive correlation between maternal self-efficacy and maternal behavior in preventing urinary tract infection for their children ( $r = 0.30$ ,  $P = 0.014$ ).<sup>36</sup>

The current study also showed important evidence in positive relationship between social support and maternal behavior in preventing HFMD in their young children ( $r = 0.57$ ,  $P < 0.01$ ). It could be implied that mothers with higher social support would have better behavior in preventing HFMD for their child. This finding could be explained by PRECEDE-PROCEED model of Green and Kreuter.<sup>24</sup> Social support is an important factor to enhance and promote ability of people to evaluate other resources to carry out health behaviors. Moreover, social support would help people feel more confident by leading to an appropriate behavior.<sup>37</sup> Bandura proposed that social support is one of the important factors that can facilitate or impede the performance of behavior.<sup>25</sup> This result was similar with the finding from previous studies. Pamela and Sharon reported that significant correlations existed between both emotional and material support and maternal behaviors in caring for their child.<sup>22</sup> Consistently, Silberman indicated that when mother had greater emotional support from friend and grandmother, they would have more success in performing the behavior in caring for their child.<sup>23</sup> In addition, Htay and co-workers found that the mothers who received advice from health professionals, had good preventive behavior towards diarrhea in their children ( $P < 0.01$ ).<sup>38</sup>

The findings of this study indicate that knowledge, perceived self-efficacy and social support were related to maternal behavior in prevention of HFMD for their young children. Therefore, nurses and health care providers should promote knowledge to mothers about HFMD and counsel the

mothers to increasingly perform preventive behavior to their young child, especially toy cleaning. In addition, maternal self-efficacy and social support should be promoted and strengthened. Future studies pertaining to predictors and intervention on enhancing maternal behavior on HFMD prevention should be carried out, especially in Vietnam.

Since our study was conducted in only one Vietnam city, Hai Duong City, the findings could be generalized with limitation. Studies in a wider geographical area should be pursued.

## Conclusions

There were significantly positive correlations between maternal behavior in prevention of HFMD in their young children and maternal knowledge about HFMD, perceived self-efficacy, and social support. Nurses and health care providers should promote and enhance knowledge to mother about HFMD and counsel the mother to increasingly perform prevention behavior to their young child, especially toy cleaning. In addition, maternal self-efficacy and social support would be promoted and strengthened.

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