

Health Beliefs Behavior and Physical Exercise Behavior Among Chinese Adolescents An Analysis of Physical Exercise Behaviors Using the Health Belief Model

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KEYWORDS ABSTRACT:

Health Belief Model, Physical Exercise Behavior, Behavioral Health Belief, Chinese Adolescents

Purpose: This study aims to examine the health beliefs influencing physical exercise behaviors among Chinese adolescents in Guangdong Province, applying the HBM to investigate the relationship between health beliefs and physical activity. Focusing on adolescents from eight cities within the province, this study assesses five HBM components in relation to their physical exercise behaviors.

Methods: This study collects data from 3,000 Chinese adolescents aged 10–19 across eight cities in Guangdong Province, China. Using the Health Belief Model (HBM), five factors were analyzed: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy, with Physical Exercise Behavior as the dependent variable.

Results: Overall, health beliefs among adolescents were neutral ($\bar{X} = 2.95$, S.D. = 0.43). Perceived Barriers scored the highest ($\bar{X} = 3.00$, S.D. = 0.44), highlighting challenges like academic pressures. Perceived Self-Efficacy ($\bar{X} = 2.99$, S.D. = 0.44) and Perceived Severity ($\bar{X} = 2.99$, S.D. = 0.43) were also relatively high, while Perceived Benefit ($\bar{X} = 2.89$, S.D. = 0.42) and Perceived Risk ($\bar{X} = 2.88$, S.D. = 0.42) were moderate to low. Physical Exercise Behavior was neutral ($\bar{X} = 2.91$, S.D. = 0.42), with adolescents showing confidence in maintaining exercise routines but less in resisting peer pressure or performing exercises correctly. Chikan District, Zhanjiang City, showed a significant correlation between health beliefs and exercise behavior ($r = 0.458$, $p < 0.001$). Regression analysis revealed health beliefs explained 64.9% of exercise behavior variance (Adjusted $R^2 = 0.644$), with Perceived Risk being the strongest predictor ($\beta = 0.799$, $p < 0.001$).

Conclusion: These findings highlight the need to enhance self-efficacy and address perceived barriers to promote physical activity among Chinese adolescents.

Introduction

Adolescence is a critical period for establishing lifelong health habits, including regular physical exercise, which plays a significant role in promoting physical, mental, and social well-being (World Health Organization [WHO], 2020). Physical activity during adolescence can help prevent various health issues, such as obesity, cardiovascular diseases, and mental health disorders, and contributes to improved academic performance and emotional resilience (Janssen & LeBlanc, 2010). However, recent data show a global decline in physical activity levels among adolescents, with many failing to meet the WHO's recommended 60 minutes of daily moderate-to-vigorous physical activity (WHO, 2020). In China, this trend is pronounced, particularly in urban areas, where academic pressures, limited access to recreational spaces, and lifestyle shifts contribute to sedentary behavior among young people (Zhu et al., 2017).

To understand the factors influencing physical activity among adolescents, researchers frequently apply behavioral models, such as the Health Belief Model (HBM). Developed by Rosenstock (1974), the HBM provides a theoretical framework to examine health-related behaviors, proposing that individuals' decisions to engage in these behaviors are influenced by their perceptions of health risks and benefits, perceived barriers to action, and their confidence in successfully performing the behavior (Glanz et al., 2008). The model consists of five main components: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy. Research indicates that each component can significantly impact health behaviors, with Perceived Self-Efficacy and Perceived Benefits often emerging as strong predictors of physical activity engagement (Plotnikoff et al., 2015; Wallace et al., 2020). Applying the HBM allows for a deeper understanding of the psychological and perceptual factors that may either encourage or discourage

adolescents from engaging in regular physical activity, particularly in diverse sociocultural contexts (Jones et al., 2015).

Although the HBM has been widely applied in studies on health behavior across various populations, research specifically examining Chinese adolescents' health beliefs and exercise behaviors is limited. Guangdong Province, one of China's most economically developed regions, presents a unique context for such research. Rapid urbanization, combined with intense academic demands, has contributed to changing lifestyles among adolescents in Guangdong, where high-stakes educational environments may deprioritize physical activity (Wang et al., 2020). Studies in Western countries suggest that factors like Perceived Barriers and Perceived Self-Efficacy can significantly influence adolescent exercise behaviors, but few studies have focused on how these factors manifest among Chinese adolescents in Guangdong. Understanding the influence of these health beliefs could be instrumental in designing interventions tailored to this specific population.

This study aims to examine the health beliefs influencing physical exercise behaviors among Chinese adolescents in Guangdong Province, applying the HBM to investigate the relationship between health beliefs and physical activity. Focusing on adolescents from eight cities within the province, this study assesses five HBM components in relation to their physical exercise behaviors. Specifically, this study addresses the following research questions: (1) To what extent do health beliefs predict physical exercise behaviors among Chinese adolescents? (2) Are there significant differences in health beliefs and exercise behaviors across different cities within Guangdong Province?

This research contributes to the literature by providing insights into the psychological and environmental factors that shape physical activity behaviors in a culturally and regionally specific context. Findings from this study may inform public health initiatives and school-based programs aimed at promoting physical activity among adolescents in China, particularly in urbanized regions where academic pressures are high. Moreover, identifying variations across cities within Guangdong may highlight specific areas for targeted interventions, addressing barriers and enhancing support for physical activity where it is most needed.

Literature Review

Understanding factors that shape adolescent physical exercise behavior is vital for designing effective health interventions. This study uses the Health Belief Model (HBM) to explore how Behavioral Health Belief as the independent variable influences Physical Exercise Behavior as the dependent variable. Behavioral Health Belief encompasses perceptions of Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Self-Efficacy. Adolescents with higher Behavioral Health Belief, marked by strong perceptions of risk, severity, and benefit, and high self-efficacy, are more likely to engage in regular physical activity, while those with greater perceived barriers may be less likely to participate. This study examines how these health beliefs collectively influence adolescents' physical exercise habits.

Health Belief Model

The Health Belief Model posits that individuals are more likely to engage in health-promoting behaviors based on their beliefs about health risks, perceived severity of those risks, the benefits of taking preventive action, the barriers to acting, and their self-efficacy in performing the behavior (Glanz et al., 2008). This model is particularly relevant to physical exercise, as it can help explain why adolescents may choose to engage in physical activity or avoid it despite its well-known benefits. The HBM's primary constructs, Perceived Risk (Susceptibility), Perceived Severity, Perceived Benefit, Perceived Barriers, and Self-Efficacy provide insight into the psychological factors that influence exercise behavior.

1. Perceived Risk

Perceived Risk refers to an individual's belief about the likelihood of developing a health problem. For adolescents, perceived risk might include the likelihood of experiencing obesity, heart disease, or other chronic health conditions due to inactivity (Rosenstock, 1974). Studies indicate that adolescents who feel at risk are more likely to engage in preventive behaviors, including physical activity (Plotnikoff et al., 2015). However, research suggests that many adolescents perceive

themselves as invulnerable to health risks, which may diminish their motivation to exercise (Berli et al., 2014).

2. Perceived Severity

Perceived Severity involves an individual's assessment of the seriousness of the health issue and its potential consequences. For adolescents, understanding the severe, long-term consequences of physical inactivity, such as chronic diseases and mental health issues, can motivate them to engage in physical activity (Glanz et al., 2008). However, studies reveal that adolescents may not fully appreciate the severity of health risks due to a focus on immediate concerns rather than future consequences (Wallace et al., 2020). In Chinese contexts, where academic success is highly valued, adolescents may deprioritize health risks in favor of educational and social expectations (Wang et al., 2020).

3. Perceived Benefit

Perceived Benefit is the belief in the advantages of engaging in a health behavior. For physical activity, benefits might include improved physical fitness, enhanced mental health, social interaction, and stress relief (Kumar et al., 2015). Adolescents who perceive substantial benefits from exercise are more likely to participate in physical activities, particularly if these benefits align with their personal or social goals (Wallace et al., 2020). In Chinese culture, however, the perceived benefits of exercise may be secondary to academic achievements, as family and school pressures can limit the emphasis placed on regular physical activity (Wang et al., 2020).

4. Perceived Barriers

Perceived Barriers refer to the obstacles that individuals believe might prevent them from engaging in a health behavior. For adolescents, common barriers to physical exercise include time constraints, lack of access to facilities, academic pressures, and insufficient family support (Hohepa et al., 2006). In urban areas of China, such as Guangdong Province, these barriers can be particularly pronounced due to high academic demands and limited recreational spaces (Li et al., 2016; Wang et al., 2020).

5. Perceived Self-Efficacy

Perceived Self-Efficacy, introduced to the HBM by Bandura (1986), is an individual's confidence in their ability to perform a specific behavior successfully. Adolescents with high self-efficacy for physical activity are more likely to overcome obstacles, such as time constraints or social pressures, to engage in regular exercise (Dishman et al., 2009). Among Chinese adolescents, self-efficacy is influenced by family support and societal expectations. Fan et al. (2019) found that adolescents who receive encouragement from family or school are more likely to have high self-efficacy and engage in physical activity.

Behavioral Health Belief

Behavioral Health Belief integrates the various perceptions adolescents hold about health-related risks, benefits, barriers, and self-efficacy. This concept, grounded in the Health Belief Model (HBM), provides a comprehensive understanding of the factors influencing adolescents' motivation to adopt or avoid health-promoting behaviors such as physical exercise (Glanz et al., 2008). Adolescents with strong Behavioral Health Beliefs are generally more inclined to engage in physical activity, especially when they perceive exercise to have significant health benefits, minimal barriers, and when they feel confident in their ability to maintain an exercise routine. These beliefs are shaped by individual perceptions and are also influenced by cultural and environmental factors that impact adolescents' health decisions.

In Chinese society, where academic success is highly prioritized, adolescents may view time spent on physical activity as conflicting with academic responsibilities. The focus on academic achievements can elevate perceived barriers to exercise, as adolescents often feel pressured to allocate their time toward studying rather than physical activities (Zhu et al., 2017). Additionally, limited access to recreational spaces in urban areas like Guangdong Province restricts opportunities for physical activity, further reinforcing perceived barriers (Li et al., 2016). These cultural and structural factors play a significant role in shaping the Behavioral Health Belief of Chinese adolescents, who

may understand the importance of physical activity but feel constrained by their environment and societal expectations.

Supportive environments, particularly encouragement from family and schools, can enhance adolescents' self-efficacy, or their belief in their ability to engage in regular physical exercise. Research indicates that adolescents with strong family support are more likely to overcome perceived barriers and prioritize health-promoting activities like exercise (Ren et al., 2020). By strengthening self-efficacy and providing a supportive environment, family and community resources can positively shape Behavioral Health Belief. Addressing both cognitive and environmental aspects in interventions can help create conditions where adolescents feel empowered and motivated to include physical activity in their daily lives, supporting long-term health outcomes.

Physical Exercise Behavior

Physical Exercise Behavior refers to the actual level of engagement in physical activity, which is essential for adolescent health and the prevention of chronic diseases. According to the HBM, physical exercise behavior is influenced by various factors, including an individual's health beliefs, perceived barriers, and self-efficacy (Rosenstock, 1974). Regular physical activity is particularly important for adolescents, as it not only supports physical health but also has positive effects on mental well-being, including reduced stress, improved mood, and enhanced social connections (Smith & Biddle, 2008). However, physical exercise behavior among adolescents is often inconsistent, with participation levels shaped by personal beliefs, cultural factors, and access to resources.

In regions like Guangdong, where academic pressure is substantial, adolescents often face challenges in balancing study obligations with exercise. This academic focus can lead to sedentary lifestyles, as adolescents may perceive limited time for exercise due to their study commitments (Zhu et al., 2017). Additionally, urbanization has limited the availability of recreational spaces, creating an environment that does not support active lifestyles. Without accessible facilities, physical activity becomes less integrated into daily routines, further decreasing exercise participation among adolescents (Li et al., 2016). These cultural and environmental constraints present significant challenges to increasing physical exercise behavior, even among adolescents who may understand the benefits of regular activity.

Effective interventions that promote physical exercise behavior among adolescents must consider these structural and cultural barriers. Programs that integrate physical activity within the school day, improve access to recreational facilities, and encourage family involvement can provide the support adolescents need to engage in regular physical activity (Wang et al., 2020). By enhancing self-efficacy and reducing perceived barriers, these initiatives align with the HBM and offer a foundation for fostering healthier exercise habits among adolescents. A comprehensive approach that addresses both cognitive beliefs and environmental factors is essential for promoting sustained physical activity, ultimately contributing to improved long-term health for adolescents.

Research Methodology

This study utilized a cross-sectional survey design to explore the relationship between health beliefs and physical exercise behaviors among Chinese adolescents. The Health Belief Model (HBM) framework guided the measurement of key health belief components: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy, alongside physical exercise behavior as the dependent variable. Cross-sectional data collection enabled an in-depth analysis of health beliefs and exercise behaviors within a specific population segment at one point in time, aligning with the study's objective to identify associations between health beliefs and physical activity in this demographic.

Population and Sample

The study population consisted of Chinese adolescents aged 10 to 19 from eight cities within Guangdong Province, China. A total of 3,000 adolescents participated, with 375 respondents selected from each of the following cities: Tianhe District in Guangzhou City, Shatian Town in Dongguan City, Shunde District in Foshan City, Dong District in Zhongshan City, Chikan District in Zhanjiang City, Pingyuan County in Meizhou City, Xiangqiao District in Chaozhou City, and Wujiang District in

Shaoguan City. The sample size of 3,000 (375 adolescents per city) was selected to ensure a diverse and representative sample of urban and suburban adolescents within Guangdong Province.

Participants were recruited through schools within each district following approval from relevant educational authorities. Convenience sampling was employed to select students within the age range, ensuring a balanced distribution of male and female participants. Parental consent was obtained for all participants under the age of 18, and informed consent was acquired from participants themselves. Anonymity and confidentiality of all responses were maintained to ensure data integrity and participant privacy.

Instrumentation

Data collection was conducted using a structured questionnaire, designed to assess each component of the HBM as well as physical exercise behavior. The questionnaire was developed based on validated HBM scales and tailored to suit the context of adolescent physical activity in China. The instrument comprised five sections corresponding to the HBM components, plus a section on physical exercise behavior:

1. Perceived Risk: Items measured adolescents' beliefs about their susceptibility to health risks associated with physical inactivity (e.g., likelihood of developing obesity or chronic diseases).

2. Perceived Severity: Items assessed the perceived seriousness of health consequences related to a lack of exercise.

3. Perceived Benefit: This section gauged beliefs about the advantages of engaging in physical activity, including health, social, and mental benefits.

Perceived Barriers: Items measured perceived obstacles to engaging in regular exercise, such as time constraints, academic pressures, and access to recreational facilities.

4. Perceived Self-Efficacy: This component evaluated adolescents' confidence in their ability to exercise regularly and overcome challenges related to physical activity.

5. Physical Exercise Behavior: The dependent variable section assessed the frequency, duration, and types of physical activities undertaken by participants.

Each item was rated on a 5 -point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), allowing for quantitative analysis of responses. Higher scores indicated stronger perceptions or engagement in each component.

Data Collection Procedure

Data were collected in a classroom setting within each participating school over a period of one month. Trained research assistants administered the questionnaires, providing instructions and addressing any questions to ensure understanding. Each participant completed the survey in approximately 20 minutes, with research assistants available to clarify survey items as needed, reducing potential response bias due to misunderstanding.

Ethical approval for the study, titled Effects of Health Belief Model with Exercising Program on Physical Exercise Behaviors Among Adolescents, was obtained from the Mahasarakham University Research Ethics Committee on February 7, 2024, with the ethics approval number 073-044/2024. The study adhered to strict ethical guidelines for conducting research with minors, including obtaining parental consent for participants under 18 and informed consent from all participants. Anonymity and confidentiality of all responses were strictly maintained to ensure participant privacy, with completed questionnaires securely stored to prevent unauthorized access.

Throughout the research process, ethical considerations were continuously monitored and reviewed to ensure participants' rights and well-being were safeguarded. This ongoing commitment to ethical standards guided the entire research process, from data collection to reporting, with an emphasis on conducting a study that is respectful, responsible, and beneficial to Chinese adolescents in Guangdong Province.

Data Analysis

Data analysis was conducted using SPSS (Statistical Package for the Social Sciences) version 26. Descriptive statistics, including means and standard deviations, were calculated for each HBM

component and physical exercise behavior to provide an overview of the sample's health beliefs and activity levels.

To assess relationships between health beliefs and physical exercise behavior, correlation analysis was performed, with a particular focus on significant relationships between HBM components and exercise behavior. Multiple regression analysis was then conducted to determine the predictive power of each HBM component on physical exercise behavior, allowing for an examination of which health beliefs most significantly influenced physical activity among adolescents.

The regression model included all five HBM components as independent variables and physical exercise behavior as the dependent variable. The adjusted R^2 value was calculated to determine the proportion of variance in physical exercise behavior explained by the model. Regression coefficients (b), standardized beta coefficients (β), and significance levels (p-values) were examined to identify the strongest predictors of exercise behavior.

For city-specific analysis, additional correlation analyses were conducted to identify any significant differences in health beliefs and exercise behaviors among adolescents in each of the eight cities. These analyses aimed to identify potential regional influences on health beliefs and physical activity, contributing to a more nuanced understanding of adolescent exercise behavior within Guangdong Province.

Results

This study investigated the health belief patterns influencing physical exercise behaviors among Chinese adolescents aged 10-19 across eight cities in Guangdong Province, with a total of 3,000 participants (375 from each city). Using the Health Belief Model (HBM) framework, the study examined five components: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy, alongside Physical Exercise Behavior as the dependent variable.

Behavioral Health Belief

Behavioral Health Belief among Chinese adolescents was assessed using descriptive statistics, specifically mean ($\bar{X}$) and standard deviation (S.D.), to analyze their attitudes toward various health beliefs related to physical activity. This analysis covers five components of the Health Belief Model: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy, along with an overall Behavioral Health Belief score.

Table 1: Behavioral Health Belief Among Adolescents

Behavioral Health Belief	$\bar{X}$	S.D.	Meaning
Perceived Barriers	3.00	0.44	Neutral
Perceived Self-efficacy	2.99	0.44	Neutral
Perceived Severity	2.99	0.43	Neutral
Perceived Benefit	2.89	0.42	Neutral
Perceived Risk	2.88	0.42	Neutral
Overall	2.95	0.43	Neutral

Behavioral Health Belief score was neutral ($\bar{X} = 2.95$, S.D. = 0.43), suggesting moderate attitudes toward health beliefs associated with physical exercise. Perceived Barriers scored the highest ($\bar{X} = 3.00$, S.D. = 0.44), indicating that academic and personal pressures are perceived as major obstacles to physical activity. Perceived Self-Efficacy and Perceived Severity also scored relatively high, reflecting a moderate level of confidence in the ability to exercise and an awareness of potential health risks. In contrast, Perceived Benefit and Perceived Risk had lower scores, suggesting a neutral view of exercise benefits and a low perception of health risks from inactivity.

Physical Exercise Behavior

Physical Exercise Behavior was analyzed to provide an overview of adolescents' engagement in maintaining a regular exercise routine. Descriptive statistics, specifically mean ($\bar{X}$) and standard deviation (S.D.), were used to evaluate overall engagement.

Table 2:Physical Exercise Behavior Among Adolescents

Physical Exercise Behavior	$\bar{X}$	S.D.	Meaning
Overall	2.95	0.43	Neutral

Physical Exercise Behavior score was neutral ($\bar{X} = 2.91$, S.D. = 0.42), indicating a moderate level of engagement among adolescents. This suggests that while adolescents participate in physical activities to some extent, their commitment is neither particularly high nor low, highlighting potential areas for improvement to foster more consistent exercise behaviors.

City-Level Analysis

City-Level Analysis explores the relationship between Behavioral Health Belief and Physical Exercise Behavior among adolescents across eight cities in Guangdong Province, China. Using Pearson's correlation coefficient (r), this analysis examines the strength and significance of the association between health beliefs and exercise behavior in each city, with p-values indicating significance levels ($p \leq 0.001$ as **).

Table 3:City-Level Analysis of Behavioral Health Belief and Exercise Behavior

City	Factor	$\bar{X}$	S.D.	r	p	Meaning
Tianhe District,	Behavioral Health Belief	2.96	0.42	0.042	0.419	Not
Guangzhou City	Physical Exercise Behavior	2.89	0.42			Related
Shatian Town,	Behavioral Health Belief	2.95	0.45	0.031	0.554	Not
Dongguan City	Physical Exercise Behavior	2.91	0.43			Related
Shunde District,	Behavioral Health Belief	2.96	0.43	0.052	0.311	Not
Foshan City	Physical Exercise Behavior	2.89	0.41			Related
Dong District,	Behavioral Health Belief	2.96	0.43	0.052	0.315	Not
Zhongshan City	Physical Exercise Behavior	2.91	0.45			Related
Chikan District,	Behavioral Health Belief	2.95	0.21	0.458	0.000**	Related
Zhanjiang City	Physical Exercise Behavior	2.94	0.45			
Pingyuan County,	Behavioral Health Belief	2.93	0.44	0.054	0.299	Not
Meizhou City	Physical Exercise Behavior	2.95	0.43			Related
Xiangqiao District,	Behavioral Health Belief	2.96	0.41	0.032	0.536	Not
Chaozhou City	Physical Exercise Behavior	2.88	0.40			Related
Wujiang District,	Behavioral Health Belief	2.95	0.44	0.033	0.519	Not
Shaoguan City	Physical Exercise Behavior	2.93	0.44			Related
Overall	Behavioral Health Belief	2.88	0.42	0.552	0.011	Not
	Physical Exercise Behavior	2.91	0.42			Related

City-Level Analysis provides insights into the relationship between Behavioral Health Belief and Physical Exercise Behavior across eight cities in Guangdong Province, China, focusing on adolescents' exercise patterns. The data reveals that Chikan District, Zhanjiang City shows a statistically significant positive correlation ($r = 0.458$, $p < 0.001$), indicating that adolescents in Chikan District with stronger health beliefs are more likely to engage in regular physical exercise. This significant relationship suggests that health beliefs are a key motivating factor for physical activity in this area, highlighting the potential impact of targeted interventions to strengthen health beliefs and increase exercise engagement. In contrast, other cities show no statistically significant correlation, implying that health beliefs may play a less prominent role in influencing exercise behavior in these areas.

The following Regression Analysis focuses on Chikan District, Zhanjiang City, selected due to its significant correlation between Behavioral Health Belief and Physical Exercise Behavior, highlighting a strong association in this area compared to other cities. This analysis utilizes multiple regression to examine the predictive influence of five components of Behavioral Health Belief: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy on adolescents' physical exercise behavior. The table presents unstandardized coefficients

(b), standardized coefficients (β), t-values, and p-values, demonstrating the significance and impact of each predictor variable on physical exercise behavior.

Table 4:Behavioral Health Belief Among Adolescents in Chikan District, Zhanjiang City

Behavioral Health Belief	b	SE _b	β	t	p
(Constant)	.541	.192		2.815	.005
Perceived Risk	.804	.032	.799	25.130	.000**
Perceived Severity	.017	.033	.017	.530	.597
Perceived Benefit	.002	.033	.001	.047	.963
Perceived Barriers	-.018	.032	-.017	-.559	.576
Perceived Self-efficacy	.022	.030	.023	.731	.465
Constant= .541, SE _{cst} = .269, R = .805, R ² = .649, Adjusted R ² = .644, F = 136.349, p = .000					

Behavioral Health Belief Among Adolescents in Chikan District, Zhanjiang City reveals that health belief variables collectively explain 64.9 % of the variance in physical exercise behavior (Adjusted R² = 0.644), indicating a substantial impact. Within these variables, Perceived Risk emerges as the strongest predictor of physical exercise behavior ($b = 0.804$, $\beta = 0.799$, $t = 25.130$, $p < 0.001$), suggesting that adolescents who recognize higher risks associated with inactivity are more inclined to engage in regular physical activity. In contrast, Perceived Barriers and Perceived Self-Efficacy exhibit minor influence ($b = -0.018$, $\beta = -0.017$, $p = 0.576$; $b = 0.022$, $\beta = 0.023$, $p = 0.465$, respectively), indicating that while these factors contribute to understanding exercise behavior, their effects are not statistically significant in this context.

Based on the regression analysis conducted for adolescents in Chikan District, Zhanjiang City, the following equation was derived:

$$\text{Physical Exercise Behavior} = 0.541 + (0.804 \times \text{Perceived Risk})$$

This equation reflects the significant predictive power of Perceived Risk in determining physical exercise behavior. The positive coefficient of 0.804 for Perceived Risk indicates that adolescents in Chikan District, Zhanjiang City, who perceive higher health risks associated with physical inactivity are more likely to engage in regular physical exercise.

Discussion

This study investigates how health beliefs influence physical exercise behaviors among Chinese adolescents in Guangdong Province, applying the Health Belief Model (HBM). It specifically examines the relationship between five key components of the HBM: Perceived Risk, Perceived Severity, Perceived Benefit, Perceived Barriers, and Perceived Self-Efficacy with physical exercise behaviors. The study also explores variations in health beliefs and physical activity across eight cities within the province. The results highlight significant findings, particularly in Chikan District, Zhanjiang City, where health beliefs strongly correlate with exercise behavior.

Behavioral Health Belief

The findings reveal that adolescents' Behavioral Health Belief, shaped by their perceptions of risk, severity, benefits, barriers, and self-efficacy, plays a significant role in determining physical exercise behavior. Perceived Risk emerged as the strongest predictor, with adolescents who recognized higher risks associated with inactivity more likely to engage in physical exercise. This aligns with research by Plotnikoff et al. (2015), who found that higher perceived risk of health issues due to inactivity is associated with increased engagement in physical activity. Similarly, Berli et al. (2014) demonstrated that adolescents who perceive higher health risks from physical inactivity are more likely to participate in physical exercise to mitigate those risks.

While Perceived Barriers and Perceived Self-Efficacy were identified as important factors, they had a less significant impact in this study. Research by Ren et al. (2020) suggests that self-efficacy influences exercise behavior, yet the impact can vary across different cultural and

environmental contexts. In this study, the moderate effect of self-efficacy could be attributed to the external pressures faced by Chinese adolescents, particularly academic pressures, as highlighted by Wang et al. (2020). In their study, adolescents in China often prioritize academic achievement, which can diminish the influence of self-efficacy related to physical activity.

Physical Exercise Behavior

The study finds that physical exercise behavior among adolescents is influenced by their Behavioral Health Belief, but overall, the level of physical activity was neutral. Adolescents showed higher confidence in maintaining an exercise routine and finding time for exercise but struggled with overcoming peer pressure and performing exercises correctly. This finding resonates with Li et al. (2016), who found that adolescents' engagement in physical activity can be impacted by external social factors, such as peer influences, which can either encourage or discourage exercise. In this study, while adolescents recognized the importance of exercise, barriers such as social pressure and lack of guidance hindered consistent engagement in physical activity.

Further studies by Hohepa et al. (2006) have also pointed out that adolescents commonly experience barriers, such as a lack of time and limited access to facilities, which can prevent them from participating in physical activities, despite recognizing the health benefits. Ferreira Silva et al. (2022) also support this view, highlighting that Chinese adolescents in urban settings often face barriers like academic pressures and limited access to recreational spaces, which significantly limit their physical activity levels. Therefore, interventions aimed at improving physical activity among adolescents should focus on reducing these barriers, while also boosting self-efficacy and providing more support in overcoming social challenges related to exercise.

City-Level Analysis

The City-Level Analysis revealed significant regional variations in how health beliefs influence physical exercise behavior. Chikan District, Zhanjiang City showed the strongest correlation between health beliefs and physical activity, with Perceived Risk being the most significant factor. This is in line with Rosenstock's (1974) Health Belief Model, which emphasizes that individuals who perceive higher health risks are more likely to engage in health-promoting behaviors. Similarly, Plotnikoff et al. (2015) and Wang et al. (2020) found that adolescents in regions where health risks are perceived more strongly are more likely to engage in physical activity to mitigate those risks. This suggests that strengthening health beliefs in Chikan District, Zhanjiang City could lead to more effective physical activity promotion interventions.

In contrast, other cities in Guangdong did not show statistically significant correlations between Behavioral Health Belief and physical exercise behavior. This lack of correlation highlights the complexity of exercise behavior and suggests that health beliefs alone may not be sufficient to drive physical activity. Li et al. (2016) and Wang et al. (2020) have noted that adolescents' physical activity is also influenced by structural factors such as access to recreational facilities and social influences. Therefore, in cities where health beliefs are weaker predictors of exercise, interventions must address broader structural barriers, such as providing more opportunities for exercise and reducing academic pressures.

Conclusion

This study examined the relationship between health beliefs and physical exercise behaviors among Chinese adolescents in Guangdong Province, applying the Health Belief Model (HBM). The findings reveal that Perceived Risk is the strongest predictor of physical exercise behavior, with adolescents who perceive higher risks associated with inactivity being more likely to engage in physical activity. While Perceived Barriers and Perceived Self-Efficacy also play a role, their impact is less significant, highlighting the importance of addressing external factors such as academic pressures and limited access to exercise facilities. The City-Level Analysis showed significant regional variations, with Chikan District, Zhanjiang City demonstrating a stronger correlation between health beliefs and physical activity, suggesting that interventions focusing on strengthening health beliefs could be particularly effective in this area. In contrast, other cities showed weaker correlations, indicating that a more comprehensive approach is needed in those regions to tackle structural barriers. Overall, the study underscores the importance of both cognitive health beliefs and environmental

factors in promoting physical activity among adolescents and suggests that interventions tailored to specific regional contexts could be more effective in improving exercise behaviors.

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