

Leveraging School Health Programmes (SHP) to Drive Behavioral Change: A TPB-Based Study of Student Health Outcomes in Pakistan

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Abstract

This research explores the Theory of Planned Behavior (TPB) to investigate how School Health Programmes (SHP) affect behavioral change among students and drive healthy attitudes. Emphasizing that health education and awareness are key in developing healthy lifestyles and the prevention of disease, and SHPs are a vehicle to inculcate such behavior at an early age. Adopting healthy conduct requires timely awareness, and this study focuses on the potential of SHPs to transform student behavior in the long term. The study utilizes a cross-sectional empirical design with data gathered from 550 public school students of the Punjab region, both control and treatment groups, are utilized. PLS-SEM is applied to evaluate model fitness and relationships, followed by Multi-group Analysis in Smart PLS to evaluate differences across data groups. The results indicate that the treatment group exhibited significantly higher positive health behaviors than the control group, validating the use of TPB. Additionally, SHPs were found to have a significant long-term effect on behavior change. These findings highlight the importance & efficacy of long-term health programmes in education settings, especially in a developing country like Pakistan. In a practical context, the research provides a strategic model for policymakers to improve SHP design and implementation. Overall, the study stresses the need to foster healthier physical and social environments to facilitate long-term behavioral change among students and promote healthy lifestyles for better living.

Keywords: Health Education, School Health Program, Theory of Planned Behavior.

Introduction

Living a healthy lifestyle is not only vital for preventing chronic diseases and long-term illnesses, but good health is central to human happiness and well-being, contributing significantly to prosperity, wealth, learning, and even economic progress (WHO, 2024; UNICEF, 2024). Further, it is acknowledged globally as a primary Sustainable Development Goal (SDG 3: Good Health and Well-Being) since health is fundamental to people's capacity to learn, earn a living, and engage fully in society. Poor health reduces global GDP by 15% annually due to lost productivity and healthcare costs (World Bank, 2022). It is essential to achieve sustainable economic growth, lessen inequality, and ensure overall development progress (UN, 2024; World Bank, 2025). Investing in school health and nutrition is one of the most cost-effective strategies for improving health and education outcomes in children, particularly in low- and middle-income countries (Aldahnaim et al., 2023; WHO, 2023; UNICEF, 2023). Adopting health-promoting actions is essential for maintaining a healthy lifestyle and health education and awareness can significantly promote healthy behaviors

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(Abdul et al., 2024; Schere et al., 2023). Particularly, developing health-oriented attitudes in children is even more pivotal as it is a time of rapid growth, development, and activity (Almas et al., 2023; WHO, 2023). Healthy children are 25% more likely to attend school regularly and perform better academically (WHO, 2022), and, contribute to long-term economic and social progress (UNICEF, 2023; DallaCosta et al., 2023).

School health programs (SHP), initially launched in the developed world due to the link between health and learning, are now widely adopted by developing nations to improve education and societal well-being. (Schere et al., 2023; Silva et al., 2021). It is noticed that investing \$1 in school health and nutrition yields up to \$9 in lifetime productivity gains (UNESCO & WFP, 2022). Effective school health programming help students learn and acquire the skills to make informed decisions, engage in healthy behaviors, and create healthy settings (Bull et al., 2020). Research shows early health education is crucial since it forms kids' habits throughout their academic careers (DallaCosta; 2023; Eckelman et al., 2020). Regarding SHPs, it has been reported that promoting handwashing has cut gastrointestinal and respiratory illnesses between 21% and 61% in low-income countries. And, Malaria prevention interventions can result in a 62% reduction in absenteeism (UN, 2022). Moreover, the importance of this early health awareness on a global level was also recognized by the World Health Organization (WHO) by introducing a school health campaign in 1995 (Murray et al., 2007).

Concerning the efficacy of the SHP, existing research show that enhancing student health knowledge improves their health-related activity (Almas et al., 2020, 2023; Silva et al., 2021). Recent global analyses underscore the effectiveness of comprehensive school-based interventions (Montgomery et al., 2020; Schere et al., 2023). Combining physical activity, nutrition education, and behavioral components significantly improved Body Mass Index (BMI) and health behaviors among children and adolescents (Hassan et al., 2024). Studies (Feiss et al., 2019; Hildebrand, 2022) demonstrated a positive association in health activities' effect on academic performance. However, health behavior modification approaches are still unclear and need in-depth exploration for effective implementation across regions (Aldahnaim et al., 2023; Almas et al., 2023). Susanto and Bahtiar (2016) studied how a school health initiative affected students' knowledge, attitude, and behavior and found a significant correlation. The above aspects were evaluated individually, however, the Theory of Planned Behavior (TPB) (Ajzen, 1991) states that their interdependence changes behavior. Almas et al. (2023) recently demonstrated that Pakistani school health programmes improve oral health. However, the findings must be interpreted cautiously as it's a long-term phenomenon and more evaluation of SHP may be conducted to assess its efficacy.

In order to comprehensively assess the efficacy of school health programmes in facilitating behavioral transformations among students, it is imperative to utilize a theoretical framework that can elucidate the fundamental mechanisms that drive changes in behavior. The Theory of Planned Behaviour (TPB) provides a thorough framework for examining how school health initiatives affect students' adoption and enhancement of healthy behaviors. This study explores the theoretical underpinnings of the TPB and how it is used in Pakistani school health programs.

Thus, by examining the relationships between students' attitudes, knowledge, and behavior—factors that are frequently assessed separately—this study seeks to close gaps in the body of previous research. In contrast to previous studies that focused on a single school, this research compares two types of schools using treatment and control groups. Thus, this research also looks at the long-term effects of the nine-year Punjab School Health Program, since a large portion of existing literature is based on pilot or short-term studies. The results are intended to help both practitioners and policymakers working to improve school health initiatives and promote sustainable healthy behaviors among students..

Literature Review

Theoretical Model: Theory of Planned Behavior

The Theory of Planned Behavior (TPB) originated as the Theory of Reasoned Action in 1980, with the aim of forecasting an individual's intention to partake in a behavior within a certain temporal and spatial context. The primary objective of the theory was to explain any behaviors that fall within the realm of human agency and can be influenced through self-regulation (Hale et al., 2002). The theory of reasoned action ascertained that a healthy diet and exercise activity are not totally in people's control (Orr et al., 2013). Ajzen (1991) added perceived behavioral control to address this external control. Consequently, TPB suggested that people are more likely to have a strong intention to adopt a particular behavior if they have a positive attitude towards it, perceive social approval from others, and believe they can perform it (Ajzen, 1991; Hammer et al., 2024).

TPB uses perceived behavioral control to explain behaviors outside an individual's control (Ajzen, 1991). TPB is a popular theoretical paradigm for analyzing health-related behaviors like eating, exercising and smoking (Hamilton et al., 2020). Theory ascertains that attitudes, subjective norms, and perceived behavioral control collectively shape human behaviors. Moreover, TPB provides a thorough framework for understanding how school health activities affect student intentions and behaviors. Such as; capacity limitations, lack of support supervision, and poor infrastructure were identified as key barriers to implementing school health programs in Kenya; factors that directly affect perceived behavioral control, a core construct of the TPB (Mbogo, 2016).

In TBP, intention—including motivation and planning—determines behavior immediately. Intention, which indicates motivation, is vital to understanding human behavior (Ajzen, 1991). Attitude towards the behavior, subjective norm (the felt social pressure to perform the conduct), and perceived behavioral control (the believed ability to perform the behavior) help explain their intents. These factors indicate an individual's overall motivation for the stated behavior and can influence an individual's intention to engage in a given conduct (Shmueli, 2021). Similarly, existing work in a similar domain supports the idea that implementation of TPB in the context of SHP, when implemented with multi-sector coordination, can address not just physical health gaps, but also promote educational equity and policy-level change both of which are highly relevant in the context of developing nations like Pakistan (Abdul et al., 2024). Thus, TPB summarizes that people are more likely to intend to do something when they have a positive attitude towards it and believe they can do it.

Attitude

Attitudes pertain to an individual's comprehensive assessment of a specific behavior (Ajzen, 1991). Positive attitudes are strongly linked to positive intentions, which encourage healthy conduct. Individuals who possess favorable attitudes towards the adoption of healthy habits, such as engaging in regular exercise and maintaining a balanced diet, are more inclined to have robust intentions to partake in these behaviors (Huang 2020; Hamilton et al., 2020). An individual who holds the belief that exercise is both pleasurable and advantageous is more likely to demonstrate a propensity towards engaging in regular exercise (French et al., 2005). Positive attitudes also serve as effective motivators (Godin, 1996). When individuals possess a positive disposition towards healthy habits, they exhibit a heightened motivation to both initiate and sustain those activities (Bosnjak et al., 2020). In this regard, motivation plays a key role, particularly in instances where the adoption of healthy behaviors necessitates surmounting difficulties or maintaining persistent effort. Furthermore, these attitudes contribute to the consistency of behavior (Ajzen, 2020). There is a favorable correlation between students who possess positive attitudes towards maintaining a healthy lifestyle and their tendency to consistently engage in healthy habits (Shmueli, 2021; Ying Tong et al., 2024). These findings

emphasize the importance of introducing positive health attitudes during adolescence to promote long-term behavior change.

The implementation of school health programmes in Pakistan has had positive outcomes in terms of enhancing students' perspectives on health and wellness (Shah et al., 2020; Almas et al., 2023). The enhancement of good habits in the long term is heavily reliant on individuals' attitudes. School health programmes that cultivate favorable attitudes have the potential to establish a foundation for enduring healthy behaviors throughout an individual's lifespan. Research has indicated that individuals who cultivate favorable attitudes during their educational journey are more inclined to sustain a pattern of making prudent decisions as they progress into the stage of adulthood (Gulzar et al., 2017; Arif, 2015). The inclusion of educational elements that highlight the advantages of adopting healthy behaviors play a significant role in fostering more favorable attitudes among students. Therefore, in the light of above-mentioned literature findings, following hypothesis is proposed:

H1: Attitude towards health bears a significant positive impact on student healthy behaviour.

Subjective Norms

Subjective norms refer to the individual's perception of social pressure or expectations exerted by important individuals about a particular behavior (Ajzen, 1991). Within the framework of TBP in the perspective of school health programmes, subjective norms may represent the perceived social pressure or influence from significant others (such as peers, teachers, and parents) regarding a specific health behavior (Hamilton et al., 2020). Students frequently encounter messages and support from educators, classmates, and guardians, urging them to adopt and practice healthy behaviors (Silva et al., 2021). When children observe that their peers and teachers support and promote healthy behaviors, they are more inclined to develop intentions to adopt similar behaviors (Gulzar et al., 2017; Centeio et al., 2021).

When peers or authority figures support and model health behaviors such as nutritious eating, exercising, or hygiene, students tend to consider them as being socially expected and accepted (Grønhoj et al., 2012). Research indicates that subjective norms, particularly those established by teachers and classmates, heavily impact adolescents' intentions towards adopting and maintaining healthy behaviors (Hammer et al., 2024; Ying Tong et al., 2024). Similarly, research instances showed that the mother, social contacts, significant others, and healthcare providers influence the way they feed their firstborn. New mothers will choose the technique considered preferred by these important people (Chouliara et al., 2004). Thus, it can be observed that the subjective norms of perceptions of close members of the family are an active influence on the individual and they have the potential to shape their behaviors.

School health programmes have been found to contribute to the formation of positive subjective norms by nurturing an environment that encourages healthy behavior (Gulzar et al., 2017; Dai, 2019). Students' perceptions of healthful behaviors as socially desirable and acceptable have been influenced by the approval of peers and teachers, as shown in the existing research (Centeio et al., 202; Silva et al., 2021). Therefore, the study proposes the following hypothesis:

H2: Subjective norms induce a significant and positive effect on student's healthy behavior.

Perceived Behavior Control

Perceived behavioral control refers to an individual's perception of their ability to perform a behavior successfully (Ajzen, 1991). School health programs often include practical components, such as physical education classes and access to nutritious meals, which can enhance students' confidence in their ability to adopt healthy behaviors (Rudnicka et al., 2020). When students believe that they have the necessary skills and resources to engage in healthy

behaviors, their intentions to do so are strengthened, increasing the likelihood of behavior enactment (Montgomery et al., 2020; Murray et al., 2007).

Earlier research indicates that for both African-American and college students, perceived behavioral control is the strongest predictor of nonsmoking intention, as it is an individual's subjective assessment of smoking cessation's ease or difficulty (Nehl et al., 2009). If people believe quitting smoking is easier, they are more inclined to try, reducing their risk of smoking. However, if the belief is that quitting smoking is difficult, smoking becomes more likely. Suggesting that its pragmatic implementation matters. Similar phenomena have been observed in research on college students' bike helmet use (Ross et al., 2011).

TPB implies that attitudes, subjective standards, and behavioral control influence intentions and actions. The individual's perception of the behavior's ease or difficulty can help or hinder its implementation (Ajzen (2020)). The more resources and fewer obstacles individuals perceive, the greater their perceived behavioral control and the stronger their intention to perform behaviors (Hamilton et al., 2020). When school environments offer supportive resources such as facilities, guidance, and skills training students feel empowered and are more likely to participate in healthy behaviors. SHPs must not only teach students about health decisions but also make them feel empowered to make such decisions. (Dewi Pata et al., 2024; Hammer et al., 2024)

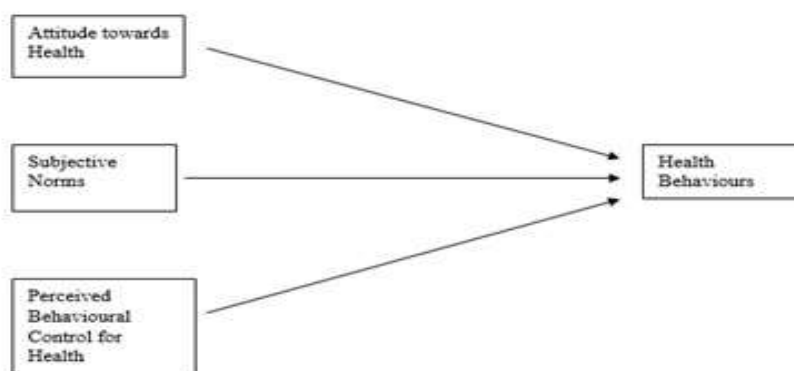
Students' perceptions of behavioral control have been enhanced by interventions such as providing access to sports facilities and nourishing meals (Dai, 2019; Bull et al., 2020). When students believe they are outfitted to engage in healthy behaviors, their intentions and subsequent actions correspond to these behaviors (DallaCosta et al., 2023). Therefore, drawing on the above-mentioned literature findings we propose the following hypothesis:

H3: Perceived behaviour control reflects a significant positive impact on student's healthy behaviour.

Theoretical Framework

The research framework, based on supportive literature review is given in figure 1 below.

Figure 1: Theoretical Model based on TPB



Research Methodology

Sampling and Data Collection

For this study, public schools from multiple districts in Punjab are selected, including both treatment and control groups. To assure reliability, 500 replies were targeted, as a sample of 383 is adequate for a population of 100,000 (Krejcie & Morgan, 1970). A total of 550

questionnaires were distributed among students from elementary and primary classes, and 505 were returned. The selection of the public schools from different districts was based on the acquisition of correct and reliable data as well as the convenience of the researcher. 17 questionnaires were dropped after initial scrutiny and not considered for further analysis. Therefore, 488 questionnaires have been considered for data analysis.

Scales

The scales for variables have been adapted from existing research. A 5-point Likert scale is used for every variable. This study adopted a scale of attitudes towards healthy behaviors (ATH) from Chan et al. (2009). This scale had 8 items. This study measured subjective norms (SN) by using a recently adapted 20 items scale of Grønhoj et al., (2012). Perceived behavioral control (PBC) scale was adopted from Wing-Kwan et al., (2009) that contained 12 items. Lastly, behavioral intention of students (BI) was assessed by adapting the scale of Chan & Tsang (2011), this scale had 5 items all of which are used in the current study. For ease of understanding of school students, the English language questions were adapted into Urdu language with the proper validation of an expert.

Data Analysis & Results

This research utilized variance-based Structural Equation Modeling (SEM) with SmartPLS, a well-established tool in social science research owing to its strength and flexibility (Hair et al., 2013). SEM is suited for examining complex models as it allows for the investigation of relationships between latent variables while at the same time controlling for measurement error (Watson, 2015). Following the measurement model and structural model assessment, a Multi-Group Analysis (MGA) is performed for the comparison of results between the treatment and control group.

At first, the measurement model for assessing reliability and validity is assessed by running the PLS algorithm. The outer loadings of the latent variable ranged from 0.696 to 0.897. Only one item has a loading of 0.697 which is marginally close to 0.7 whereas all other item loadings are above 0.7 which is considered cut-off criteria (Hair et al., 2013). For establishing reliability, the values of Cronbach alpha are considered as it is considered a dependable measure of scale reliability. The alpha coefficient values recorded in the model were all above well cut off 0.7 ensuring high reliability. The composite reliability (CR) is also established as is considered more appropriate for structural equation modeling of PLS (Hair et al., 2013). For convergent validity, AVE values are assessed, all above the cut-off criteria of 0.5 (Hair et al., 2013). Below given Table 1 below shows the values for the measurement model.

Table 1: Measurement Model with Reliability and Convergent Validity

Items	Outer Loading	Composite reliability	Cronbach's Alpha	AVE
AT1 <- Attitude Towards Health	0.735	0.905	0.874	0.614
AT2<- Attitude Towards Health	0.742			
AT3<- Attitude Towards Health	0.799			
AT6 <- Attitude Towards Health	0.835			
AT7 <- Attitude Towards Health	0.840			
AT8 <- Attitude Towards Health	0.740	0.946	0.937	0.658
PBC1 <- Perceived Behaviours control	0.791			
PBC 2 <- Perceived Behaviours control	0.818			
PBC 3 <- Perceived Behaviours control	0.857			
PBC 4 <- Perceived Behaviours control	0.802			

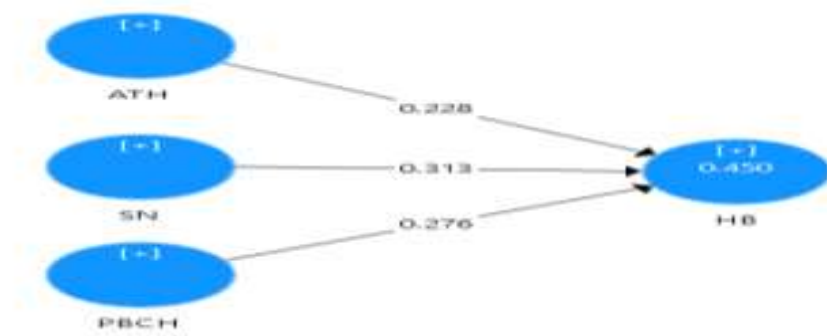
PBC 5 <- Perceived Behaviours control	0.799			
PBC 6 <- Perceived Behaviours control	0.768			
PBC 7 <- Perceived Behaviours control	0.839			
PBC 8 <- Perceived Behaviours control	0.696			
PBC 9 <- Perceived Behaviours control	0.756			
PBC 10 <- Perceived Behaviours control	0.848			
SN1 <- Subjective Norms	0.832	0.936	0.916	0.638
SN 2 <- Subjective Norms	0.719			
SN 3 <- Subjective Norms	0.876			
SN 4 <- Subjective Norms	0.882			
SN 5 <- Subjective Norms	0.853			
SN 6 <- Subjective Norms	0.794			
SN 7 <- Subjective Norms	0.891			
SN 8 <- Subjective Norms	0.897			
SN 9 <- Subjective Norms	0.701			
HB1 <- Health Behaviours	0.834	0.885	0.826	0.655
HB 2 <- Health Behaviours	0.778			
HB 3 <- Health Behaviours	0.831			
HB 4 <- Health Behaviours	0.789			

For measuring discriminant validity and eliminating the concern of co-linearity HTMT ratio is used with all values in the acceptable range. The details are given in the Table 2 below.

Table 2: Discriminant Validity using HTMT ratio

	ATH	HB	PBCH	SN
ATH				
HB	0.613			
PBCH	0.699	0.644		
SN	0.455	0.614	0.528	

Afterwards, the coefficient of determination (R^2), as shown in Figure 2 below, is assessed to explain the model's predictive strength. The value of 0.450 in students' health behaviors indicates substantial explanatory power. In addition, Stone-Gaiser test criteria (Q^2) are assessed by using a blindfolding algorithm in Smart PLS. The value of 0.276, being well above zero, indicates enough predictive relevance (Hair, et al, 2013).

Figure 2: 1 Structural Model with R² values

For assessing the hypotheses of the research, path coefficient values are given in the table 3 below.

Table 3: Path Coefficient, T values, P values

	Original Sample	T Statistics	P Values
ATH => HB	0.228	3.711	0.000
PBCH => HB	0.276	4.520	0.000
SN=> HB	0.313	5.861	0.000

H1 established student's attitude towards health having a significant impact on student healthy behavior ($\beta=.228$, $t = 3.711$, $p <.001$). H2 supported the role of subjective norms and their significant impact on student healthy behavior ($\beta=.276$, $t = 4.520$, $p <.001$). H3 recognized the importance of perceived behavior control and its significantly impact on student healthy behavior ($\beta=.276$, $t = 4.520$, $p <.001$). Thus, all the hypotheses of theoretical model are supported.

Multi Group Analysis

After establishing the hypotheses, Multi-Group Analysis (MGA) is conducted in Smart PLS to compare the groups of data (control group and treatment group). The respondents from healthcare programs are further categorized into three subgroups 1-2 years, 2-5 years and 5+ years. The study opted to investigate if the perception of health behaviors of respondents that went through health care programs is any different from the opposite. The results already established the positive and significant effect of three dimensions on health behaviors and recognized the model fit but since the aim was to assess the long-term efficacy of the healthcare programme, separate data groups are analyzed and compared for each hypothesis. The results of MGA are stated in the table below.

Table 4: Multi-Group Analysis (MGA)

Relations ships	Over all	Class		Gender		Age			Duration			
		5th	8th	Male	Femal e	5-10 year	10-15 year	15+ year	Never	1-2 year	3-5 year	5+ year
ATH => HB	0.228*	0.234**	0.218**	0.234**	0.218 **	0.300*	0.175**	0.229-*	0.122 -ns	0.270**	0.237**	0.747*
PBCH => HB	0.276*	0.245**	0.297*	0.245**	0.297 *	0.269**	0.258**	0.323 **	0.072 -ns	0.230- ns	0.317 **	0.336*
SN=> HB	0.313*	0.398*	0.261*	0.398*	0.261 *	0.323*	0.395*	0.261**	0.114 -ns	0.216- ns	0.309 **	0.371*

Note: P values (*significant at $p < 0.01$ **significant at $p < 0.05$ -ns not significant)

The final hypothesis of the study measured whether school healthcare programmes displayed a long-term effect or not. The results of MGA established the significant long-term effect of the school health programme. As in the ‘never’ data group, all three relationships were found insignificant as shown in Table 4, whereas, in the 5+ year data group all the relationships were found significant. It can be noted that the strength of the relationship started to increase gradually as the period of SHP started increasing. Moreover, concerning the significance of difference, the only significant difference noted was between the ‘never’ data group and the ‘5+’ years data group for 2 out of three constructs. ATH=>HB showed a significant difference ($t=2.094$, $p=0.037$). PBCH=>HB showed a significant difference ($t=2.032$, $p=0.043$). However, the third relation of SN=>HB failed to show a significant difference ($t=0.837$, $p>0.05$). The results substantially conclude that the school health programme has a positive long-term effect.

For an in-depth understanding, this study analyzed whether the perception of health behaviors was different among different subgroups of our sample (class level, gender, age group). MGA on respondent’s class i-e 5th class and 8th class revealed that there wasn’t a significant difference between class 5th and class 8th level students as all the relationships were significant in both classes. Regarding respondents’ gender, the results demonstrated that no significant difference between male and female students is present as perceptions of health behaviors are the same for both basic genders. Lastly, respondent’s age groups are analyzed with results displaying no significant difference.

Discussion

TPB offers a strong theoretical foundation for understanding how SHPs in Pakistan can influence and improve students’ health behaviors. By promoting and influencing students’ attitudes, subjective norms, and perceived behavioral control, these programmes assume a crucial role in promoting healthy behaviors among students. Empirical evidence establishes that school health initiatives have made sustainable and significant progress in positively influencing these three constructs of TPB, thereby contributing to the adoption of healthier lifestyles by students.

Findings indicated that subjective norms, adolescents’ attitudes towards healthy behavior, and perceived behavioral control are positively related to their intention to adopt healthy behaviors. Ease of adopting such behavior and peer-influenced attitudes are found to be the most important predictors of healthy intentions. Theoretically, this aligns with TPB’s proposition that behavioral intention is the immediate antecedent to behavior, and intention itself is strengthened when all three antecedents (attitude, norms, control) are positively formed. The results complement existing research on the influence of perceived control and positive attitudes on behavior (Almas et al., 2020; Scherer et al., 2023). Teachers had a facilitating role

by reminding students to eat, exercise, and remain health-conscious. Students appreciated nutrition, hygiene, physical exercise, and health education. In general, the School Health Programme (SHP) proved that health education can bring about behavioral change. The control group was compared with the treatment group, which had more positive behavioral outcomes, and this emphasized the effect of focused health education. It can be concluded that schools can be effective sites for promoting long-term healthy behaviors and overall well-being.

Results established that student health attitudes play a pivotal function in determining the health habits. Health mentors also promoted exercise, and students experienced a sense of responsibility and even guilt when they failed to take action—these feelings of accountability led to positive attitudes and healthy habits. Secondly, subjective norms are found to have a substantial impact on the behavior of the students; endorsement by parents, teachers, and peers facilitated enhanced eating and physical exercise habits. Thirdly, the study showed strong evidence that perceived behavioral control is an essential factor in fostering positive health behaviors. Students in the SHP experienced a sense of increased control over diet and health habits, becoming more responsive, disciplined, and committed to healthy practices. This supports TPB's theoretical assertion that perceived behavioral control not only influences intention but can also directly affect behavior when actual control is high—a likely case in school environments with structured health activities. These results are aligned with previous explorations of TPB in school health settings (Silva et al., 2021; DallaCosta et al., 2023).

For the first time, the current research paradigm includes two groups; treatment groups and control groups, that to in the context of a developing country like Pakistan to increase health education and awareness for shaping health behaviors. Existing literature is mostly silent on the long-term efficacy of school health programmes and this study looks to be the first to establish it. Particularly, students from the treatment group who were enrolled in healthcare programmes for over 5 years differed significantly from those who never attended. Thus, healthcare programmes assert long-term implications and take time to change student health habits. These findings play an important role in refining the theory.

The findings emphasize that the School Health Programme is a regional effort to enhance school culture for every child and has to consider context. Adapting these programs to local settings can make them more effective since health behaviors are context-dependent. In line with previous studies (Almas et al., 2020; Gulzar et al., 2017), this research sustains the position that there is a need for elementary knowledge of a healthy lifestyle before the practice of such behaviors and that the well-being of children prominently impacts their general welfare. Health programs can bring about a healthier society and help achieve national development. In theoretical terms, this aligns with TPB's flexibility to be adapted across cultures and education levels, as long as interventions are contextually relevant, participatory, and sustained. Overall, a successful school health programme can preclude serious health and social complications while promoting both education and lifelong healthy behaviors.

Practical Implications & Recommendations

Based on the findings, it is highly recommended that health education be integrated into the School Health Programme (SHP) at all public schools in Pakistan. The study validates that such interventions have a positive impact on student's health behaviors and are the grounds for healthier lives in the future. Even though this study was conducted on public schools, interventions can be applied to private schools as well, and policymakers must look for partnerships to ensure proper implementation in non-governmental schools.

The study recommends effectively integrating health education into the school curriculum to promote lasting healthy habits. Participants recognized the worth of the programme and recommended that adding fun and interactive approaches would further increase student participation. Although the primary emphasis was on physical health behaviors, mental health

also needs to be addressed. Schools are a strategic location for early detection and intervention, particularly in resource-constrained settings. Recent evidence supports the inclusion of mental health literacy, teacher training, and evidence-based interventions like cognitive behavioral interventions within SHPs (Ali, 2024; Ijaz et al., 2024). The inclusion of these factors is consistent with the Theory of Planned Behavior by strengthening students' perceived control, attitudes, and social support for health.

For effective regional implementation, coordinated action by the Ministries of Health and Education is a prerequisite, supported also by UN agencies and professional associations. The involvement of national and international stakeholders can help achieve long-term cooperation towards enhancing the health and well-being of students from an early age.

Conclusion

This research reiterates the pertinence of TPB in explaining and enhancing health-promoting behaviors among school-going students in Pakistan. By considering the effect of school health programs on students' attitudes, subjective norms, and perceived control over behavior, the study confirms that these constructs have a significant role in shaping behavioral intentions as well as stimulating healthy habits. The research presents evidence for the effectiveness of structured, longitudinal school-based health interventions in inducing meaningful behavior change—especially when reinforced by teachers, peers, and an enabling environment. Notably, the role of perceived control and peer-led attitudes came out as powerful predictors of healthy behavior. The research adds valuable theory as it places the TPB framework in a developing country context, adopts a control–treatment group design, and highlights the long-term implication of health education in schools. These findings support the inclusion of health education in school curricula and the development of participator programmes to foster sustainable health outcomes.

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