

โมเดลความสัมพันธ์เชิงสาเหตุของการจัดการภาวะอ้วนในเด็กปฐมวัยของผู้ปกครอง เขตสุขภาพที่ 4 กระทรวงสาธารณสุข A Causal Relationship Model of Childhood Obesity Management among Parents in Health Region 4, Ministry of Public Health

นิพนธ์ต้นฉบับ

Original Article

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วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2565;17(3):235-243.

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บทคัดย่อ

Abstract

วัตถุประสงค์: เพื่อทดสอบโมเดลความสัมพันธ์เชิงสาเหตุของการจัดการภาวะอ้วนในเด็กปฐมวัยของผู้ปกครองในเขตสุขภาพ 4 สังกัดกระทรวงสาธารณสุข และศึกษาอิทธิพลทางตรง และอิทธิพลทางอ้อมของปัจจัยเชิงสาเหตุของการจัดการภาวะอ้วนในเด็กปฐมวัยของผู้ปกครอง **วิธีการศึกษา:** การศึกษาเชิงปริมาณ มีกลุ่มตัวอย่างคือ ผู้ปกครองเด็กปฐมวัยอายุ 3 – 5 ปี ที่มีภาวะอ้วนตามเกณฑ์ของกระทรวงสาธารณสุขจำนวน 450 คน คัดเลือกกลุ่มตัวอย่างโดยใช้วิธีการสุ่มแบบหลายขั้นตอน รวบรวมข้อมูลโดยใช้แบบสอบถามชนิดให้กลุ่มตัวอย่างตอบเอง ลักษณะเป็นมาตราส่วนประมาณค่า 1 – 5 ตามแบบของ Likert's scale จำนวน 5 ชุดประกอบด้วย แบบสอบถามข้อมูลทั่วไป แบบวัดการจัดการภาวะอ้วนของผู้ปกครอง แบบวัดพฤติกรรมสุขภาพของผู้ปกครอง แบบวัดแรงจูงใจในการป้องกันภาวะอ้วน แบบวัดรูปแบบการเลี้ยงดูและแบบวัดการรับรู้พฤติกรรมเด็กของผู้ปกครอง วิเคราะห์ข้อมูลโดยใช้สถิติพรรณนาและการวิเคราะห์โมเดลสมการโครงสร้าง **ผลการศึกษา:** พบว่า โมเดลความสัมพันธ์เชิงสาเหตุที่ปรับปรุงมีความสอดคล้องกับข้อมูลเชิงประจักษ์ (Chi-square = 260.12, P-value = 0.78, df = 134, GFI = 0.94, AGFI = 0.91 and RMSEA = 0.046) ตัวแปรต้นทั้งหมดสามารถร่วมกันทำนายความแปรปรวนการจัดการภาวะอ้วนในเด็กปฐมวัยของผู้ปกครอง ได้ร้อยละ 94 แบบแผนพฤติกรรมสุขภาพของผู้ปกครอง แรงจูงใจในการป้องกันโรค มีอิทธิพลทั้งทางตรงและทางอ้อมโดยส่งผ่านรูปแบบการเลี้ยงดูและการรับรู้พฤติกรรมเด็กของผู้ปกครอง และรูปแบบการเลี้ยงดูมีอิทธิพลทางตรงต่อการจัดการภาวะอ้วนของผู้ปกครองสูงสุดโดยมีขนาดอิทธิพลเท่ากับ 0.84 สรุป: การป้องกันและแก้ปัญหาเด็กปฐมวัยที่มีภาวะอ้วนจำเป็นต้องอาศัยการจัดการของผู้ปกครองอย่างเหมาะสม โดยอาศัยรูปแบบการเลี้ยงดูที่สร้างความเข้าใจร่วมกันของเด็กและผู้ปกครองโดยผ่านกระบวนการจัดการในครอบครัวอย่างมีเป้าหมายและเหมาะสม

Objective: To examine the causal factors of childhood obesity management in parents for the development of a structural equation model of childhood obesity management in parents with the empirical data obtained, and to study the direct, indirect and collective influences of the causal factors affecting childhood obesity management among parents in Health Region 4, Ministry of Public Health. **Method:** In this quantitative study, a multi-stage random sampling technique was used to recruit a total of 450 parents of obese children (aged 3 - 5 years). Data were collected by using 1-5-point rating scales (Likert scales) comprising the following five parts: General data; Parents' childhood obesity management; protection motivation; parents' health behavior; parents' perception of children's behaviors and parenting styles; the data were analyzed by employing descriptive statistics and path analysis. **Results:** The final hypothesized model satisfactorily fit with the empirical data (Chi-square = 260.12, P-value = 0.78, df = 134, GFI = 0.94, AGFI = 0.91 and RMSEA = 0.046). All of the dependent variables together explained the variance of parents' childhood obesity management by 94%. Parents' health behavior, prevention motivation, parents' perception of children's behavior and parenting style also had direct and indirect effects on parents' childhood obesity management through parenting style and perception of children's behavior. Parenting style in particular had the strongest influence on parents' childhood obesity management (DE = 0.84). **Conclusion:** Preventing and solving the problem of early childhood obesity require appropriate parental management based on parenting styles that create a shared understanding of children and parents through a targeted and appropriate family management process.

คำสำคัญ: การจัดการภาวะอ้วนในเด็กปฐมวัย, รูปแบบการเลี้ยงดู, แรงจูงใจในการป้องกันภาวะอ้วน, การรับรู้พฤติกรรมเด็กของผู้ปกครอง

Keywords: childhood obesity management, parenting style, prevention motivation, perception of children behavior, parent health behavior

Editorial note

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Introduction

Early childhood obesity remains an important health issue around the world, and is one of the greatest challenges for health sectors in the 21st century. This problem continually affects low-income and middle-income countries, particularly in cities with rapid increases in high rates of obesity in early childhood around the world.^{1,2} There is an estimation of 70

million children with early childhood obesity emerging over the next 10 years. Therefore, the WHO country members endorsed a comprehensive implementation plan at the 65th World Health Assembly to manage the obesity in early childhood in order to ensure that there is no increase in

childhood obesity, which is one of the six Global Nutrition Targets 2025.³

Overweight children have 25% possibility of becoming overweight adults, 40% possibility of having diabetes mellitus, and 60 % possibility of having hypertension, which is associated with type 2 diabetes mellitus.⁴ Obesity also increases the risk of cardiovascular disease, places extra stress on the weight-bearing joints, and is associated with high incidence of liver disease and asthma. Apart from these physical effects, being overweight may have deleterious psychological effects on children such as lower self-esteem; impact on relationships with peers; and social problems.^{5,6} Furthermore, this issue may affect children's mental health, temper, and social behavior. Overweight children are more likely to have depression and bullying by friends which will impact them in the form of lost confidence in socializing with other people.⁷

The situation of the current rapid childhood obesity epidemic has led researchers in the medical, public and related fields to focus on the causes of obesity in children. According to the review of research and related literature, the factors associated with nutritional status in preschool children include both family and child factors.⁸ And according to a study of the factors related to the components of obesity in children, there are three important factors directly related to childhood obesity, namely child, family and community factors. At the family level, the following 7 factors are related: 1) Parent Modeling; 2) Parent Weight Status; 3) Home Nutrition Environment; 4) Nutrition. Knowledge; 5) Parenting Style; 6) Encouragement of Activity; 7) Parent Monitoring.⁹

The studies and literature review on family factors for the prevention of obesity in children found that solving the problem of obesity in early childhood is essentially based on family support. This is because preschool children at this age are primarily cared for within their families. In particular, the nurturing of the parents in terms of food consumption strongly affects the food consumption behavior of preschool children, because parents play an important role in directly and indirectly determining the eating behavior, habits and attitudes towards consumption of children. Parenting further influences personality traits and desirable behaviors, which in turn affects health conditions through consumption behaviors. For example, Bernard's Education¹⁰ found that forced parenting is positively associated with childhood obesity, while controlled parenting styles and strict diets affect inappropriate and

unhealthy eating behaviors. As a result, children are overweight and obese, because excessive strictness impedes and impairs self-control in eating and may encourage children to have a greater desire to eat.^{11, 12}

In addition, studies have also found that intrinsic factors of parents affect behavior modification decisions, depending on perception. Beliefs and motivations for preventing obesity among parents and the above factors influence the incidence of obesity in children.¹³⁻¹⁶ Therefore, the health behaviors of parents are also factors that influence the incidence of obesity in early childhood as well.^{17,18} However, being a good role model for family members regarding proper consumption behavior and exercise can prevent over-nutrition in preschool children.

In this study, the factors associated with the incidence of obesity in early childhood are based on the childhood obesity ecology model. Therefore, the researcher is interested in studying family factors, especially concerning the role of parents who are the child's primary caregivers, because early childhood involves limitations in self-care with inability to manage food intake and exercise on their own like adults. Parents, therefore, influence the correct health behavior model for children and play an important role in determining behavior, including children's habits and attitudes toward food consumption and physical activity. Due to the above issues, the researcher's interest is in studying the causal factors of parents' health behaviors, motivation to prevent obesity, parenting style and parental perception of child behavior that is related to parental management of obesity in early childhood. The review of related research found only research related to family management among children with thalassemia by using the self- and family management concept framework of Gray, et al.¹⁹⁻²¹ The causal relationship factor of obesity prevention motivation has not been studied. Parenting styles, parental health behavioral patterns and perceptions of children's behaviors affect the management of obesity in early childhood according to the Kanfer's Theory. The present study was aimed at finding factors that are problematic at the family level and affect the future health outcomes of children.

Drawing from the above theory and many studies, we developed a hypothesized structural model to explain the causal linkage among four predictors (Figure 1). This study aimed to test the causal relationships of the childhood obesity management of parents among parental health behavior,

prevention motivation, parenting style and perceived behavior in Health Region 4, Ministry of Public Health. Therefore, we examined the following hypotheses: a) parental health behavior could positively, directly and indirectly influence childhood obesity management of parents (H1); b) prevention motivation could positively, directly and indirectly influence the childhood obesity management of parents (H2); c) parenting style could positively and directly influence the childhood obesity management of parents (H3); d) perceived behavior could positively and directly influence the childhood obesity management of parents (H4); e) the causal relationship model of the childhood obesity management of parents is harmonious with the empirical data.

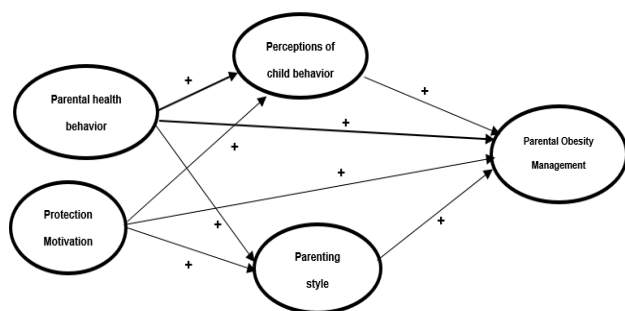


Figure 1 A hypothesized causal relationship model of parental childhood obesity management.

In this cross-sectional model-testing study, the participants were recruited by using a multi-stage random sampling technique. The sample size was a function of the approximate parameter number. Using a 20:1 aspect ratio, a sample size of 400 people was obtained to gain confidence.^{22,23} In our study, to compensate for a 10% attrition rate, a total of 450 parents of preschool children were recruited. The researcher used multi-stage random sampling where every sub-stage is randomized based on probability. The details are as follows: on pre-dispensing machine.

Methods

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used multi-stage random sampling where every sub-stage is randomized based on probability. The details are as follows:

Step 1 was stratified random sampling, which involved randomly selecting provinces in Health Region 4 based on the percentage of overweight children in early childhood at 10% and randomly selecting by lottery. We selected 4 of the 8 provinces, namely Lop Buri, Saraburi, Sing Buri and Ang Thong. We then selected 2 districts from each province, one of which was Muang District and 1 district was randomly selected in order to obtain a comprehensive sample of children with obesity in both urban and rural areas.

Step 2 was calculation of the proportional sample size. Each province was proportionate to the number of preschool children who were overweight according to the Ministry of Public Health's criteria.

Step 3: A sample was taken from the records of the sub-district health promoting hospitals in the selected district by determining the proportion based on the number of obese children in the sub-district health promoting hospitals of the selected district from the list in the family records of the sub-district health promoting hospitals. Thus, the number of parents who met the criteria set for the research was 450 people.

Inclusion and exclusion

We included parents or guardians who took care of their obese children aged 3-5 years old; obesity condition meeting the criteria set by the Ministry of Public Health; parents who voluntarily consented to participate in the research project; reading, writing and communication comprehension in the Thai language and residence in the study area during the data collection period.

Ethical considerations and data collection procedures

Ethical approval for this study was obtained from the Ethics Committee on Research in Human Subjects, Graduate School, Western University, (Ref: WTU 2563-0042) on 24 August 2020. The official letters from the Graduate School, Western University, were sent to the Provincial Public Health Offices of Saraburi, Lop-buri, Ang-thong and Sing-buri Provinces in order to get permission to carry out the research. Data collection was carried out from November 2020 to January 2021. The researchers met with the parents who met the inclusion criteria and were interested in participating in the study in order to inform them about the research objectives,

data collection process, benefits, potential risks, withdrawal from the project, and confidentiality of data collected. Written consent forms were signed by those who agreed to join the project. The data were collected by using self-administered questionnaires and approximately 15 - 20 minutes were spent in completing the data collection process.

Research instruments

A set of self-administered questionnaires was used to collect data. There were 6 parts of the questionnaires as follows:

General Data: This part was concerned with socio-demographic data in regard to age, relationship status with the obese child, educational level, and recognition that obesity is a disease.

Parental Childhood Obesity Management (PCOM): This part was developed based on the concept of Kanfer's theory²⁴ consisting of 4 indicators and 20 items measuring: goal setting (5 items); control (5 items), evaluation (5 items) and empowerment (5 items). The respondents were asked to rate their responses on 5-point Likert-type scales ranging from 1 (almost never or never true) to 5 (almost always or always true) with possible scores of 20-100 points in which higher scores indicated higher levels of PCOM. The internal consistency reliability of the part on PCOM was high with a Cronbach's alpha coefficient of 0.96.

Prevention Motivation (PM): The scale was developed based on the concept of Rogers' Theory²⁵ of Defensive Motivation: 1) perceived susceptibility; 2) perceived severity; 3) outcome expectation of results in practice (15 items); perceived susceptibility (5 items); perceived severity (5 items); and outcome expectation (5 items). The respondents were asked to rate their responses on 5-point Likert-type scales ranging from 1 (almost never or never true) to 5 (almost always or always true), with possible scores of 15-75 points in which higher scores indicated higher prevention motivation. The internal consistency reliability of the part on PMT was high with a Cronbach's alpha coefficient of 0.95.

Parental Health Behavior (PHB): This part was developed based on the concept of Backer and Maiman's Theory.²⁶ This instrument contained 5 indicators and 25 items consisting of beliefs about obese children (5 items) and parental stress (5 items), the participants were asked to complete the instrument by rating each item on 5-point Likert-

type scales ranging from 1 (strongly disagree) to 5 (strongly agree), and consumption behavior (5 items), physical activity (5 items), family interactions (5 items). The participants were asked to rate their responses on 5-point Likert-type scales ranging from 1 (almost never or never true) to 5 (almost always or always true) with possible scores of 25-125 points. Higher scores indicated higher parental health behavior. The internal consistency reliability of the parental health behavior was high with a Cronbach's alpha coefficient of 0.83.

Perceptions of Child Behavior (PCB): This part was developed based on the concept of Ajzen's Theory of Planned Change.^{27,28} This was used to assess children's perceptions of obesity by measuring the parent's perceived obesity behavioral control in their children. In this regard, parents are aware of the ability to control behavior by managing obesity in children. Parents can influence children to manage and control children's tendency to act on behaviors that cause obesity. This instrument consisted of 4 indicators and 20 items on perceived risk of food consumption (5 items), perceived barrier to control food consumption (5 items), recognizing the benefits of physical activity (5 items), and perceptions of the influence of individuals in family (5 items). The respondents were asked to complete the instrument by rating each item on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) with possible scores of 20 - 100 points. Higher scores indicated higher PCB. The internal consistency reliability of the part on PCB was high with a Cronbach's alpha coefficient of 0.89.

Parenting Style (PS): This part was developed based on the concept of Maccoby and Martin's Parenting Style Theory.²⁹ This instrument consisted of 4 indicators and 20 items with the following 4 types of parenting styles: empathic parenting (5 items), controlled parenting (5 items), indulgent parenting (5 items), and neglected parenting (5 items). The respondents were asked to complete the instrument by rating each item on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) with the possible scores of 20 - 100 points. Higher scores indicated the most likely parenting style. The internal consistency reliability of parenting style was high with a Cronbach's alpha coefficient of 0.84.

Data analysis

Descriptive statistics such as frequency, percentage, arithmetic mean and standard deviation were used to explain the demographic characteristics of the samples and all study

variables. The magnitudes of both direct and indirect effects on the childhood obesity management of parents were analyzed with structural equation modeling (SEM) to test the hypothesized model. The maximum likelihood (ML) was a method for estimating parameters. The acceptance values of goodness-of-fit (GOF) indices suggested that a minimum chi-square value [CMIN] should be non-significant (P -value > 0.05) with CMIN/degrees of freedom (df) of less than 2.0. The criteria of a goodness of fit model according to the GFI (Goodness of Fit Index) should be between 0.90 and 1.00. For the CFI (Comparative Fit Index), two values indicate the fit, specifically a value of 0.90 to less than 0.95 indicating acceptable fit while a value of 0.95 or higher indicated a good fit model. Finally, the RMSEA (Root Mean Square Error of Approximation) should be less than 0.05 to indicate that the model is close to the fit; while 0.05 to 0.08, > 0.08 to 0.10, and > 0.10 indicate perfect, moderate, and poor fit, respectively.³⁰ Data analysis was conducted by using the IBM® SPSS® (Version 22) bundled with the LISREL structural equation modeling (SEM) program. Statistical significance was set at a Type 1 error of 5% or p -value < 0.05 and type 2 error of 10% or P -value < 0.01.

Results

Characteristics of Participants: The total sample was 450 parents of children with early childhood obesity. Half of the parents were aged 26 to 50 years (50.12%) with many aged over 60 years (27.29%) and some aged under 25 years (14.54%) and a few aged between 51-60 years (8.05 %). In regard to relationship status with a child in early childhood who was obese, 6.26% were fathers, 43.85% were mothers, and 46.31% were grandparents. Approximately 63% had lower than bachelor degrees and 37.36% had finished bachelor's degree levels; 62.86% reported that 1-2 family members were obese, and 54.81% thought that obesity was not considered a disease, while 45.19 % thought that obesity was a disease. In regard to the study variables, almost all of the variables measured in the model were at a moderate level. Only the variable on PHB was at a high level. Descriptive statistics of the study variables and correlation matrix among the exogenous and endogenous variables are presented in Tables 1 and 2.

Table 1 Descriptive statistics of the study variables (N = 450).

Variable		possible Range	Actual Range	Mean	SD
Parental child Obesity management	PCOM	20-100	21-80	53.36	11.49
Parental Health behavior	PHB	25-125	43-115	76.69	10.59
Protection Motivation	PM	15-150	28-75	56.78	9.37
Parenting style	PS	20-100	27-100	68.17	14.00
Perception of child behavior	PCB	20-100	40-94	67.69	9.97

Table 2 Correlation matrix among the exogenous and endogenous variables (N = 450).

Variable		PHB	PM	PS	PB	OM
Parental Health behavior	PHB	1				
Protection Motivation	PM	.304**	1			
Parenting style	PS	.490**	.500**	1		
Perception of child behavior	PCB	.279**	.469**	.291**	1	
Parental child Obesity management	PCOM	.299**	.513**	.321**	.944**	1

Assumption testing

All data were screened prior to SEM analysis. There were no missing data, and all interval level data were normally distributed. Multicollinearity was not detected, nor were multivariate outliers observed.

Results of the model testing

First, the measurements of each variable concerning Parental Childhood Obesity Management (PCOM), Parental Health Behavior (PHB), Prevention Motivation (PM), Parenting Style (PS) and Perception of Child Behavior (PCB) were explored by using confirmatory factor analysis (CFA) for construct validity. The results show that these variables had good construct validity. Next, the hypothesized structure model was evaluated by using SEM. The initial results showed that the data did not fit well (chi-square = 2014.07, df = 161, P -value = 0.00, CFI = 0.68, GFI = 0.69, AGFI = 0.59, and RMSEA = 0.161). Therefore, model modification was undertaken by considering the conceptual and modification indices. Model trimming involved cutting serially by assessing low standardized factor loadings and non-significant parameters. Two parameters were added based on the modification indices, including the path from parental health behavior to the childhood obesity management of parents and the path from perceived behavior to the childhood obesity management of parents. The final model (Figure 2) yielded satisfactory goodness of fit indices (chi-square = 260.12, df = 134, P -value = 0.078, CFI = 0.99, GFI = 0.94, AGFI = 0.91, and RMSEA = 0.046).

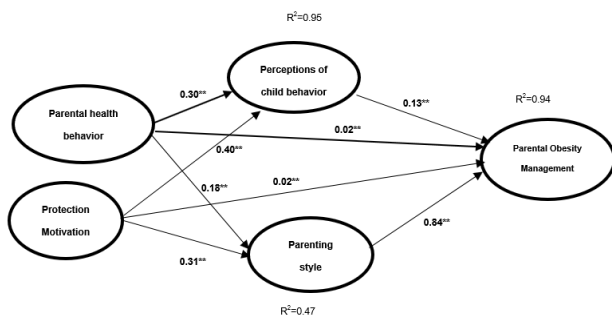


Figure 2 The final model of childhood obesity management of parents.

** *P*-value < 0.01.

Table 3 shows the direct effects of four variables on parental childhood obesity management, parental health behavior ($\beta = 0.02$, *P*-value < 0.01), prevention motivation ($\beta = 0.02$, *P*-value < 0.01), parenting style ($\beta = 0.84$, *P*-value < 0.01), perceived child behavior ($\beta = 0.13$, *P*-value < 0.01). Parenting style had the strongest effect on parental childhood obesity management ($\beta = 0.84$, *P*-value < 0.01). Perceived child behavior was also a mediating variable for parental health behavior and prevention motivation, whereas parenting style was a mediating variable for parental health behavior and prevention motivation.

Table 3 Effects of variables in the final model of childhood obesity management of parents.

Variable	Parental Health behavior			Protection Motivation			Parenting style			Perception of child behavior		
	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE
Parental child obesity management	0.02**	0.17**	0.19**	0.02**	0.30**	0.32**	0.84**	-	0.84**	0.13**	-	0.09**
Parenting style	0.16**	-	0.16**	0.31**	-	0.31**	-	-	-	-	-	-
Perception of child behavior	0.13**	-	0.13**	0.40**	-	0.40**	-	-	-	-	-	-

Note: DE=Direct effect, IE= Indirect effect, TE= Total effect

** *P*-value < 0.01.

In summary, the findings of this study support the management concept of Kanfer, which was used to describe the causal factors of parents' early childhood obesity management. The parental style factor had the highest direct and total influence on the management of obesity in early childhood. The second was parents' motivation to prevent obesity in children. All of the variables in the model were able to account for 94% of the variance in the parents' early childhood obesity management variables. Mutual understanding is required. Being a role model in parents' health behaviors and paying attention to the parent's

perception of children's behavior needs to be continuously monitored with assessment of children's weight.

Discussions and Conclusion

The present study examined causal relationship models on the childhood obesity management of parents, parental health behavior, prevention motivation, perceived behavior and parenting styles. The self-management theory guided the conceptual framework of this study.

The final model of childhood obesity management of parents shows that parenting style is strongly and positively associated with attachment, followed by the prevention motivation and parental health behavior. In addition, the direct effects of the childhood obesity management of parents on attachment were significant.

Our hypothesis that parental health behavior had direct and indirect effects on childhood obesity management was significant and confirmed. This can be interpreted that parents influence children's health behavior, because the start of child learning begins with family. The parents, who are responsible for their children, provide love, opportunities to learn lessons and instruction about the personal health behavior and habits of their children. Thus, parents are role models for the health behavior of children. In other words, the food consumption behavior and physical activities of parents are the factors that influence early childhood dietary behavior and physical activities. The study of intention for consumption behavior directly influences dietary behavior, which supports the conventional behavior theory on the ability to predict obesity prevention behavior. This is also concordant with the assumption that parental attitudes and beliefs about obesity are the factors for managing obesity with parental conditions.^{31,32} The family provides fundamental prevention and control of good dietary behavior in early childhood, because young children have limitations in managing dietary intake and exercising by themselves. Therefore, parents are role models for their children in building proper health behaviors.³³ In addition, studies show that parental role model is a key factor in early childhood obesity. Overweight mothers impact the child to be overweight also.³⁴ Therefore, parents and family members should manage and control early childhood dietary behavior by not overly indulging children and by making exercise plans. Parents are like conductors in the

health behaviors of their children in order to prevent obesity and promote good health through parental health behaviors.

The assumption that prevention motivation has direct and indirect effects on childhood obesity management of parents was significant and confirmed. This can be interpreted as a perception of disease severity and an awareness of negative impacts. Thus, children have the motivation to prevent health problems. The study explains that parents perceive the issue of early childhood obesity as a disease in which their children will have 40% risk for diabetes mellitus and 60% risk for hypertension. As a result, parents tend to have anxiety about present and future impacts on their children. Perception of disease severity is, therefore, related to disease prevention behaviors.³⁵ This is consistent with studies showing that perception of disease severity is positively related to disease prevention behaviors.^{36,37} However, parents should be supportive of their children in controlling dietary behavior, because young children cannot be responsible for themselves. Meanwhile, parents should intend to not overly indulge their children and deal with feeling sorry for their children when they are denied eating unhealthy foods or too much food, which will cause obesity.³⁸

The results show that parenting style has significant and confirmed positive effects on the childhood obesity management of parents. It can be concluded, therefore, that parenting style is one of the most important components of social transmission, because parenting style builds character and basic personal behavior leading to permanent personality. In addition, parenting style also impacts health conditions through dietary behavior in that parenting by force is positively related to childhood obesity.³⁹ Other studies have shown that mothers who restrict amounts of food and high energy foods increase the possibility of obesity in childhood than mothers who do not restrict their children's dietary behavior⁴⁰. Mothers who force, spoil, or ignore their children tend to have overweight children.⁴¹ This finding is consistent with the assumption that child nutrition is positively related to parental dietary control. Children's weights have a direct variation to indulgent parenting styles, which leads to increased unhealthy food consumption in children (Golan, 2006). Studies in undeveloped countries have shown that families who have unsustainable dietary behavior tend to use control and restriction methods, which will lead to children receiving low protein, but excessive sugar and high fat.⁴² Therefore, the

issue of obesity in early childhood is increasing in impoverished and undeveloped countries.

The perception of behavior had significant and confirmed direct effects on the childhood obesity management of parents. It can be concluded, therefore, that the perception of child behavior directly impacts childhood obesity management as the most significant factor, which is perceived benefits. This explains that the individual perception and belief that people consider the benefits of their behaviors to positively impact their health. This is also the motivation to achieve good health behavior. However, this motivation depends on the importance of the benefits, including the time spent in the process. If people perceive fewer benefits, they will not have disease prevention behavior. Thus, perceived benefits directly impact disease prevention behavior.^{43,44} The present study also shows that the perceived control of dietary behavior has significant and direct impact on intended food consumption. If parents and children perceive the problem and have plans for dietary intake and exercise together, this will promote healthy families and lead to good quality of life.

For future research, it is recommended that research and development be conducted on patterns of parenting that promote nutrition and energy equilibrium for early childhood and school age children. In addition, future studies should include public participation in the management of early childhood obesity, including research and development of management programs to prevent obesity in early childhood and school age children.

In conclusion, resolving the issue of early childhood obesity is a challenge for parents who need to apply health management for their children's good health habits under any circumstances, particularly under circumstances involving social media and convenient lifestyles. This study demonstrates that family and parenting styles are significant factors in the management of the early childhood obesity issue. Consequently, proper nutrition and energy balance methods should be promoted for parenting styles, while persuading the parents to be good role models for their children that will influence the children to be healthy adults in the future.

This study had limitations in terms of generalizability, because most participants were older parents (age > 60 years). Therefore, generalization to other age groups should be made with caution. The interpretation of causal relationships in the final model in this study must be used with

caution due to its cross-sectional design. Therefore, a longitudinal study in needs to be conducted.

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