The mediating role of mothers' attitudes towards feeding in the relationship between parenting styles and the eating behaviors of elementary school students

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Abstract

Nutritional behaviors are important in children’s physical and mental health. The present research investigated the eating behaviors of children according to the variables of parenting style and mothers' attitude towards feeding. The statistical sample included 160 elementary school students and their mothers who were selected using a multi-stage cluster method. The research tools were as follows: the knowledge and attitude questionnaire of mothers towards child feeding, the children's eating behavior questionnaire and the revised family communication model tool. Structural equation modeling was used to determine the mediating role of the mediator variable. The results of the present study showed that there was a positive and significant relationship between the conversational orientation and the
attitude of mothers towards children's feeding. And there was a negative and significant relationship between the conformity orientation and mothers' attitude towards children's feeding. On the other hand, a positive and significant relationship was obtained between the eating behavior variable and mothers' attitude towards children's feeding. It should also be mentioned that the fit indices of the model were also examined and favorable results were obtained.

**Keywords:** mothers' attitudes, feeding, parenting styles, eating behaviors

**Introduction**

Healthy eating, especially in early childhood, has always been one of the concerns of parents. Getting a suitable calories, proteins, and vitamins intake plays a significant role in the mental health and education and learning of children, especially students. Numerous studies have shown that good nutrition, not only affects children's physical health, but also their mental health as well. It also helps the child's physical, social, and emotional development (Liu, 2013). Studies have also shown that healthy eating reduces students’ stress and increases their academic success. Foods that contain protein increase the amount of learning (Fahlman et al, 2008). The quality of students' nutrition affects their learning, daily performance, and health in adulthood as well as influencing their intellectual growth and development and prevents diseases such as iron deficiency anemia, malnutrition, tooth decay, cardiovascular diseases, and cancer (Fathi et al, 2015). Factors such as academic success, learning, proper performance in school activities and homework, and reduced absence from school, all are influenced by various nutritional factors, among which the role of breakfast, considered as the most essential meal for children, is inevitable (Benton et al, 2001). Nutritional behaviors denote a wide range of a person's inclinations to eat different food. These tendencies consist of two basic parts, a large part of which is acquired through genetics, and the other part is acquired through the family and community (Wardle & Carnell, 2007). Nutritional behavior is mentioned in many articles with the names of desire to eat and eating behavior. Nutritional behavior is a natural behavior related to the habit of eating and choosing the foods we eat (Horak & Bamwesigye, 2016). Children's nutritional behaviors are definitely derived from their eating habits, which are influenced by family, and individual and environmental factors. Identifying these factors plays an important role in the formation of eating behaviors and
habits. Despite the importance of children's nutrition, parents' experiences show that many children do not have the desire to eat or have inappropriate nutritional behaviors, and identifying effective factors in this regard can have many practical and theoretical applications.

One of the environmental factors affecting children's nutritional behavior is parenting styles. The first and most stable institution that creates a child's behavior and personality is the family (Abassi et al, 2014). Parents who are have a close relationship with their child and have reasonable control over their children’s behavior are likely to be a more effective role model for their children and make them feel better self-care and self-sufficiency. Parenting styles can affect the formation of children's daily activities, nutrition and emotional functioning. Parental feeding practices may be defined as specific behavioral strategies that parents use to control what, how much, or when their children eat (Ventura & Brich, 2008). Children of mothers who resort to force feeding will later show aggressive feeding behavior (Powell et al, 2011). Children of parents who use an authoritarian parenting style, are likely to eat less healthy food. And children of parents who use authoritative style consume more fruit (Karbandi et al, 2009). Children of families with a permissive parenting style have less fruit and vegetable consumption, watch more hours of television, and consume more prepared food. But in families with a dominant style, family members eat together and the consumption of fruits and vegetables is high. Supportive and encouraging parenting is a branch of authoritative parenting that is associated with higher consumption of fruits and vegetables and helps children to eat healthier foods (Downpeter et al, 2013).

In addition to parenting styles, mothers' attitudes and beliefs about children's nutrition also influence children's nutrition. Mothers' awareness of the correct way to create appropriate nutritional behaviors has a direct impact on the quality of children's nutrition. Given that early childhood is the time when the child's eating habits develop rapidly, the attitude and awareness of mothers in relation to creating a suitable pattern of nutritional behavior has a direct effect on the quality of children's nutrition (Babazadeh et al, 2013). Mother's nutritional behaviors and attitudes are affected by some factors such as social, economic, and educational status, age, work position, and also mother's nutrition knowledge (Etal et al, 2012; Chungja et al, 2000; Cleod et al, 2011; Vereecken & Maes, 2010). Also, the attitude and belief of mothers about the role of supplementary nutrition increases the nutritional health of children (Salarkia et al, 2019). With respect to the importance of parenting styles through the mediation of parents' attitudes, Downpeter and colleagues (2013) believed that parenting
styles and the family environment can affect a child's diet. Parents influence their children's nutritional behaviors and their priorities, especially mothers who are considered as role models in their children's nutritional behavior. Therefore, the level of mother's nutritional knowledge and attitude can affect the eating behavior of their children (Cleod et al, 2011). Also, parents' food preferences have an effect on their children's nutritional behaviors. Sometimes, parents unintentionally encourage their children to be obese due to wrong attitudes and little information and even neglect (Harnack et al, 2008). Among the wrong attitudes in some families is that they give their children some inappropriate foods such as excessive sweets as a bribe (Etal & Sherry, 2004). Parents create conditions for children that may either promote healthy eating behaviors and normal weight gain, or create conditions that would increase their weight and inappropriate eating behaviors (Scaglioni et al, 2008).

In general, a review of the conducted research shows that some researchers have studied the role of various family factors affecting nutritional behavior. In this regard, the role of effective family factors such as parenting styles and mothers' attitudes towards feeding behavior have been mentioned. Shehbazi et al(2013) believe that nutritional behavior is a structure that is formed by the influence of different individual and family factors and changes the choice of food type by the individual. Therefore, it is significant to identify parenting styles and mothers' attitude towards nutrition, which has a direct impact on a person's nutritional behavior. Accordingly, it is necessary to investigate the role of parenting styles and sleep patterns with the mediating role of mothers' attitude towards nutrition on nutritional behavior. The results will be useful for application in different fields. Therefore, the question raised here is: To what extent can parenting styles with the mediating role of mothers' attitude towards nutrition affect nutritional behavior?

**Research Method**

This study was a correlational study on elementary school students and their mothers in Borazjan city, southern Iran. Sampling was done using the multi-stage cluster sampling method. For this purpose, three boys' and three girls' schools were randomly selected from all the girls' and boys' elementary schools in Borazjan city (45 girls' schools and 47 boys' schools). Then, two fifth graders and two sixth graders were randomly selected from each school and the students (80 girls and 80 boys) and their mothers were enrolled in the study.

*Instruments:*
Children's Eating Behaviors Questionnaire (CEBQ): This questionnaire was prepared by Wardle, Guthrie, Sanderson, and Rapoport (2001). It has 35 items scored on a 5-point Likert scale as follows: 1=never scored, 2=rarely scored, 3=sometimes scored, 4=often scored, and 5=always scored. Wardell and co-workers (2001) used Cronbach's alpha method to measure reliability and retest method, they reported the coefficients from 0.52 to 0.87. And they used factor analysis to check validity. This questionnaire consists of 8 dimensions, as follows: satiety responsiveness, slowness in eating, food fussiness, food responsiveness, enjoyment of food, desire to drink, emotional undereating, and emotional overeating.

In this study, confirmatory factor analysis with the maximum likelihood method was used to check the validity of the tool. In this regard, the goodness of fit index (GFI) as an absolute fit index showed a value of 0.90. In the category of comparative indices, incremental fit index (IFI), Tucker-Lewis fit index (TFI), and comparative fit index (CFI) were 0.95, 0.93, 0.95, respectively, indicating an ideal model fit. The measured indicators were the chi-square to the degree of freedom, which with the values of 1.8 indicated a very good fit of the model with the data. Also, as another parsimonious fit index, the root mean square error of approximation index (RMSEA) was examined, which was 0.73 and its significance level (PCLOSE) which was 0.15, which indicated the significance of the mean square error of approximation. So, the fit indices showed that there was a good fit between the proposed models and the observed data. After the factor analysis of the nutritional behavior, two main factors named avoidant nutritional behavior (including slowness in eating, food fussiness, emotional overeating and emotional undereating), and tendency behavior (enjoyment of food, food responsiveness, desire to drink, satiety responsiveness) were observed. It should be mentioned that in the present study, only the tendency behavior part was investigated and its reliability was obtained using the Cronbach's alpha method (0.87).

Also, the Family Communication Pattern Questionnaire (Fitzpatrick & Ritchie, 1990) was used to measure parenting patterns. It has 26 items scored on a five-point Likert scale (strongly agree, agree, have no opinion, disagree, and strongly disagree). This questionnaire has two dimensions, Conversational Orientation and Conformity orientation. Fitzpatrick and Ritchie (1994) used the retest method to study the reliability, and its value was 0.73-0.93. And to determine the validity of this questionnaire, they used content and criterion validity and reported favorable results.

In this study, to determine the validity of the instrument, confirmatory factor analysis with the maximum likelihood method was used. Cronbach's alpha was used to determine the
reliability of the questionnaire, which was 0.90 for the conformity orientation dimension and 0.93 for the conservational orientation dimension. This model was evaluated using three categories of absolute, adaptive and parsimonious fit indices. Goodness of fit index (GFI) as an absolute fit index was 0.85. IFI, TFI and CFI were 95. 0, 0.93, 0.95, respectively indicating an ideal fit. The parsimonious index examined was the Chi-square to the degree of freedom, which was 1.5 indicating a very good model fit to data. Also, as another parsimonious fit index, the RMSEA was examined, which was 0.56 and its significance level (PCLOSE) was 0.17, which indicated the significance of the mean square error of approximation. Therefore, the fit indices showed is a good fit between the proposed models and the observed data.

The knowledge and attitude questionnaire of mothers towards Children's feeding was prepared by Yabansi et al (2013). This inventory has 22 items scored as never, rarely, sometimes, often, and always. It indicated the knowledge and attitude of parents towards children's nutrition. Also, McLeod et al (2011) used Cronbach's alpha to calculate reliability. In this study, to determine the validity of the instrument, confirmatory factor analysis with the maximum likelihood method was used. Cronbach's alpha method was used to determine the reliability of the questionnaire which was 0.91. In this questionnaire, questions 1 and 22 were removed due to low factor loading. This model was evaluated using three categories of absolute, adaptive and parsimonious fit indices. GFI as an absolute fit index was 0.90. IFI, TFI, and CFI were 95 0.0, and 0.96 indicating an ideal model fit. The parsimonious indices examined were the Chi-square to the degree of freedom, which was 1.44 indicating a very good model fit. Also, as another parsimonious fit index, RMSEA was examined, which was 0.53 and its significance level (PCLOSE) was 0.37, which indicated the significance of the mean squared error of approximation. Therefore, the fit indices showed a good fit between the proposed models and the observed data.

**Results**

Since we aimed to investigate the mediating role of mothers' attitude towards feeding in the relationship between parenting patterns and eating behavior, Structural Equation Modeling, using Amos Software was used for data analysis. Table 1 shows the model fit indices and the regression coefficients.
Table 1. Model fit indexes

<table>
<thead>
<tr>
<th>Indices</th>
<th>X²/df</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>TLI</th>
<th>IFI</th>
<th>PRTIO</th>
<th>RMSEA</th>
<th>PCLOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of fit indices after modification</td>
<td>1.84</td>
<td>0.78</td>
<td>0.86</td>
<td>0.75</td>
<td>0.83</td>
<td>0.87</td>
<td>0.82</td>
<td>0.07</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The model fit indices in the table indicate model fitness. Also, the examination of the path coefficients in Table 2 show the significance of the direct paths related to the measurement model, which is a sign that all the subscales of the variables are representative for the relevant variable.

Table 2. Regression coefficients of measurement models

<table>
<thead>
<tr>
<th>Latent variable</th>
<th>observe variables</th>
<th>Standard coefficient</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tendency behavior to feeding</td>
<td>Reaction to food</td>
<td>0.44</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Enjoy to food</td>
<td>0.68</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Tendency to drink</td>
<td>0.44</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Responding to diet</td>
<td>0.45</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The structural relationships of the variables in the model, which include the direct effects of the variables, are shown in Table 3.

Table 3: Regression coefficients of the structural model

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimated value</th>
<th>Standardized assessment</th>
<th>standard error</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformity orientation to attitude</td>
<td>-0.11</td>
<td>-0.28</td>
<td>0.004</td>
<td>0.05</td>
</tr>
<tr>
<td>Conversational orientation to attitude</td>
<td>0.007</td>
<td>0.19</td>
<td>0.003</td>
<td>0.02</td>
</tr>
<tr>
<td>Conversational orientation to eating</td>
<td>-0.59</td>
<td>-0.22</td>
<td>0.24</td>
<td>0.01</td>
</tr>
<tr>
<td>behavior</td>
<td>6.75</td>
<td>0.88</td>
<td>1.91</td>
<td>0.001</td>
</tr>
<tr>
<td>Relationship between conversational</td>
<td>36.74</td>
<td>0.24</td>
<td>12.36</td>
<td>0.03</td>
</tr>
<tr>
<td>orientation and Conformity orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To estimate and determine the indirect path, the bootstrap command was used in Amos software, and the results are reported in Table 4. As shown, the indirect path is significant,
which indicates the significance of the mediating role of mothers' attitude in the relationship between parenting patterns and eating behavior.

### Table 4: Indirect model path using bootstrap

<table>
<thead>
<tr>
<th>Indirect path</th>
<th>value</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformity Orientation to Eating Behavior Mediated by Mothers' Attitudes to Children's Feeding</td>
<td>-0.24</td>
<td>-0.41</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>Conversational Orientation to Eating Behavior Mediated by Mothers' Attitudes to Children's Feeding</td>
<td>0.16</td>
<td>0.06</td>
<td>0.06</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Discussion**

The results of the present study confirmed the mediating role of mothers' attitude towards feeding in the relationship between parenting patterns and children's eating behavior. In this connection, the results showed that the direct conversational orientation had a positive and significant effect on the mothers' attitude towards children's feeding (0.19), which is in line with Skinner et al study (2005). These researchers state that when mothers are receptive to listening to their children with a positive attitude, they consider themselves important and effective and tend to establish more constructive relationships with their families. It is also consistent with the research of Peters et al (2013), who state that when parents spend time with their children and talk about nutrition with them, the level of empathy increases. When children talk to their parents about the food they like and it is healthy, they develop a more positive attitude towards prepared food. This question is also in line with Smetana’s research (2017). Smetana (2017) state that parents use rules and laws in the authoritative parenting style, which are prepared by children and parents together. It seems that reaching such results is quite reasonable and acceptable. Because the positive attitude of the parents creates an effective parent-child relationship and through the dialogue that occurs between the mother and the child, a pleasant feeling is created in the child. The more this attitude is pushed in a positive direction, the more conditions are provided for a positive dialogue. If the children do not agree with the attitude of the parents and do not follow the rules, the parents calmly oppose and involve them in important family decisions. Due to the positive attitude of the
mother, a sense of self-care and better sufficiency is created in the child. Therefore, children have fewer behavioral problems.

But in relation to conformity orientation, the results showed that conformity orientation directly and significantly predicted the mothers' attitude towards children's feeding in a negative manner (-0.28), which is consistent with the results of Brun and Ogden (2004) and Whear & Axford (2009). These researchers state that when children are under the control of their parents, they may be forced to eat the same food as them. But when the children know that they are not under the control of their parents, they still turn to the same food that may be unhealthy. This result is also consistent with the research of Powell et al (2011). These researchers state that the higher the level of conformity, imposition of parents' opinion on children and control, the more children will turn to unhealthy food. In the communication pattern of the mother's conformity to her children's food, she implements strict rules and norms that the children must follow without question. They are subject to the decisions of their elders and cannot even make decisions that are related to themselves (Smetana, 2017). It seems that the negative prediction by conformity orientation on the mothers' attitude to feeding is reasonable and possible because in this communication style, the mother pays less attention to the opinion and request of the children, and it is more the mother's request that is imposed on the feeding of the children. Therefore, the children may follow the parents' orders at the same moment, but in a long period of time. The result will be the opposite. If the mother determines behaviors and values that are not in accordance with the wishes of the children, the warmth of the relationship will be less, there will be more interference and more control and punishment. These actions will intensify when the number of children is more and the amount of family income is low. Because parents cannot take care of the needs of each child, as a result, the response rate is low and the demand increases.

With respect to the relationship between mothers' attitudes towards feeding and eating behavior, the results showed that mothers' attitudes positively and significantly (0.88) predicted the behavior of tendencies towards feeding. According to Yabansi et al. (2014), mothers who have a positive attitude about their children's feeding, children have a more normal weight, and their mothers prefer healthier foods, such as vegetables, fruits, and legumes, and avoid fast food. Roman (2014) believes that if a mother has a positive attitude towards her child's feeding, it means that the mother has been able to interact correctly with her child during feeding and is aware of the nature and type of food. And this positive attitude shows that the mother uses cooked and homemade food more. According to researchers such
as Fehlman et al (2008), the more positive attitude a mother has towards her child's nutrition, not only has she helped the child's growth, but has also helped her child emotionally and socially. Sherry and Atal (2004) state that if the mother has an inappropriate attitude, she gives inappropriate foods such as sweets to her children as a bribe. Parents provide conditions for children that may promote healthy eating behavior with normal weight gain or may cause obesity and weight gain with inappropriate eating behavior.

Regarding the mediation of the attitude of mothers in the relationship between communication pattern of conversation and listening and tendentious eating behavior, the results showed that the communication pattern of conversation and listening indirectly predicts tendentious eating behavior positively and significantly (0.16), which is consistent with the results of Daniloski (2011). Daniloski (2011) believed that children who consult with their family about their meals are more likely to have healthy drinks and enjoy eating more. And this shows the proper attitude of the mother towards the child's nutrition, that with appropriate talks about nutrition, the child tends towards healthy eating behavior.

Also, the communication pattern of conformity had indirectly predicted tendency eating negatively and significantly, which is in accordance with the research of Dawnpeter et al (2013). Dawnpeter et al believed that if parents want to impose their opinion in any field, especially nutrition, the child will experience some kind of negative emotion, which will lead to inappropriate nutrition such as: bad eating, undereating and overeating. Power (2013) state that families whose communication pattern is based on conformity and homogeneity are shy and low-key people and do not have the ability to establish comfortable and appropriate communication with others, which has many negative consequences in various behaviors for the child. In this regard, based on the findings of the research, it is suggested to investigate the role of other family variables, including their education, age, and sex, on the variable of eating behavior and mother's attitude towards feeding.

**Conclusion:**

Children's nutritional behaviors depend on the family environment and the process of children's interactions with their parents. We found that mothers who have appropriate nutritional attitudes play an important role in the optimal eating behaviors of children. Also, the most important finding of the present study was the role of conversation and listening as a suitable interactive model in the relationship with children, both directly and indirectly. It has
a positive and meaningful role in the eating behavior of children through the attitude towards feeding. The interaction and relationship between parents and children, especially in the early years of childhood, when the growth and nutrition of the child is very important, can be a good foundation for the physical and mental health of children. In this regard, the present research emphasized the importance of fostering appropriate nutritional attitudes and appropriate patterns of communication with children within the family.

**Ethics Declarations**

This article is an extract from the master's thesis, which is currently one of the authors, and the ethical principles related to the approval of the thesis have been completed and accepted in Shiraz University

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