

HEALTH KNOWLEDGE AND SELF-CARE BEHAVIORS FOR OBESITY PREVENTION AMONG THAI GRADE 6 STUDENTS

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Abstract

Childhood obesity remains a significant public health concern in Thailand. This cross-sectional study examined health knowledge and self-care behaviors related to obesity prevention among 150 Grade 6 students at Wat Bangplee Yai School, Samut Prakan Province. A structured questionnaire assessed three domains: health knowledge, self-care behaviors, and perceived barriers. Students demonstrated high knowledge of balanced nutrition (mean score 78%) and physical activity (74%) but low knowledge of obesity-related health risks (42%). Behavioral adherence was limited, with only 48% meeting recommended physical activity levels and 71% consuming sugar-sweetened beverages at least three times per week. Inferential analyses showed weak but significant correlations between knowledge and behaviors, including between nutrition knowledge and healthy eating ($r = 0.24$, $p = 0.006$) and between physical activity knowledge and exercise frequency ($r = 0.29$, $p = 0.002$). Knowledge of obesity risks was not associated with sugary beverage consumption ($r = -0.11$, $p = 0.18$). Chi-square analyses revealed significant associations between household income and access to healthy foods ($\chi^2 = 9.74$, $p = 0.021$) and between excessive screen time and failure to meet physical activity recommendations ($\chi^2 = 12.31$, $p = 0.004$). The study highlights a clear knowledge-behavior gap and underscores the influence of socioeconomic and environmental constraints on children's health practices. Multilevel interventions involving schools, families, and communities are essential to support sustainable obesity-preventive behaviors among Thai children.

Keywords: Childhood Obesity; Health Knowledge; Health Literacy; Self-Care Behaviors

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Introduction

Childhood obesity is a major global public health concern, with prevalence continuing to rise. The World Health Organization (WHO, 2018) reported a substantial increase in overweight and obese children aged 5 to 19 years, from 11 million in 1975 to 124 million in 2016. In Thailand, the trend is similarly concerning. A longitudinal study found childhood obesity increasing from 5.8% in 1996 to 6.7% in 2001, reflecting changes in dietary patterns and modern lifestyle behaviors among Thai children (Nonboonyawat *et al.*, 2019).

Childhood obesity is associated with both physiological and psychological consequences. Physiologically, affected children face heightened risks of metabolic syndrome, type 2 diabetes, and cardiovascular diseases that may persist into adulthood (Sahoo *et al.*, 2015). Psychologically, they may experience stigma, reduced self-esteem, and mental health issues such as anxiety and depression (Van Geel *et al.*, 2014). These challenges place long-term burdens on families, schools, and healthcare systems.

Multiple interacting factors contribute to childhood obesity. Although intrinsic contributors such as genetic predispositions and hormonal conditions, including Prader-Willi syndrome and hypothyroidism, are recognized (Lobstein *et al.*, 2015), extrinsic lifestyle-related factors play a greater role in the current obesogenic environment. High consumption of energy-dense, nutrient-poor foods and sedentary behaviors associated with prolonged screen time are major contributors to rising obesity rates (Ng *et al.*, 2014).

Addressing childhood obesity requires comprehensive strategies that integrate health literacy, supportive environments, and coordinated interventions. Health literacy, as described by Nutbeam (2000), strengthens individuals' ability to make informed health decisions and adopt healthy behaviors within their families and communities.

This study investigates health knowledge and self-care behaviors related to obesity prevention among Grade 6 students at Wat Bangplee Yai School in Samut Prakan Province, Thailand, by examining the relationships between demographic characteristics, health knowledge, and preventive behaviors. The findings support the development of targeted school-based interventions and policy recommendations that can mitigate childhood obesity and its long-term impacts.

Materials and Methods

Study Design

We employed a cross-sectional survey design to assess health knowledge and self-care behaviors related to obesity prevention among Grade 6 students. The study was conducted at Wat Bangplee Yai School in Bangplee District, Samut Prakan Province, Thailand. Data collection took place between September and October 2025.

Participants

The target population consisted of Grade 6 students aged 11 to 12 years enrolled at Wat Bangplee Yai School. A total of 150 students were selected using stratified random sampling that involved three steps. First, the complete list of Grade 6 students was obtained from the school and divided into strata based on gender and household income categories. Second, the proportion of students in each stratum was calculated to ensure that representation aligned with the actual population structure. Third, random numbers were generated using a computer-based randomization function to select participants from each stratum proportionally. This process ensured that both gender and socioeconomic groups were adequately represented in the final sample.

Sample size determination followed the Krejcie and Morgan table for an estimated population of 260 students, which indicated a minimum of 148 participants. The final sample of 150 met this requirement and provided adequate statistical power for correlation and chi-square analyses.

Instrumentation

We developed a structured questionnaire based on established frameworks of health literacy and obesity prevention (Sahoo *et al.*, 2015; Nutbeam, 2000). The instrument consisted of three sections:

1. Demographics

This section collected information on gender, age, parental education level, type of guardian, and household income.

2. Health Knowledge

Knowledge was measured in three domains: balanced nutrition, physical activity, and obesity-related health risks.

- Balanced nutrition included six items.
- Physical activity included five items.
- Obesity risks included eight items.

Each item was scored as 1 for a correct response and 0 for an incorrect response. Scores were converted to percentages and classified using established cutoffs:

- High knowledge: >75%
- Moderate knowledge: 50–75%
- Low knowledge: <50%

3. Self-Care Behaviors

This section assessed dietary habits, physical activity frequency, screen time, and stress management practices in alignment with the 3E framework, consisting of eating, exercise, and emotion. The section included 12 items rated on a four-point frequency scale ranging from *never* to *always*.

Content validity was reviewed by three public health experts. Item evaluation produced an index of item-objective congruence ranging from 0.67 to 1.00. A pilot study with 30 students of similar characteristics yielded a Cronbach's alpha of 0.87, indicating acceptable internal consistency.

Data Collection

Data were collected using self-administered questionnaires distributed during regular class sessions under researcher supervision. Clear instructions were provided, and students completed the questionnaire anonymously within approximately 30 min. To minimize social desirability bias, privacy was ensured during completion, and confidentiality was emphasized.

Data Quality Control

Control procedures were implemented throughout the data collection and analysis. Completed questionnaires were screened immediately for missing responses, inconsistent answers, and duplicate markings. Forms with incomplete sections were clarified on the same day when possible to reduce missing data. Prior to data entry, two researchers independently reviewed all questionnaires. Double data entry was performed to minimize entry errors, and discrepancies were resolved by cross-checking with the original forms. Outliers and abnormal values were examined using frequency checks before conducting statistical analyses.

Ethical approval was obtained from the Ethics Committee of Shinawatra University (Approval Code 014/2025). Written informed consent was obtained from parents or guardians, and assent was obtained from all student participants. All data were handled confidentially and used solely for research purposes.

Data Analysis

Data were analyzed using a standard statistical software package. Before analysis, datasets were screened for missing values, outliers, and entry inconsistencies as part of the data quality control process. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were used to summarize demographic characteristics, health knowledge, and self-care behaviors. Pearson correlation was applied to examine relationships between knowledge domains and behavioral variables, and chi-square tests were used to assess associations between demographic factors and self-care practices. Statistical significance was set at $p < 0.05$.

Results and Discussion

Participant Demographics

The demographic characteristics of the 150 Grade 6 participants are outlined in Table 1.

Table 1. Participant demographics

Characteristic	Frequency	Percentage (%)
Male	66	44
Female	84	56
Household income <10,000 THB	48	32
Household income 10,000–20,000 THB	72	48
Living with both parents	106	71
Living with single parent/other	44	29

Demographic data collected from all 150 participants (n = 150).

Slightly more than half of the students were female (56%). The majority of participants (71%) lived with both parents, and the remainder lived with a single parent or another guardian.

Regarding household income, 32% of the students came from families earning less than 10,000 THB per month, and 48% reported monthly incomes between 10,000 and 20,000 THB. These figures indicate that most students came from low- to lower-middle-income households. The diversity in income levels and living arrangements provides useful context for interpreting differences in health knowledge and self-care behaviors across demographic groups.

Income level showed a statistically significant association with access to healthy food ($\chi^2 = 9.74$, $p = 0.021$), highlighting the influence of

socioeconomic constraints on students' dietary opportunities.

Health Knowledge

Participants' knowledge was evaluated across three domains: balanced nutrition, physical activity, and obesity-related health risks. The findings are presented in Table 2.

Table 2. Health Knowledge Scores

Knowledge domain	Mean score (%)	High knowledge (>75%)	Moderate knowledge (50–75%)	Low knowledge (<50%)
Balanced nutrition	78	61%	27%	12%
Physical activity	74	58%	29%	13%
Health risks of obesity	42	18%	23%	59%

Mean score (%) = Average percentage of correct responses. Knowledge levels classified as high (>75%), moderate (50–75%), and low (<50%). *n* = 150 participants.

Students generally demonstrated strong knowledge in the areas of balanced nutrition and physical activity, reflected by mean scores of 78% and 74%, respectively. In contrast, knowledge of obesity-related health risks was considerably lower, with a mean score of 42% and 59% of students categorized in the low-knowledge group. This pattern highlights a clear gap in students' understanding of the long-term consequences of obesity, in contrast to their familiarity with basic nutrition and physical activity concepts.

Correlation analyses indicated weak but statistically significant relationships between nutrition knowledge and healthy eating behaviors ($r = 0.24$, $p = 0.006$) and between physical activity knowledge and exercise frequency ($r = 0.29$, $p = 0.002$). However, knowledge of obesity-related risks showed no significant association with sugar-sweetened beverage consumption ($r = -0.11$, $p = 0.18$), suggesting that awareness of long-term health consequences alone may not influence daily dietary decisions.

Self-Care Behaviors

Self-reported behaviors in dietary practices, physical activity, screen time, and stress management are presented in Table 3.

Clear differences were observed across self-care behaviors. Fruit and vegetable consumption was the most commonly practiced healthy behavior, with 62% of students meeting the recommended standard. In contrast, fewer than half met the guideline for regular physical activity, and a considerable proportion reported consuming sugar-sweetened beverages frequently. Excessive

screen time was also prevalent, reported by 64% of participants. Stress management practices were the least observed behavior, with only 28% engaging in such activities. These patterns suggest that while some healthy habits are present, several behavioral areas require further reinforcement, particularly physical activity, screen time reduction, and emotional health practices.

Excessive screen time was significantly associated with failure to meet physical activity recommendations ($\chi^2 = 12.31$, $p = 0.004$). This supports evidence that sedentary digital media exposure competes with time available for physical activity.

Table 3. Self-Care Behaviors

Behavior	Frequency (<i>n</i>)	Percentage (%)	Recommended standard met
Daily fruit and vegetable consumption	93	62	Yes
Meeting physical activity guidelines	72	48	No
Consuming sugar-sweetened beverages ($\geq 3 \times /wk$)	107	71	No
Screen time >2 h/day	96	64	No
Practicing stress management	42	28	No

Recommended standards based on national and international physical activity and dietary guidelines (e.g., WHO, 2018). *n* = 150 participants.

Barriers to Healthy Practices

Participants identified several barriers to maintaining healthy behaviors, as summarized in Table 4.

Table 4. Barriers to Healthy Practices

Barrier	Frequency (<i>n</i>)	Percentage (%)	Severity rating (1–5)
Lack of parental support	48	32	4
Limited access to healthy food options	44	29	4
Insufficient opportunities for physical activity	38	25	3

Severity rating : 1 = minimal impact, 5 = critical impact

Table 4 indicates that lack of parental support and limited access to healthy food options were the most notable barriers, each reported by nearly one third of students and rated at a severity level of

4. Insufficient opportunities for physical activity were also a frequently identified issue, with a severity rating of 3. These findings suggest that family involvement, food availability, and school or community facilities play important roles in shaping students' ability to maintain healthy behaviors.

These barriers correspond closely with socioeconomic disparities identified in earlier analyses, reinforcing the need for structural, family-centered, and community-level interventions to enable healthier choices.

Table 5. Pearson Correlation Between Health Knowledge Domains and Self-Care Behaviors

Knowledge domain	Behavioral variable	<i>r</i>	<i>p</i> -value	Interpretation
Balanced nutrition knowledge	Healthy eating behaviors	0.24	0.006	Weak positive correlation, statistically significant
Physical activity knowledge	Frequent exercise	0.29	0.002	Weak positive correlation, statistically significant
Obesity risk knowledge	Sugary beverage consumption	0.11	0.18	No significant correlation

r = Pearson correlation coefficient; *p* < 0.05 indicates statistical significance. *n* = 150 participants.

Table 5 shows that greater knowledge of balanced nutrition is correlated with healthy eating behaviors, and physical activity knowledge is positively associated with frequent exercise. Although the correlations are weak, the statistically significant findings suggest that knowledge plays a supportive but limited role in shaping health behaviors. The lack of a significant relationship between obesity risk knowledge and sugary beverage consumption indicates that awareness of long-term health consequences does not consistently influence daily behavior. These findings imply that children's actions are affected by broader contextual influences such as household routines, food availability, and social expectations. Therefore, improving knowledge alone is unlikely to produce meaningful changes without addressing these external factors.

Table 6 demonstrates that socioeconomic and lifestyle characteristics are significantly associated with the children's health practices. Students from lower-income households were more likely to report limited access to healthy foods, suggesting that economic constraints influence dietary patterns. Excessive screen time was also associated with failure to meet physical activity recommendations, indicating that time spent on digital media may

reduce opportunities for active behaviors. These findings highlight the importance of addressing environmental and structural factors that shape daily choices, since individual knowledge alone cannot fully explain or modify health behaviors among school-aged children.

In summary, our findings indicate a clear mismatch between students' health knowledge and their actual behaviors. Although participants showed adequate understanding of balanced nutrition and physical activity, this knowledge did not consistently translate into healthy daily practices. This gap suggests that individual knowledge alone is insufficient to drive sustained behavior change and that broader social, economic, and environmental factors also play substantial roles.

Knowledge–Behavior Gap

The discrepancy between knowledge and practice reflects Nutbeam's model of health literacy, which includes functional, interactive, and critical domains (Nutbeam, 2000). While students demonstrated functional literacy by recalling basic concepts, gaps remained in their ability to apply this knowledge when making daily health decisions. This pattern supports previous findings that knowledge-focused interventions alone seldom lead to behavioral improvement without supportive environments and practical skill-building opportunities (Nutbeam, 2017).

Misconceptions About Obesity Risks

Students displayed limited awareness of obesity-related health risks, consistent with earlier studies showing that children often perceive obesity primarily as a cosmetic issue (Sahoo *et al.*, 2015). Strengthening risk perception is essential, as understanding long-term consequences such as diabetes and cardiovascular diseases may encourage preventive behavior (Kropski *et al.*, 2008; Lobstein *et al.*, 2015).

Table 6. Chi-Square Associations Between Demographic Behaviors and Self-Care Behaviors

Demographic variable	Behavioral variable	χ^2	df	<i>p</i> -value	Interpretation
Household income	Access to healthy food	9.74	2	0.021	Significant association
Screen time (>2 h/day)	Failure to meet physical activity recommendations	12.31	1	0.004	Significant association

χ^2 = Chi-square test statistic; *df* = degrees of freedom; *p* < 0.05 indicates statistical significance. *n* = 150 participants.

Sedentary Behaviors and Screen Time

Excessive screen time was common among participants, reinforcing sedentary lifestyle patterns. This aligns with existing evidence that prolonged screen exposure reduces physical activity and increases susceptibility to unhealthy food marketing (Kabali *et al.*, 2015). Previous research emphasizes that reducing screen time and increasing physical activity are essential components of obesity prevention (Tremblay *et al.*, 2011; Robinson *et al.*, 2017). These findings highlight the importance of creating home and school environments that facilitate active lifestyles.

Socioeconomic Influences

Household income was significantly associated with access to healthy foods in this study, suggesting that economic constraints influence students' dietary practices. This is consistent with research showing that lower-income families may rely on cheaper, calorie-dense foods, contributing to poorer diet quality and higher obesity risk (Darmon and Drewnowski, 2008; Friel *et al.*, 2015). These findings indicate that effective interventions must address both knowledge and affordability.

Family Dynamics

Lack of parental support emerged as one of the most frequently reported barriers. This supports evidence that parental modeling plays a key role in shaping children's dietary and physical activity behaviors (Patrick and Nicklas, 2005). Interventions that involve parents and strengthen home-level support may therefore be more effective in promoting sustainable behavior change.

Practical Implications

Our results emphasize the need for multilevel interventions that address individual, family, school, and community factors, consistent with the ecological model of health behavior (Sallis *et al.*, 2015). At the school level, integrating practical health education and structured physical activity may help strengthen the application of knowledge. Family-level initiatives, such as parental workshops and household activity programs, could reinforce healthy habits at home. Community partnerships that improve access to affordable healthy foods and safe recreational spaces may help address structural barriers.

Future Directions

Future research should extend the present findings by using study designs capable of capturing long-term behavioral patterns and contextual influences among school-aged children.

Longitudinal studies are particularly important for examining how health knowledge, self-care behaviors, and perceived barriers evolve over time, and how school or community-based interventions contribute to sustained improvements.

Expanding research across multiple schools representing diverse socioeconomic contexts would help identify setting-specific challenges and inform the development of adaptable and scalable intervention models. Parental involvement could also be explored in greater depth, particularly how parental modeling, household routines, and communication influence children's health behaviors.

Research into socioeconomic support strategies, including food assistance or subsidized physical activity programs, may help determine effective approaches to reducing inequities in access to healthy lifestyles. Additionally, evaluating the use of digital tools and interactive learning platforms may provide insights into cost-effective and engaging strategies for improving health literacy and behavior tracking among children.

Mixed-methods approaches that combine quantitative measures with qualitative perspectives from students, parents, and teachers are recommended in future studies. Such designs can help capture contextual nuances that shape children's health-related decision-making and support the development of culturally relevant, practical interventions for school and community settings.

Conclusions

This study provided valuable insights into the health knowledge, behaviors, and perceived barriers among Grade 6 students in an urban Thai school. Although most students demonstrated adequate knowledge of balanced nutrition and physical activity, a clear disparity remained between their understanding and their actual practices. Suboptimal adherence to physical activity recommendations, frequent consumption of sugar-sweetened beverages, and prolonged screen time were key behavioral concerns. Barriers such as limited parental support, restricted access to healthy foods, and insufficient opportunities for physical activity further contributed to these patterns. Overall, the findings underscore the need for comprehensive, context-specific interventions that address both individual behaviors and the broader social and environmental factors influencing children's health practices.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design restricts the ability to establish causal relationships between health knowledge, behaviors, and perceived barriers. Longitudinal studies are needed to examine how these factors change over time.

Second, reliance on self-reported data may have introduced social desirability bias, particularly in reporting dietary habits and physical activity. Future research may benefit from incorporating objective measures such as activity monitors or dietary logs to improve accuracy.

Third, the study was conducted in a single urban school, which limits the generalizability of the findings to rural or suburban settings. The socioeconomic and cultural characteristics of the sample may differ from those of other regions.

Fourth, the focus on Grade 6 students provides age-specific insights but does not capture the experiences of younger or older children, who may face different challenges. Expanding research to include multiple age groups could help identify developmental differences in health behaviors.

Fifth, environmental factors, such as household food availability, community resources, and school facilities, were not assessed. These factors play important roles in shaping children's health behaviors and should be explored in future studies.

Sixth, although the sample size yielded meaningful results, a larger and more diverse sample across multiple schools would enhance the generalizability and robustness of the findings.

Finally, the results reflect the cultural context of an urban Thai school. Differences in cultural norms, dietary practices, and social expectations across regions may influence both health behaviors and the effectiveness of interventions.

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Author Contributions

Conceptualization: V.C. and P.K.; Methodology: V.C. and P.K.; Investigation: V.C. and P.K.; Data Curation: V.C. and P.K.; Formal Analysis: V.C. and P.K.; Validation: V.C. and P.K.; Writing – Original

Draft: V.C. and P.K.; Writing – Review & Editing: V.C. and P.K.; Visualization: V.C. and P.K.; Project Administration: V.C. and P.K. Both authors contributed equally to this work, with each author contributing 50%. Both authors have read and approved the final version of the manuscript.

Ethics Statement

Ethical approval for this study was obtained from the Ethics Committee of Shinawatra University (Approval Code: 014/2025). The study was conducted in accordance with relevant ethical guidelines and institutional requirements. Written informed consent was obtained from the parents or legal guardians of all participants, and assent was obtained from all student participants prior to data collection. Participation was voluntary, and all collected data were kept confidential and used solely for research purposes.

Declaration of Generative AI Use

The authors used ChatGPT, developed by OpenAI, mainly for language editing and preliminary information retrieval. The authors independently conducted the analysis, interpretation, synthesis, and conclusions. All AI-assisted content was reviewed and verified by the authors, who remain fully responsible for the manuscript.

Conflict of Interest

The authors declare that they have no conflicts of interest related to this work.

Data Availability Statement

The datasets generated and analyzed during this study are available from the corresponding author upon reasonable request.

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