Research Paper

Prioritizing Factors Affecting Obesity-prevention Behaviors in Preschoolers, Based on Social Cognitive Theory

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ABSTRACT

Background: The development of effective prevention and intervention programs in preschool period is an essential step in the fight against the obesity epidemic throughout life.

Objectives: This study aimed to prioritize the factors affecting the obesity prevention behaviors in 4-6 years old children from the perspective of mothers based on social cognitive theory.

Methods: This cross-sectional study was conducted on 240 children aged 4-6 years living in Behbahan City, Iran, in 2016. A random multi-stage sampling method was used in this study to recruit the samples. Data collection tools included a demographic information form and a questionnaire based on cognitive social theory (constructs of environment, outcome expectation, emotional coping, self-control, and self-efficacy), whose validity and reliability have been evaluated and confirmed (α>0.7). The questionnaire, based on cognitive social theory, included 4 obesity-prevention behaviors in children (physical activity, consumption of fruits and vegetables, consumption of sugar-free drinks, and screening) was completed by the mothers of these children. The Friedman test was used to analyze the obtained data in SPSS software, version 23.

Results: The study showed that from the mothers' point of view, the constructs of social cognitive theory affecting obesity-prevention behaviors in 4-6 years old children do not have the same priority (P<0.01). Also, considering the mean ratings obtained in this study, the "outcome expectation" construct in all 4 obesity-prevention behaviors is of primary importance. The average rankings of the "outcome expectation" construct were 4.38, 4.39, 4.25, and 4.49 in the behaviors of physical activity, consumption of fruits and vegetables, consumption of sugar-free drinks, and screening, respectively.

Conclusions: In designing maternal-centered educational interventions that prevent obesity in 4- 6 years old children, the construct of "outcome expectation" should be given the highest priority.

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Introduction

The prevalence of obesity in children around the world is increasing due to lifestyle changes and is expected to reach 70 million children by 2025 [1]. Overweight and obesity among children in Iran have become a public health concern [2-5]. In a study on 2637912 individuals aged 2-15 years, the overall prevalence of obesity in Iranian children was 11.4% [6]. The results of a study that investigated the body mass index (BMI) of under-5 children in 27 provinces of Iran in 2008 showed that the prevalence rates of overweight and obesity in children in rural and urban areas were 6.5% and 7.1%, respectively [7]. In Iran, in the last decade, the prevalence of overweight and obesity in children under 5 years of age has doubled [8]. Also, 6.7% to 10% of all 4-6 years old children living in Behbahan City, Iran, in 2016 were obese and overweight, respectively [9]. In 2010, the overall prevalence rates of obesity and overweight in primary school students in Behbahan were 9.3% and 12.1%, respectively [10].

Childhood obesity has become a global epidemic with medical, psychological, and economic consequences. Overweight and obesity can affect and reduce the quality of life of children [11, 12].

Being overweight during childhood significantly predisposes people to obesity during adulthood [11]. Research shows a close relationship between childhood and adulthood obesity because eating habits are established in the early years of life and continue for the rest of life [12]. Childhood obesity continues into adulthood, and more than 69% of 6-10 years old obese children will become obese adults [13]. In other words, the prevalence of adult obesity in obese children is 2 to 3 times that of non-obese children [5].

Overweight and obesity are largely preventable [4]. Numerous medical, social, and psychological complications of obesity in children and the heavy burden that it imposes on society highlight the need to control and prevent obesity in children [5]. Obesity is recognized as a health priority, and behavioral corrections are needed to resolve it. Changing health behaviors is the best way to reduce illness mortality and improve the quality of life [14]. The experts committee of American Medical Association (AMA) has identified four key lifestyle behaviors that prevent obesity and overweight in children and adolescents, which include replacing sugary drinks (such as artificial juices, fizzy drinks, etc.) with sugar-free drinks (such as water, yogurt drinks, natural fruit juices, and so on.), daily consumption of 5 units of fruits and vegetables, doing at least 60 minutes of physical exercise per day, and reducing sedentary activities (screen) for less than 2 hours per 60 day [15].

The family environment is the first environment that affects the obesity of children, and understanding this effect can help prevent and treat obesity [16, 17]. Parents are an important factor in changing children's behavior. There is convincing evidence that the family environment plays an important role in children's obesity-related behaviors. In a systematic review, it has been shown that the family environment is an effective factor in consuming fruits and vegetables, ready meals, soft drinks and fatty foods [18]. Another study showed the effect of direct parental support on the physical activity of children and adolescents [19]. Among family members, the role of mothers in shaping children's behavioral patterns, such as eating habits and physical activity, is crucial [19].

The cognitive social theory is one of the most efficient theories that predict and explain eating behaviors, especially in children [20]. This theory has been used successfully in examining eating behaviors such as replacing water with fizzy drinks and eating fresh fruits and vegetables [21]. The cognitive social theory is the most common theory used in childhood obesity [22].

Also, among the various behavioral predictors, the constructs of cognitive-social theory have been identified as important determinants of obesity-preventing behaviors [23].

The first important step in planning and designing intervention is problem identification. In determining a problem, it should be identified correctly because improper identification of the problem can lead to the presentation of wrong solutions [24]. According to the research, the present study is the first of its kind, and so far, no research has been done on the prioritization of constructs of cognitive social theory that affect obesity prevention behaviors in 4-6 years of children. Therefore, the present study was conducted to prioritize the constructs of social cognitive theory affecting obesity prevention behaviors in 6-4 years old children from the mothers' point of view. The findings of this study will help primary care providers and family physicians to have a prioritized framework for family education, especially mothers, in the field of obesity prevention behaviors in children. Hopefully, this study will lead to a better role for primary care doctors and improve their performance quality.

Table 1. Comparison and prioritization of social cognitive theory constructs related to physical activity behavior

Construct	Mean Rank	Rank
Environment	3.19	2
Emotional coping	2.59	3
Outcome expectation	4.38	1
Self-efficacy	2.34	5
Self-control	2.51	4

P=0.001; df=4; χ^2=288.485. Journal of Pediatrics Review

Methods

This cross-sectional study was conducted on 240 children aged 4-6 years living in Behbahan City, Iran, in 2016. A random multi-stage sampling method was used in this study. In the first stage, out of 20 kindergartens in Behbahan, 4 were randomly selected. Then, 60 children aged 4-6 years were randomly selected from each kindergarten. The sample size was calculated with 90% test power and 5% Type I error. The selected 240 children had no health problems according to the children's health records in the kindergartens. The mothers of the children completed the questionnaires after obtaining their informed consent. Data collection tools consisted of a demographic form and a questionnaire based on social cognitive theory constructs derived from the childhood health program measurement instrument designed by Adam Knowlden et al. [25]. The questionnaire based on social cognitive theory (constructs (environment, outcome expectation, emotional coping, self-control, and self-efficacy) consisted of 4 obesity-prevention behaviors in children, with 64 questions scored on a 5-point Likert-type scale from 0 to 4. This questionnaire was approved by 10 panel members specialized in health education and promotion, yielding a content validity ratio of 0.81 and a content validity index of 0.94. The validity of constructs was also assessed by factor analysis, in which the reagents selected to measure each concept had a desirable and significant factor load. To measure the reliability of the questionnaire in a preliminary study, the Cronbach α coefficient was calculated by interviewing 30 mothers. The internal correlation for each social cognitive theory construct was higher than 0.7. The data analysis was performed using the Friedman test by SPSS software, version 23.

Results

Of 240 participating children, 133(55.4%) were boys and 107(44.6%) were girls. The Mean±SD age of children was 5.13±0.68 years.

Prioritizing the constructs of social-cognitive theory related to physical activity behavior

Prioritizing the constructs of social cognitive theory related to physical activity behavior the value of Friedman test (χ^2=288.485) is significant at the error level of <0.01. It should be noted that, with a confidence interval of 0.99, there was a significant difference between the effect of constructs on the behavior of physical activity. According to the results, the average effect of the "outcome expectation" construct was 4.38, which showed the highest effect (Table 1). Also, the average effect of "self-efficacy" construct was 2.34, which showed the lowest effect among the factors affecting physical activity behavior (Table 2).

Environment emotional coping outcome expectation self-efficacy

Prioritizing the constructs of social-cognitive theory related to eating fruit and vegetable behavior

Prioritizing the constructs of social cognitive theory related to eating fruit and vegetables considering the value of the Friedman test (χ^2=511.232), which is significant at the error level of <0.01, it should be said that, with the confidence interval of 0.99, there was a significant difference between the effect of constructs on fruit and vegetable eating behavior. According to the results obtained from Table 2, the average effect of the "outcome expectation "construct was 4.39, which showed the highest effect among the factors affecting fruit and vegetable eating behavior. Also, the average "self-efficacy" construct effect was 1.91, which showed the lowest effect among the factors affecting fruit and vegetable eating behavior (Table 2).

Table 2. Comparison and prioritization of social cognitive theory constructs related to fruit and vegetable eating behavior

Construct	Mean Rank	Rank
Environment	3.97	2
Emotional coping	2.45	3
Outcome expectation	4.39	1
Self-control	2.28	4
Self-efficacy	1.91	5

P=0.001; df= 4; χ^2=511.232. Journal of Pediatrics Review

Prioritizing the constructs of social cognitive theory related to consumption of sugar-free drinks

Given the value of the Friedman test (χ^2=246.460), which is significant at the error level of <0.01, it should be noted that, with the confidence interval of 0.99, there was a significant difference between the effect of constructs on the behavior of consuming sugar-free drinks. According to the results, the average effect of the "outcome expectation" construct was 4.25, which showed the highest effect among the factors affecting the behavior of consuming sugar-free drinks (Table 3). Also, the average effect of the "self-efficacy" construct was 2.46, which showed the lowest effect among the factors affecting the behavior of consuming sugar-free drinks (Table 3).

Prioritizing the constructs of social cognitive theory related to screen behavior

Considering the value of the Friedman test (χ^2=316.137), which is significant at the error level of less than 0.01, it should be noted that, with a confidence interval of 0.99, there was a significant difference between the effect of constructs of screening behavior. According to the results obtained from Table 4, the average effect of the "outcome expectation" construct was 4.19, which showed the highest effect among the factors affecting screen behavior. Also, the average effect of the "self-efficacy" construct was 2, which showed the lowest effect among the factors affecting screen behavior (Table 4).

Discussion

Due to the increasing prevalence of childhood obesity, its prevention is desirable. According to studies, cognitive social theory constructs effectively prevent obesity behaviors [20, 21, 26-30]. So far, no study has prioritized the constructs of cognitive social theory that affect obesity-prevention behaviors in children aged 4-6 years. For health policymakers and planners, prioritizing the constructs is important because it provides the structure and guidance for designing proper interventions. Moreover, the extension and design of intervention without prioritizing influential factors leads to its failure. Ignoring need assessment leads to interventions' failure because decisions about interventions' design are directly related to critical factors. It is clear that special attention needs to be paid to identifying the factors that influence obesity prevention to avoid the consequences and costs of improper preventive interventions. The present study was conducted to answer this question: "What is the ranking and importance of social cognitive theory constructs that affect the prevention of childhood obesity from the mothers' point of view?"

Table 3. Comparison and prioritization of social cognitive construct related to the consumption of sugar-free drinks

Construct	Mean Rank	Rank
Environment	3.15	2
Emotional coping	2.48	4
Outcome expectation	4.25	1
Self-efficacy	2.46	5
Self-control	2.66	3

P=0.001; df= 4; χ^2=246.640. Journal of Pediatrics Review

Table 4. Comparison and prioritization of social cognitive theory constructs related to screening behavior

Construct	Mean Rank	Rank
Environment	3.48	2
Emotional coping	2.73	3
Outcome expectation	4.19	1
Self-efficacy	2	5
Self-control	2.61	4

P=0.001; df=4; χ^2=316.137.

Journal of Pediatrics Review

Knowing this ranking can be a practical step toward successfully implementing relevant interventions. Unsuccessful implementation of interventions is an issue that threatens the effectiveness of interventions. On the other hand, making rational and wise decisions guarantees the long-term effectiveness of interventions. Health managers should make correct decisions about obesity factors and prioritize their decisions about obesity-prevention interventions because knowing the key variables will help them better manage these variables to improve children's health. Knowledge of these key factors will increase the predictability of decisions made by healthcare managers and policymakers. Given the limitations of financial resources in health systems, especially in developing countries, it is necessary to identify the most important constructs that affect obesity prevention behaviors. The present study was conducted for this purpose, and we hope it will help planners determine the best strategies.

According to the results of the present study, from the mothers' point of view, the most important construct of social cognitive theory that affects all 4 obesity-prevention behaviors in 4-6 years old children was the "outcome expectation" construct. This finding confirms that mothers, to promote obesity prevention behaviors in their children, viewed awareness of the desired consequences of their children's involvement in these behaviors as an important factor. Therefore, to increase obesity-prevention behaviors in 4-6 years old children through the framework of social cognitive theory, adjusting the "outcome expectation" construct is the priority. By motivating mothers to understand the positive consequences of their children's obesity-prevention behaviors and creating higher-level expectations in them, mothers are more likely to take action to manage their children's obesity-related behaviors [31]. This finding is consistent with the results of Knowlden et al. [25] and Zolghadr [32] studies.

This study showed that from the mothers' point of view, in all 4 obesity prevention behaviors in children aged 4-6 years, the environment construct had the second priority. In other words, mothers consider the physical condition surrounding their children very important in preventing obesity. Therefore, to promote obesity-prevention behaviors in 4-6 years old children through the framework of social-cognitive theory, the second priority is modification of the environment construct. Consequently, mothers can develop obesity-prevention behaviors in their children by creating opportunities to overcome obstacles in real-life conditions and creating learning experiences to motivate them to continue their obesity-prevention behaviors. These findings are consistent with the results of a study by Knowlden et al. [25].

Our study showed that from the mothers' perspective, to increase the behaviors of physical activity and consumption of fruits and vegetables and reduce screening behavior in children, the constructs of "emotional coping" and "goal adjustment" have the third and fourth priority, respectively. However, to increase the behavior of consuming sugar-free drinks in children, the construct of "goal adjustment" has the third priority, and "emotional coping" is the fourth priority. Therefore, to improve the behaviors of physical activity and consumption of fruits and vegetables and reduce screening behavior in children aged 4-6 years through the framework of social cognitive theory, the construct of "emotional coping" has the third priority. In other words, mothers consider it more important for their children to manage and control the emotional and physiological states associated with performing these behaviors than to set goals and create programs to facilitate them. However, the behavior of consuming sugar-free drinks is quite the opposite. Therefore, maternal-centered interventions for preventing obesity in children aged 4-6 years must include techniques for managing children's emotional and physiological states and skills to regulate goals, monitor progress, and reinforce behavior.

According to the present study, from the mothers' point of view, the construct of "self-efficacy," which is the confidence in the ability to follow the behaviors that prevent obesity in children, had the lowest priority. In other words, mothers, to facilitate the prevention of obesity in their children, consider other constructs to be of higher priority than the construct of "self-efficacy."

It is suggested that primary care providers and family doctors educate the family, especially mothers, in the field of obesity-prevention behaviors in children based on the findings of this research.

The present study is very limitless and noticeable in many ways. This study was conducted in a small geographical area and on a relatively small number of mothers. So, the results of this study can be tested by surveying mothers in different geographical areas, and the results can be assessed. In this study, fathers could not participate, so it is suggested that they participate in other studies. The subject of the present study has a high potential for follow-up and development in future research.

Conclusion

Ignoring the issues of obesity policies and interventions is associated with an increase in the prevalence of obesity, which is at the forefront of prevention programs in terms of relevance and related complications. Reversing the rise of childhood obesity requires the development and evaluation of intervention programs. Policymakers and planners across the country play an important role in combating obesity because of their ability to create policies and programs that affect obesity prevention behaviors. When clarifying a problem, it is important to pay close attention to the indicators, measurements, and other necessary frameworks to make sure that decisions about what is being focused on as a specific problem are made consciously. This study identified and evaluated the most important factors influencing the prevention of obesity in children aged 4-6 years and showed that from the mothers' point of view, the construct of "outcome expectation" has the highest priority among the constructs of obesity-prevention behaviors in 4-6 years old children. It is hoped that by using the results of this evaluation, we will see the implementation of effective and efficient interventions and, consequently, a reduction in the prevalence of obesity in children aged 4-6 years.

Ethical Considerations

Compliance with ethical guidelines

The Research and Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran approved the study protocol (Code: IR.TUMS.REC.1394.1557).

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Authors contributions

Conceptualization and study design: Elham Nejadsadeghi; Data analysis and interpretation: Victoria Momenabadi; Statistical analysis: Maryam Zahmatkeshan. Writing the original draft: Maryam Seraji; Review and editing: Elham Nejadsadeghi.

Conflicts of interest

There is no conflict of interest to be declared.

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