

# THE RELATIONSHIP BETWEEN MATERNAL CHILD-FEEDING PRACTICES AND OVERWEIGHT IN HMONG PRESCHOOL CHILDREN

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**Objective:** Maternal child-feeding practices have been linked to overweight in several studies. Overweight is a prevalent condition in Hmong preschool children in the United States, therefore, the purpose of this study was to determine whether maternal child-feeding attitudes and practices were associated with overweight in Hmong preschool children.

**Design:** The Child-Feeding Questionnaire (CFQ) was revised and administered to Hmong mothers with normal-weight and overweight children.

**Setting:** Women, Infant, and Children Supplemental Food Program (WIC) clinics and community centers in the Minneapolis-St. Paul metropolitan area.

**Participants:** Hmong mothers of normal-weight ( $n=45$ ) and overweight ( $n=35$ ) children.

**Main Outcome Measures:** Relationships between maternal perceptions of child's weight, practices in child feeding, including monitoring, restriction, and pressure to eat, and overweight status in children.

**Results:** No association was found between maternal attitudes and practices in child feeding and body mass index (BMI) of the child except for mother's perception of her child's weight. Mother's perception of her child's weight was also associated with maternal restriction of certain foods. Mother's education and children's weight status were weakly positively associated. Mothers with more education tended to be younger and to work outside the home.

**Conclusion:** The lack of a relationship between maternal child-feeding practices and children's weight status may be due to factors such as mother's education, role of other caregivers, and cultural factors. (*Ethn Dis.* 2006;16:187-193)

**Key Words:** Feeding Practices, Hmong, Overweight Children

## INTRODUCTION

National Health and Nutrition Examination Survey (NHANES) data (2000-2002) showed that 10.3% of children aged 2-5 years were overweight compared to 7.2% based on earlier NHANES data (1988-1994).<sup>1,2</sup> National data from the Women, Infant, and Children Supplemental Food Program (WIC) showed an increase in overweight prevalence among preschool children from 11% in 1992 to 13.2% in 1998.<sup>3</sup> According to 2002 CDC Pediatric Nutrition Surveillance System data for low-income children aged two to five years participating in federally funded child-health programs, 12.3% of non-Hispanic White, 12.0% of non-Hispanic Black, 19.4% of Hispanic, and 13.2% of Asians were overweight.<sup>4</sup> The prevalence rates of overweight for preschool children participating in the WIC program in Minnesota in 1998 were similar to national rates (12.0% of non-Hispanic White, 14.0% of African American, 19.0% of Hispanic), however the percentage of Asian preschool children who were overweight was higher (20.8%) than the national prevalence.<sup>3</sup>

The largest Asian population group in Minnesota is Hmong.<sup>5</sup> According to US Census data from 2000,  $\approx 169,000$  Hmong live in the United States, primarily in California (65,000), Minnesota (42,000), and Wisconsin (34,000).<sup>6</sup>

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In an earlier study, approximately one of four low-income Hmong children aged three and four in Minnesota had weight-for-height greater than the 95th percentile.<sup>7</sup> A longitudinal study in Hmong children from birth to five years showed a comparable increase in weight gain among Hmong and non-Hispanic White children but a significant difference in height gain between these two groups.<sup>8</sup>

Parents influence food preferences and eating behaviors of children through environmental factors, including parental attitudes and eating behaviors, food availability and accessibility in the home, as well as child-feeding practices.<sup>9-11</sup> Several instruments have been developed to evaluate the relationship between child-feeding practices and overweight status in young, non-Hispanic White, African-American, and Hispanic children,<sup>12-14</sup> however these studies did not include a significant proportion of Asian children. The Child-Feeding Questionnaire (CFQ)

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developed by Birch et al<sup>12</sup> is one of the most widely used measures that assesses maternal attitudes, concerns, and practices in child feeding and perceptions about child weight. The questionnaire contains three items to measure attitudes about perceived child weight status (internal consistency of Cronbach  $\alpha=.83$ ), four items to measure perceived parent weight ( $\alpha=.71$ ), three items to measure concern about the child's weight ( $\alpha=.75$ ), three items to measure perceived responsibility for feeding the child ( $\alpha=.88$ ), eight items to measure the extent of use of a restrictive feeding style ( $\alpha=.73$ ), four items to measure likelihood of pressuring the child to eat ( $\alpha=.70$ ), and three items to measure the degree to which mothers monitor intake of sweets, snack foods and high-fat foods ( $\alpha=.92$ ). Confirmatory factor analysis has provided support for the validity of the CFQ in school-aged children.<sup>12</sup>

Results from studies involving families with preschool and school-aged children with the CFQ suggest that a high degree of parental control over food intake can interfere with the development of the child's ability to self-regulate food intake, thereby contributing to childhood overweight.<sup>12,15-16</sup> A recent review of the child-feeding literature and other studies showed that restrictive or authoritarian feeding practices and child obesity predisposition may be especially important factors in this relationship.<sup>17-18</sup> However, other studies have not supported a similar relationship between controlling maternal feeding practices and weight status of school-aged children.<sup>19-20</sup> More recently, Patrick et al<sup>21</sup> showed that an authoritative feeding style favoring a balance between restrictive and permissive feeding can positively influence food consumption patterns of preschool-aged children. However, the effects of authoritarian feeding on child weight status were not explored.

Results from previous studies with parents of preschool-aged children from

diverse ethnic backgrounds indicated that cultural beliefs may influence child-feeding practices.<sup>22-23</sup> These results may be due to cross-cultural variation in level of concern about underweight, acceptance of overweight as perceived normal weight, inclusion of culturally specific foods, and in child rearing.<sup>22,24</sup> Hmong parents were less concerned about overweight in their children than underweight because of cultural beliefs and previous war experiences.<sup>25</sup> The Hmong also place a high value on family and children<sup>26</sup> and expect their children to maintain their cultural traditions. Hmong child-rearing philosophy or "hlu," which is defined as "loving and pleasing children to minimize their unhappiness and distress," may lead to permissive parenting styles in Hmong families.<sup>23</sup>

Limited information is available about maternal child-feeding attitudes and practices in Hmong families and the relationship to overweight in Hmong preschool children. The purpose of this study was to test the hypothesis that maternal attitudes and practices in child feeding were related to overweight status in Hmong preschool children. Results can be used to develop effective interventions to prevent overweight and enhance long-term health for Hmong children.

## METHODS

Study participants were Hmong mothers between the ages of 18 and 40 years with a three- to five-year-old normal-weight or overweight child. Mothers lived in the Minneapolis/St. Paul metropolitan area. In the first phase of the study, preliminary qualitative information was collected from Hmong mothers to assess the relevance of previously formulated child-feeding constructs which serve as the basis for the existing CFQ developed by Birch et al.<sup>12</sup> After minor revisions were made to the CFQ, it was administered

to another group of Hmong mothers in the second phase of the study. The study used informed consent procedures and was approved by the University of Minnesota Institutional Review Board prior to data collection.

In the first phase, individual interviews were conducted with 21 Hmong participants recruited through flyers distributed at a church and at two community centers (12 mothers of a normal-weight child and nine mothers of an overweight child were included). A child was defined as overweight if the mother reported that she had been told by a health professional that her child was overweight. The open-ended interview questions related to items from the existing CFQ<sup>12</sup> and the role of other caregivers. The questions were developed to assess the presence and relevance of specific feeding constructs to determine if the existing CFQ constructs were meaningful to Hmong mothers. The interviews were audiotaped and transcribed verbatim. All interviews ( $n=19$ ) were conducted in English except two, one was conducted in Hmong through a Hmong nutritionist who translated the responses into English, and one was conducted in Thai and translated into English by the researcher, a female pediatrician trained in Thailand. Transcripts were independently coded by two investigators according to coding categories based on the interview questions and study objectives. The two investigators worked together to generate common themes based on the coded responses. Results showed that child-feeding constructs in the existing CFQ reflected the attitudes and practices of Hmong mothers regarding child-feeding. Therefore, only minor modifications were made to the original items to provide appropriate examples of sweets, snack foods, or high-fat foods, thus retaining the original seven-factor structure of the CFQ. An additional seven items were added related to the role of other caregivers in child feeding. The revised questionnaire

consisted of the original 31 CFQ items plus the additional seven items, each scored on a five-point Likert-type scale. Demographic data were also collected (parents' age, education, employment, birthplace, and household composition). The questionnaire was pilot-tested for its understanding and appropriateness with four mothers and was made available in English. It was also translated into Hmong and back-translated into English by a Hmong nutritionist to check for appropriate meaning.

The revised CFQ was administered to participants recruited at community centers and WIC sites. An attempt was made to recruit  $\approx 80$  women with either overweight or normal-weight children based on a sample size calculation (80% power to detect a mean difference between the two groups of at least .5 based on previous studies<sup>12</sup> at a significance level of .05). After parenting classes at the community centers, the instructor introduced the researcher to the group, the researcher explained the study and asked for volunteers (>90% response rate). At WIC sites, the researcher approached women waiting for WIC appointments, explained the study and asked women if they were willing to complete the questionnaire (50% response rate). Children's height and weight were measured according to standard procedures<sup>27</sup> by WIC staff at WIC sites or by the researcher at the community centers. Information on height and weight were combined to calculate the child's body mass index (BMI) before plotting on the sex- and age-specific BMI growth charts.<sup>28</sup> Questionnaire data from mothers were divided into two groups based on their child's BMI: mothers with a normal-weight child and mothers with an overweight child. A child was defined as overweight when BMI was at or above the 95th percentile of the growth charts. Data from three mothers whose children had a BMI less than the 5th percentile were included in the normal

weight group. Eliminating the data from these three mothers did not affect the results.

Data were analyzed by using Statistical Package for the Social Sciences software (SPSS version 11.0, SPSS Inc., Chicago, Ill). Cronbach  $\alpha$  coefficients were used to determine the internal consistencies for each factor scale of the revised CFQ. All factor scales had acceptable internal consistencies ( $\alpha > .70$ ) except for the monitoring scale, which was marginally acceptable ( $\alpha = .60$ ) and the perception of maternal weight scale ( $\alpha = .28$ ). Due to its low internal consistency, data for the factor based on perception of maternal weight was not included in further analysis. The relationships between child's weight status and the CFQ factors were determined by using logistic regression analysis with child's weight status as the dependent variable and the six CFQ factors as independent variables. Associations between mother's characteristics and the child's weight status were determined with Spearman correlation analysis, while Pearson correlation analysis was used to determine associations between CFQ factors. Differences in parental characteristics for parents with normal versus overweight children were determined by using a chi-square test or independent sample *t* test. Significance was indicated by  $P \leq .05$ .

## RESULTS

Eighty mothers completed the questionnaire. Forty-five (56%) were mothers of normal-weight children, and thirty-five (44%) were mothers of overweight children. Sixty-eight mothers completed the questionnaires in English, and 12 mothers completed the questionnaires in Hmong. Approximately one third (17/45) of the normal-weight children were at risk of becoming overweight (BMI 85th–94th percentile). The height-for-age percentiles were comparable among the two

groups, with 55% of all children below the 50th percentile and 12% under the 5th percentile. More overweight boys than girls were in this study ( $P = .005$ ).

No significant differences were seen in age, education, birthplace, number of adults or children in the home for mothers and fathers in either group (Table 1). Although the education level of mothers did not differ by weight status of their child according to chi-square testing (Table 1), correlation analysis showed a weakly positive association between education level of the mother and weight status of her child ( $r = .231$ ,  $P < .05$ ). Mothers who had a higher level of education were more likely to be younger ( $r = -.433$ ,  $P < .01$ ), work outside the home ( $r = .362$ ,  $P < .01$ ), and had fewer children ( $r = -.637$ ,  $P < .01$ ).

Hmong mothers, in general, indicated that they felt a high level of responsibility for feeding their child appropriately and reported using a moderate level of control in child-feeding practices regarding restriction and monitoring of certain foods such as sweets, high-fat foods, and snack foods (Table 2). They also reported moderate use of pressure to get their child to eat during mealtime, while many reported that they used foods as a reward for good behavior. Based on the seven additional items added to the CFQ regarding the role of other family members in child feeding, mothers reported that fathers' and grandmothers' feeding practices were similar to those of mothers.

No significant differences were observed between the six scaled factors regarding mothers' attitudes and practices related to child-feeding between the two groups except for mother's perception of her child's weight (Table 2). Mothers with overweight children tended to perceive their child as overweight more often than mothers with normal-weight children. Approximately 90% of mothers with normal-weight

**Table 1. Demographic characteristics of parents by weight status of child\***

Characteristics	Parents of Normal-Weight Children	Parents of Overweight Children	P value
<b>Mothers</b>			
Age† (y) (n=70)	31.4 ± 6.9	29.2 ± 8.7	.232
Education (%) n			.156
High school or less	85 (34)	62 (20)	
Some college or college graduate	15 (6)	38 (12)	
Employment (%) n			.009
Not employed	62 (26)	39 (13)	
Employed part or full time	38 (16)	61 (20)	
Birthplace (%) n			.222
United States	3 (1)	6 (2)	
Southeast Asia	98 (41)	91 (30)	
<b>Fathers</b>			
Age (y) (n=65)	35.1 ± 6.9	32.8 ± 10.3	.290
Education (%) n			.915
High school or less	64 (22)	59 (19)	
Some college or college graduate	36 (12)	41 (13)	
Employment (%) n			.904
Not employed	40 (15)	34 (11)	
Employed part or full time	60 (23)	66 (21)	
Birthplace (%) n			.435
United States	3 (1)	6 (2)	
Southeast Asia	97 (37)	94 (30)	
Number of adults in the home† (n=71)	2.3 ± 0.8	2.8 ± 1.6	.141
Number of children in the home† (n=73)	5.1 ± 2.7	4.4 ± 3.4	.301
Number of children aged 3–5 yr† (n=71)	1.5 ± 0.6	1.3 ± 0.5	.201

\* According to chi-square test or independent sample *t* test, where total *n*≠80 mothers and 70 fathers, data are missing.

† Mean ± standard deviation.

children reported that their child was normal weight, while only 23% of mothers with overweight children reported that their child was overweight.

These responses indicated that a small number of mothers with overweight children perceived their child as overweight.

Child's BMI was positively related to perception of child's weight by all mothers (*r*=.419, *P*<.01), and perception of child's weight was, in turn, related to maternal restriction of child's food intake (*r*=.230, *P*<.05). Mothers who were more concerned about their child's eating reported a higher degree of restriction and pressuring children to eat. Mothers who scored higher in restriction also scored higher in pressure to eat and monitoring.

## DISCUSSION

Compared with results from other studies that involved parents of non-Hispanic White and Hispanic preschool children<sup>12</sup> and African-American school-aged children,<sup>15</sup> our study showed similar mean scores for the six factor scales. Even though previous studies have suggested that parental child-feeding practices may be related to overweight in young children,<sup>12,15–16</sup> no direct relationship was observed in the current study between maternal child-feeding attitudes and practices based on the six factor scales and overweight status in Hmong preschool children. These results are consistent with a population-based study with parents of 8–9 year old children from

**Table 2. Relationship between CFQ factors and whether mothers have normal or overweight children<sup>1</sup>**

Factors	Mothers with Normal Weight Children (n=45)	Mothers with Overweight Children (n=35)	Beta Parameter		P-value
	Mean ± SD	Mean ± SD	Estimate	Standard Error	
Perceived responsibility (α=.77)	3.8 ± 0.8	3.9 ± 0.9	0.065	0.309	0.832
Perceived child weight (α=.72)	2.9 ± 0.3	3.1 ± 0.5	1.965	0.842	0.020*
Concern (α=.87)	2.5 ± 1.1	2.4 ± 1.1	0.022	0.226	0.922
Restriction (α=.79)	3.2 ± 0.7	3.2 ± 0.8	-0.364	0.366	0.320
Pressure to eat (α=.72)	3.2 ± 0.7	3.4 ± 0.9	0.231	0.340	0.497
Monitoring (α=.60)	3.2 ± 0.5	3.2 ± 0.7	0.107	0.282	0.704

<sup>1</sup> The mean value for each factor is based on the following scoring for each item within the factor scale:

Perceived responsibility (1=never, 2=seldom, 3=half of the time, 4=most of the time, 5=always)

Perceived child weight (1=markedly underweight, 2=underweight, 3=normal, 4=overweight, 5=markedly overweight)

Concern about child weight (1=unconcerned, 2=a little concerned, 3=concerned, 4=fairly concerned, 5=very concerned)

Restriction and Pressure to eat (1=disagree, 2=slightly disagree, 3=neutral, 4=slightly agree, 5=agree)

Monitoring (1=never, 2=rarely, 3=sometimes, 4=mostly, 5=always)

\* *P*<.05 according to logistic regression analysis.

α=Cronbach coefficient alpha.

The range of possible mean values for each factor scale is 1–5.

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*. . .no direct relationship was observed in the current study between maternal child-feeding attitudes and practices based on the six factor scales and overweight status in Hmong preschool children.*

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diverse ethnic and socioeconomic backgrounds.<sup>20</sup> Similarly, several observational and survey studies with mothers of preschool and school-aged children have shown that specific factors involved in maternal child-feeding practices such as control over child-feeding,<sup>14,19,29</sup> or pressuring children to eat more<sup>13,14</sup> were not consistently associated with eating behavior or weight status of children.

Several factors may contribute to the lack of a relationship between maternal attitudes and practices in child-feeding and overweight status of the children in the current study. The parental perception that a child is overweight may contribute to greater control over feeding in an effort to address weight status. Francis et al<sup>16</sup> showed that a mother's perception and concern about her child's weight strongly predicted maternal use of restriction and pressure to eat, independent of the child's actual weight. In the current study, a small number of Hmong mothers with overweight children (23%) perceived their child as overweight. Similar to this study, Ikeda et al<sup>25</sup> found that Hmong mothers may be more concerned about their child's thinness than fatness. Other studies have also shown a poor awareness of overweight and health risk, a small percentage of parents of overweight and obese young children are likely to describe their child as overweight.<sup>30-31</sup> Parental misperception of

their child's weight may be due to a misunderstanding of the definition of overweight or lack of concern about the importance of overweight in young children.

Cultural beliefs and practices regarding overweight, child rearing, and feeding may differ among diverse ethnic groups. A large body size is more socially acceptable among minorities, including Hmong, and low-income mothers compared to non-Hispanic Whites and high-income mothers.<sup>22-25,32</sup>

Some evidence shows that higher maternal education and mother's employment away from home were associated with overweight status in Hmong children in the current study. Since education and employment were correlated, we could not determine in this small sample whether they have independent effects on the child's weight status. Previous studies showed that mother's employment increased the risk of overweight in children, independent of family's socioeconomic status.<sup>33-35</sup> Working mothers may have less time to devote to concerns about child feeding. When mothers spend more time working outside the home, other caregivers such as fathers, grandmothers, and daycare centers may be more involved with child rearing and feeding, which may affect overweight in children. Additionally, Hmong mothers with more education may be more acculturated because they have spent more years in the American school system and worked more outside the home. These mothers may provide more westernized foods that are higher in energy density compared to traditional Hmong foods, which consist mainly of rice, meat, and vegetables. Additional study with a larger sample of Hmong women is necessary to further define the effects of education and employment on child's weight status.

This study has several limitations. The findings were based on a small convenience sample of Hmong mothers

with preschool-aged children, and most were low-income. Therefore, results from this study cannot be generalized to all Hmong mothers. Biased sampling may have influenced the results because only those who were accessible and cooperative participated. Rating errors may occur when mothers were uncertain about a questionnaire item, however, the preliminary qualitative phase of this study helped to eliminate this possibility. Finally, the CFQ may be missing items relevant to characteristics of Hmong mothers and families that represent additional factors that contribute to childhood overweight or influence child-feeding practices.

Because of the rising prevalence of overweight in children and adults, effective interventions for treating and preventing overweight in preschool-aged children are needed.<sup>36</sup> Results from longitudinal studies suggest that parental involvement in intervention programs for overweight children significantly improved weight status of children.<sup>37,38</sup> Cultural beliefs about a healthy body size in Hmong families may differ from the perspective of public health officials, therefore, nutrition education for Hmong mothers with young children should define overweight, explain the causes of overweight, and relate overweight to health and social consequences. Hmong families often include extended family, therefore education regarding child feeding should include grandparents and others in addition to parents to avoid conflicts that may arise based on generational differences in cultural beliefs and dietary practices. Qualitative interview results from the first phase of the current study showed that as Hmong families become more acculturated, some young adults may be eating foods that are considered less healthy "American foods." Nutrition education, therefore, should include appropriate diet, physical activity, and behavior modification content regarding feeding

young children in the context of having more American foods along with a traditional Hmong diet.

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## MATERNAL FEEDING AND CHILDHOOD OVERWEIGHT - Kasemsup and Reicks

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