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The Guided School Fitness Model: Confidence (CAPL-2) as the Mediator of Behaviour Change in Inactive Schoolchildren

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A B S T R A C T

Objective: This study aims to examine the Guided School Fitness Model, especially the Functional Training Program (FTP).

Methods and Materials: Functional Training Program (FTP) used as an intervention to increase physical activity behavior (PAB) in inactive schoolchildren. Based on Self-determination Theory (SDT), the authors hypothesized that FTP's effect on PAB would be mediated through changes in schoolchildren's confidence, exercise retention, and knowledge & understanding.

Results: The FTP had a significant positive effect on confidence (β=0.624), exercise retention (β=0.755), and knowledge & understanding (β=0.684). All three mediators positively influenced PAB: confidence (β=0.543), exercise retention (β=0.498), and knowledge & understanding (β=0.571) improved physical activity behavior. Importantly, the mediation analysis confirmed that the FTP's effect on PAB is mediated by these three variables. The indirect effect from the mediation analysis via confidence (β=0.486), exercise retention (β=0.522), and knowledge & understanding (β=0.448) were all statistically significant, demonstrating specific pathways of behavior change. It also demonstrated that the model significantly explained a portion of the variance in PAB, indicating high predictive strength.

Conclusion: These findings indicate that successful interventions need to be holistic and address not only physical activity but also aspects such as confidence, long-term participation, and health literacy to achieve sustainable behavior change in inactive children.

Keywords: *Functional Training Program (FTP), physical activity behavior (PAB), Confidence, Exercise Retention, Knowledge & Understanding.*

1. Introduction

Childhood obesity, sedentary behavior, and lack of fitness are global public health challenges that are associated with non-communicable diseases, such as diabetes, heart disease, and various cancers (1). These conditions contribute to poor quality of life and, in turn, affect health systems financially. Pakistan's obesity

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prevalence shows that around 50% of the population is overweight or obese (2), making it the 10th highest in the world. It is estimated that by 2030, 5.4 million school-aged children will be obese (3). Sedentary lifestyles, characterized by physical inactivity, and behaviour with higher caloric intake and screen time, and less physical activity, put children at risk for obesity and have also been shown to decrease children's motor skills (1). Given this knowledge, physical activity (PA) should remain important to children's physical development, as this will improve fine and gross motor skills (4, 5).

Recent research has revealed the importance of physical literacy in developing a healthy lifestyle and fostering a love of movement and sport and the importance of PL development in the early developmental years and amongst school-aged children age 8-12 years (6, 7). Participation in a variety of physical activity and sport is based on developing PL competencies involving fundamental movement skills including running, jumping, throwing, and catching (4). This foundation fosters physically active and healthy lifestyles in adulthood, especially when combined with knowledge of the benefits of physical activity (8).

There is increasing evidence that physical literacy, defined as the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life, is a key factor linked with life-long physical activity (9). The Canadian Assessment of Physical Literacy provides a comprehensive framework to assess significant elements of PL, and could be an avenue to examine the potential effects of an intervention such as FTP. This study focuses specifically on three physical literacy domains like Confidence, Exercise Retention, and Knowledge & Understanding (10). These domains comprise the psychological, habitual, and cognitive elements of physical literacy, and are hypothesized to be essential intermediates in the pathway from structured training to observable activity behaviour changes.

Globally, physical inactivity among children and adolescents is at an alarming level, which contributes to serious public health problems related to chronic disease, obesity, and mental health (4). Although the benefits of regular physical activity are extensively documented, the translation of school-based interventions to behavioral changes among youth has generally produced limited results (11). Tanveer, Asghar (5) emphasize between providing opportunities for physical activity and establishing the intrinsic motivation and competence needed for sustainable behavioral change. Effective interventions must manage to go beyond prescriptive recommendations related to opportunities for activity and support the cognitive and psychological variables associated with a child's decision to be physically active (1).

The Functional Training Program has emerged as a multi-component intervention to enhance physical fitness and basic movement skills in children and adolescents, particularly by integrating purposeful, age-specific, and engaging activities (12). FTP emphasizes functional movements like squats, lunges, and balance drills that promote coordination, strength, and agility. These programs aim to make physical activity more relevant to daily life, fostering enjoyment and adherence .However, the mechanisms by which these experiences lead to sustained behavior change remain a subject of ongoing investigation (6-8).

After decades spent studying school-based physical activity interventions, remarkably little about mechanisms of behavioral change (13). While studies abound confirming physical activity interventions increase physical activity in the short term, they often do not explain why behavior change is rarely sustained in the long term. The existing research literature focuses primarily on outcome-based efficacy (i.e., the extent to which an intervention works), while neglecting a considerable amount of work examining the psychological/cognitive pathways leading to sustained behavior, a problem with devising grossly targeted interventions based closely on theory (10). Moreover, a serious handicap to understanding mechanisms is the over-reliance on single-component interventions that address physical literacy in terms of one component (e.g. physical literacy as physical competence, physical literacy as knowledge), rather than conceiving and addressing interconnecting multiple domains (e.g. competence and motivation or knowledge and competence) that work together to influence behavior (14). Rather than merely advocating for more physical activity, future programs may be developed to intentionally cultivate a child’s confidence and knowledge that will result in increased accountability around their personal physical health.

2. Literature Review

2.1 Self-Determination Theory

Self-Determination Theory (SDT) is a prominent theory of human motivation that examines the nature of motivation, rather than just the sheer quantity of it (15, 16). This makes

it particularly useful for predicting sustainable health behaviors, including physical activity, healthy eating, and quitting smoking. A crucial aspect of SDT is the differentiation of autonomous motivation (a behavior that is fully self-endorsed, selected freely, and aligned with one's values and sense of self) and controlled motivation (a behavior that is motivated by either an external pressure or internal demand)Ryan, Duineveld (15). Sustainable behavior change is facilitated by the internalization of autonomous motivation.

The concept of Competence, feeling effective and capable to achieve what one wants to in movement context is directly supported, through the FTP, via the mediators Self-Confidence and Knowledge and Understanding. Self-Confidence is a direct measure of a person's perceived competence, with regards to their physical ability. Through participation in the FTP and successful mastery of functional movements, as outlined in the FTP, participants are supported in their sense of accomplishment (competence), which in turn supports self-confidence (6, 15).

Knowledge and Understanding supports competence as it provides the cognitive resources necessary for an individual to make effective decisions (or feel competent) to prevent physical inactivity. The social aspect of the FTP focuses on student education on why they are involved with functional movement and the reasoning behind educational focus, which provides children with a clear, functional understanding of the expectations of the FTP. That clarity is a capacity of competence, as it supports children in understanding the significant value of media with the management of their own corporeal behavior (11). The requirement for Autonomy, or experiencing oneself as the source of their own actions, is met by embedding the Knowledge and Understanding mediator. If we provide an explanation and understanding of the functional movements, we are not merely providing a recommended action but are providing an informational choice that promotes volition. Once children understand the intention, they internalize the value of performing each of the movements, hence transforming the appearance of 'doing what they're told' into a 'chain of self-determined choices'. This promotes autonomy by changing the way they engage in physical activity by generating a shift from compliance to self-endorsement. While both cognitive mediators may not explicitly address the need for Relatedness feeling a sense of belonging with and connecting with others the basic framework and delivery of the FTP support this (6, 15). Finally, Exercise Retention can be considered a behavior result from meeting the child's psychological needs. Once children feel more competent (confident) about their physical activity and are more knowledgeable about it, they will internalize the value of the behavior, and continue on their own without needing external motivational inputs.

Although it may seem limiting to choose constructs for our mediation model that do not include constructs such as relatedness or enjoyment, choosing confidence (competence), knowledge and understanding (autonomy), and exercise retention may actually be strongly justified by their inherent fit with the specific problem we are tackling: the failure to maintain a long-term behavior change in physical activity interventions (6, 15). Confidence and knowledge, in fact, may be the most basic and directly manipulatable psychological resources in schools in a structured setting, directly connecting to the SDT needs of competence and autonomy needed to internally motivate participants. Exercise retention, then, simply serves to be the essential behavioral outcome connecting these psychological mediators to sustained behavior as the measurable bridge between cognitive/affective shift and a long-term habit. While relatedness and enjoyment are undoubtedly important (in reference to SDT's relatedness and intrinsic interest) constructs, confidence and knowledge are much more precise, targeted goals for the curriculum-based, skill-and-education, ready-to-roll out physiotherapy intervention focused on schools, thus providing a clearer pathway to mechanistically address the overarching problem of long-term behavior (11).

2.2 FTP (Functional Training Program)

Physical activity interventions are becoming more recognized in regards to their psychological advantages, especially in terms of inactive youth being able to build their self-efficacy and confidence through participation (17). Studies continue to show a positive relationship between the involvement in a structured/purposeful physical activity program and improvements in a child's perceived physical competence and self-worth (18). This was true with programs that incorporated mastery-oriented goals, rather than competitive ones. In particular, FTP can be useful for inactive schoolchildren who have negative experiences regarding participation in traditional sports or, were not good athletes. A program like FTP where skill acquisition and personal achievement are more important than competiveness, could easily help inactive youth (19). The structured, purposeful action of functional training can give

children an opportunity to find success without fear of being graded and to feel a sense of success in a structured setting. It is crucial for children to feel self-confident and to have the expectation to engage in physical activities, prior to the idea of engaging in physical activity on their own. Based on previous studies of different physical activity interventions, a child's belief they can be physically active, as one predictor of future participation, was a consistent influence on whether the child engaged in physical activity (8, 18). Hale, Colquhoun (17) showed a longitudinal school-based fitness program with young children as the participants and the self-perceived athletic competence was a growth metric/measure of interest. It was significant for all participants, and greater for those who were less active initially. This implies that the FTP will likely directly increase the confidence of non-active schoolchildren and create the conditions for longer-term behaviour change by providing an enjoyable and skill-development experience.

H1: *FTP has a significant impact on Confidence.*

Exercise retention is an important - albeit sometimes overlooked - outcome measure of physical activity interventions with school-aged children (20). While many interventions succeed in getting a child to be physically active for the duration of the program, the real challenge is to develop habits that will continue beyond the intervention. Goals for sustainability around physical activity depend not only on the quantity of exercise children were partaking in, but primarily in the quality of those experiences (6). It has been shown that children are more likely to partake in physical activity if their experiences are enjoyable, meaningful and intrinsically motivated (20). More importantly, the design of the FTP is that it uses a variety of functional movements and skill based challenges to ensure exercise feels more like playing and less like exercising, so that feelings associated with retention will be positive in nature. Research on youth physical activity adherence emphasizes the value of intrinsic motivation (18, 21). The perceived level of competence and autonomy provided by programs like FTP, directly enhances intrinsic motivation. For instance, one meta-analysis of physical activity interventions for adolescents found that programs including self-directed action and skill mastery had higher retention than programs that were externally controlled (6, 20). With the FTP focusing on skill development and positive disposition towards exercising, it is likely that the FTP uniquely impacts the likelihood of young participants to sustain their active lifestyle after the completion of the program, as it would be an essential mediator in influencing long-term impact on physical activity behavior.

H2: *FTP has significant impact on exercise retention.*

The cognitive component of physical literacy (which incorporates a child's knowledge and understanding of health and fitness) is a significant aspect of their ability to make informed decisions about physical activity (10). While several interventions target only the physical, substantial evidence indicates that a comprehensively educated child (one who understands not only the how, but the why), one that is feeling empowered, is more likely to self-regulate their activity. To a significant extent, inactive schoolchildren not only lack the physical activity and health knowledge, but they also might lack the awareness of basic anatomy, exercise principles, or the benefits of a physically active lifestyle - this is where the FTP's educational component of it all (inclusion of education during training) matters (9). In the case of the FTP, it is easy to embed lessons about muscle groups, cardiovascular health, and the value of warm-up and cool-down directly into a training session. Teaching an inactive child cognitive activity knowledge builds important cognitive infrastructure and can facilitate self-regulation over time. Prior research examining knowledge development in physical education contexts shows that significantly developing a child's understanding of principles of physical activity in sport settings is positively correlated with self-reported physical activity (9, 10, 22). When children understand why they are performing a specific exercise - when they know and understand the health benefits of being active - children tend to value and engage in activity. Explicitly asking the FTP participants to build knowledge regarding physical literacy will have a significant and positive impact on their PAB (23).

H3: *FTP has a significant impact on Knowledge & Understanding.*

2.3 Physical Activity Behaviour (SP↑, PF↑, SB↓)

The relationship between confidence and physical activity behavior is widely documented in the psychological literature. (24)suggests that a person's confidence in performing a specific behavior (e.g., physical activity) is the strongest predictor of their actual behavior. For inactive school-aged children, lack of confidence is often their biggest barrier to participation. For many inactive school-aged children, lack of confidence is prevalent because they feel they are "not good at sports, have never tried any type of physical activity, or feel that people may judge them

based on their participation" (17). Given that a child's confidence and self-efficacy is a significant driver of their physical activity behavior, interventions that can build a child's confidence and self-efficacy are not only focused on a psychological variable, but targeting a central driver of physical activity behavior. Prior research has repeatedly identified an association between physical self-concept and child's physical activity (22). Generally, researchers report that children who have more confidence in their physical capabilities engage in a higher level of sport and active recreation outside of formal school settings. Given the Guided School Fitness Model forwards the premise that the FTP will stimulate confidence; the final consideration is that confidence will then translate into physical activity behaviour increase, an increase in sports and fitness , improved fitness performance and reduced sedentary behaviour (9). Papadopoulos, Mantilla (25) that confidence is not just a product (considering it is the level of intervention), but rather it is an important psychological lever and will play a central role in effecting sustainable behavioural change.

H4: *Confidence has a positive and significant impact on PAB.*

The short-term effects of an intervention that has physical activity as an end goal can often be measured by the increase in activity levels during the course of the program; however, the true success of a physical activity intervention is rooted in the post-program behavior change that can be sustained over time, which is ultimately captured in the outcome of exercise retention (11). The assumption is that physically active youth, who maintain their activity after formal intervention, are also exhibiting higher levels of PAB. The ideal pawn of any successful school-based program is for this transition from guided participation to self-directed activity (10). Exercise retention is thought represent a migration from external to internal motivation, whereby the youth excitedly engages in activity without the structure of any formal program (13, 26). Lasković, Marković's (20) study of youth physical activity shows that when children adhere to physical activity as children, it has significant implications for adult-level engagement in physical activity. Therefore, the FTP would instill exercise retention with the hypothesis being that FTP will have a long-term positive impact on youth PA levels or physical activity behavior. By reinforcing physical activity habits over an extended period, children who participate in the community FTP, will create a new lifestyle that incorporates movement into their daily living, increasing their participation in sports and fitness, overall improved physical fitness, and time spent sedentary will decline.

H5: *Exercise retention has a positive and significant impact on PAB.*

Understanding and knowledge about physical activity is an integral part of the foundation of physical literacy and is an important process that allows a child to make informed decisions related to their health (14). For inactive school-aged children, the lack of general knowledge of the benefits of exercise or how to safely perform movements is often an obstacle to participating. When children have an understanding of the connection between physical movement and health outcomes (i.e., strong bones, a healthy heart), they are more likely to appreciate the value of being active and prioritize it. This is a cognitive process that is more than simply remembering facts, it is creating a working knowledge of the physical world so a child may be able to move through it and make decisions based on knowledge and health (25). There is good evidence in the literature for an association between health knowledge and rates of physical activity among young people. Studies have found that the educational components of school-based interventions that address exercise principles and the advantages of an active lifestyle contribute to creating large improvements in self-reported physical activity (13). When kids were given the knowledge tools to comprehend the significance of exercise, the entire program gave them the opportunity to be responsible for their own well-being by exercising more in the future, more engaged in sports and physical activity, and keep them from being inactive.

H6: *Knowledge & Understanding has a positive and significant impact on PAB.*

2.4 The Mediating Role of Confidence

There is ample evidence that interventions that focus on improving physical skills and competence significantly improve self-efficacy, which is one of the strongest predictors of continued physical activity (19). For inactive schoolchildren, who generally have lower self-efficacy because of lower levels of self-confidence, the success and skill development with the structured environment of a program like FTP could have a life-changing impact. The child who has greater self-efficacy stemming from success on a new exercise or the development of a new skill creates an accumulation of psychological factors that lessen the barriers based on their evaluation of physical activity and also motivates them to be more active in general (i.e., at

school and at home during free time) (27). It would be one of the first studies to provide empirical evidence that an intervention can specifically target a child's psychological state and the importance of confidence and self-belief, and that this is a valuable and viable pathway to long-term behaviour change (6). In establishing a clear, theoretically driven mechanism, the study would reinforce the need to design programmers that are physically demanding but are intentionally designed in a way that leads the child to new levels of mastery and self-efficacy that promotes lifelong fitness.

H7: *Confidence has a positive and significant mediating impact between FTP and PAB.*

2.5 The Mediating Role of Exercise Retention

Research indicates that programs would have the most success if they not only temporarily increased participation but created a desire to participate (27). Research has shown that school-based programs that can lead to increased enjoyment of physical activity by a child are more likely to support longer-term child engagement and excitement, meaning those kids maintain the same percentage of activity years later (1). This suggests that the efficacy of overt behavior, that of supporting retention, is likely the critical piece linking the FTP program itself and the desired behavioral changes. If we can show that the exercise retention mediates the effect of the FTP on PAB that a more important claim developed from the research will be that it is important to design not only an effective program/ intervention, but specifically for the purpose of creating long term habits (5). It stresses that the goal of the program was not only to make a child active during the period of engagement in the program, but to be active for life.

H8: *Exercise retention has a positive and significant mediating impact between FTP and PAB.*

2.6 The Mediating Role of Knowledge & Understanding

Prior research in health education and physical activity confirms the notion that knowledge is both a consequence of action and a key motivator, driving a change in behaviour (28). Research has demonstrated that when adolescents know factors such as principles of exercise, their risk for long-term inactivity, and the health consequences, they are better able to self-regulate their physical activity levels (29). When we consider those schoolchildren who are inactive and not yet aware of the underpinning knowledge, a program providing both contextual and theoretical learning, like FTP could be very beneficial. The "a-ha" moment when a child realizes that the specific exercise they are doing bears a connection to a health benefit can create a strong, motivating association, turning a chore into a valued and purposeful activity (9). Furthermore, its contribution to a change in behaviour is not purely from a child's heightened physical skill or confidence, but also from the child's cognitive understanding. Finally, the in-depth discussion about a program's contribution to a commitment to memory provides direction for building comprehensive Physical Literacy programs which address not the physical and emotional 'ways' of physical activity, but 'thinking' too (27). Through education that allows children to make educated choices, the FTP empowers children with an ability they can use to help them lead a healthy and active life for years to come.

H9: *Knowledge & Understanding has a positive and significant mediating impact between FTP and PAB*

2.7 Conceptual Framework

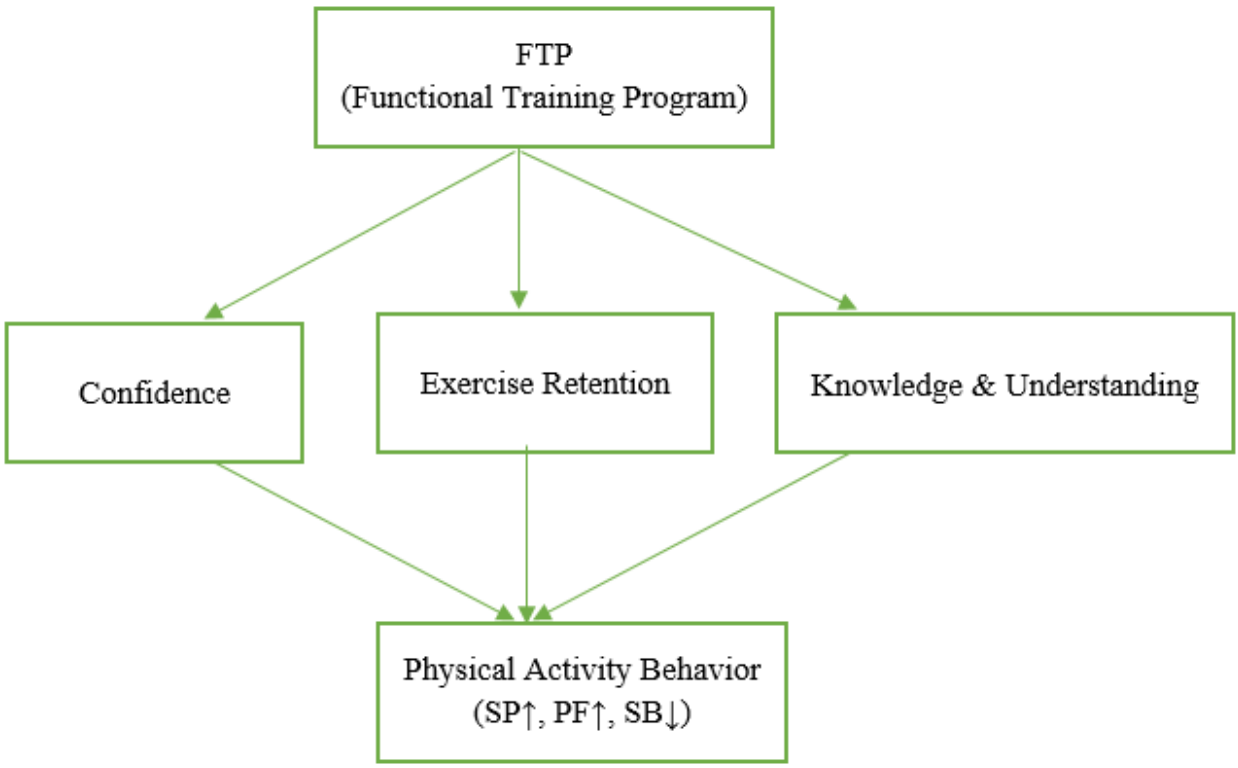

Figure 1. FTP (Functional Training Program) → FTP effects on PAB mediated by Confidence, Exercise Retention and Knowledge & Understanding

3. Methods and Materials

3.1 Study Design

The study utilized a quantitative, cross-sectional survey design to investigate the relationships between the FTP on PAB mediated by confidence, exercise retention and knowledge & understanding. Since the cross-sectional survey design captures all variables (interventions, mediators like confidence/knowledge, and outcomes like retention) at a single point in time, it greatly restricts our ability to establish causality or gain definitive interpretations of the proposed mediation pathways, since we cannot specify temporal order. Accordingly, any indirect-path ('mediation') analyses are exploratory and describe statistical associations rather than causal effects.

3.2 Ethical Considerations

Before data collection, this research has been approved by the University Malaya Research Ethics Committee (UM.TNC2/UMREC_3831) and the School Education Department (SED. Memo No.227/G.B).

3.3 Participants

School children who are inactive and not interested in taking part in sports activities from the School Education Department (SED Punjab). The overall number of participants (N) involved in this study was 90.

3.4 Inclusion and Exclusion Criteria

Participants were identified via teacher referral and screening against the 'inactive' criterion (<60 min/day MVPA on ≥5 days in the past week using YAP). Parents provided consent and children assented. Inclusion: Age 9-12, enrolled at participating schools, met inactivity criterion. Exclusion: physician-advised activity restriction; inability to complete measures. Of N_screened, N_included met criteria; N=90 provided complete data.

Table 1. Inclusion and Exclusion Criteria.

Category	Criteria
Inclusion	School enrollment within participating schools (age 9-12)
	Meeting the defined criteria for "inactive" (e.g., specific daily physical activity threshold).
	Parental/Guardian and child assent/consent obtained.
Exclusion	Diagnosed medical conditions that limit participation in physical activity.
	Failure to meet the "inactive" definition (i.e., being highly active).
	Lack of necessary consent or inability to complete study measures.

3.5 Instruments

Total 33 items were used in this study.

3.5.1 Physical Activity Behaviour

To measure individual-level PAB factors, as well as physical fitness was measured using an adapted scale of the EUROFIT test battery with reported by (30). The sports participation of inactive school children was measured using the YAP scale with reported by (31).The sedentary behavior of inactive school children was measured using the YAP scale with reported by (31). The items are measured using a 5-point Likert scale, and the overall PAB reliability measures using Cronbach's alpha was 0.779.

3.5.2 Functional Training Program

To measure the FTP 4-item scale was adapted by (32). The items are measured using a 5-point Likert scale, and the reliability measures using Cronbach's alpha was 0.887.

3.5.3 Confidence

To measure the CAPL-2 confidence was adapted 6-item scale, by (33). The items are measured using a 5-point Likert scale, and the reliability measures using Cronbach's alpha was 0.785.

3.5.4 Exercise Retention

The exercise retention/ Adherence was measured using a 5-item scale adapted by (21). The items are measured using a 5-point Likert scale, and the reliability measures using Cronbach's alpha was 0.903.

3.5.5 Knowledge & Understanding

The knowledge & understanding were measured using a 5-item scale adapted by (34). The items are measured using a 5-point Likert scale, and the reliability measures using Cronbach's alpha was 0.878.

3.6 Data Analysis

The data were analyzed using the partial least squares structural equation modelling (PLS-SEM) approach. This approach or modeling analysis is appropriate for exploratory studies such as in this study. Hair, Sarstedt (35)stated that the PLS-SEM approach is appropriate because it does not have strict sample size specifications and can be applied even if the data is not normally distributed.

4. Results

4.1 Evaluation of F.L, Validity, Reliability, AVE

Using the partial least squares structural equation modelling (PLS-SEM) approach, we assessed the measurement model to determine the reliability and validity of the latent constructs. According to Hair, Sarstedt (35), "The reliability and validity of the measurement model need to be evaluated first." Thus, we proceeded to evaluate the convergent validity and consistency reliability of each of the indicators. We evaluated the reliability of the scale using the composite reliability (CR) and evaluated the convergent validity using the average variance extracted (AVE). Internal consistency reliability was evaluated primarily using Cronbach's alpha (α), where all constructs met the threshold of 0.70 (35), ranging from 0.779 to 0.903. The model also exhibited convergent validity using the Factor Loadings (which should be ≥ 0.70), the Composite Reliability (CR) (which should be ≥ 0.70), and the Average Variance Extracted (AVE) (which should be ≥ 0.50).

Table 2. Assessment of validity, Reliability and AVE.

Constructs	Items	Factor. L	Alpha	CR	AVE
Physical Activity Behaviors			0.779	0.784	0.513
Sports Participation	SP1	0.768			
	SP2	0.751			
	SP3	0.761			
	SP4	0.784			
	SP5	0.759			
Physical Fitness	PF1	0.777			
	PF2	0.786			
	PF3	0.857			
	PF4	0.778			
Sedentary Behavior	SB1	0.751			
	SB2	0.787			
	SB3	0.865			
	SB4	0.776			
Functional Training Program	FTP1	0.798	0.887	0.764	0.543
	FTP2	0.875			
	FTP3	0.775			
	FTP4	0.785			
Confidence	CO1	0.780	0.785	0.853	0.587
	CO2	0.836			
	CO3	0.815			
	CO4	0.743			
	CO5	0.799			
	CO6	0.748			
Exercise Retention	ER1	0.813	0.903	0.988	0.765
	ER2	0.788			
	ER3	0.742			
	ER4	0.781			
	ER5	0.775			
Knowledge & Understanding	KU1	0.766	0.878	0.910	0.653
	KU2	0.765			
	KU3	0.887			
	KU4	0.875			
	KU5	0.843			

4.2 Discriminant Validity

After establishing the convergent validity and reliability of the measuring scales, we proceeded to examine the discriminant validity of the variables. The study conducted by Fornell and Larcker included a similar examination of the variables' discriminant validity through a criterion of the correlation coefficients between latent constructs in the measurement model. The latent variables' correlation coefficients, which were visually assessed in the correlation matrix of the measurement model, should be less than the square root of the AVE values for the latent variables, as stated in the study byHair, Sarstedt (35). Additionally, we tested the latent variables to identify discriminant validity. Hair, Sarstedt (35)explained, an indicator's loadings should be greater than the loadings of each of its cross-loadings; therefore, the discriminant validity is reported in Table 3.

Table 3. Assessment of discriminant validity.

Constructs	1	2	3	4	5	6	7	8
Physical Activity Behaviour	0.789							
Sports Participation	0.714	0.776						
Physical Fitness	0.634	0.723	0.756					
Sedentary Behaviour	0.666	0.654	0.653	0.793				
Functional Training Program	0.704	0.742	0.664	0.754	0.786			
Confidence	0.624	0.728	0.725	0.718	0.556	0.771		
Exercise Retention	0.622	0.665	0.719	0.653	0.742	0.751	0.743	
Knowledge & Understanding	0.642	0.675	0.668	0.532	0.674	0.656	0.609	0.813

4.3 Assessment of Structural Model

The SRMR, or Standardized Root Mean Square Residual, is a widely used absolute fit index in structural equation modeling, including PLS-SEM. The standardized root mean square residual (SRMR) value was one method of assessing the model fit (35). The model's SRMR of 0.086 indicates that the model has an excellent model fit.

Table 4 shows the results of the mediation analysis performed in SmartPLS (35) which looked at the direct and indirect effects of the Functional Training Program on Physical Activity Behavior through Confidence, Exercise Retention, and Knowledge & Understanding. The analysis utilized a bootstrapping procedure (i.e., 5,000 bootstrap samples) to evaluate the variance in the indirect path coefficients generated. In SmartPLS, the path coefficients (β) describe the strength and direction of the relationships among the variables. The t-value (not shown on this table, but an important part of SmartPLS output) and p-value can then be used to determine the statistical significance of each path. A p-value of less than 0.05 (0.01 if statistically significant) demonstrates a statistically significant relationship. The 95% confidence interval for the indirect effects is the key output to assess for mediation the confidence interval does not include zero indicates that there is a significant mediating effect.

Table 4. Direct and Indirect Effects

Relationships	Path Coefficient	Mean (M)	Standard Deviation (SD)	T Values	P Values
H1: FTP -> Confidence	0.624	0.618	0.052	11.962	0.001
H2: FTP -> ER	0.755	0.751	0.063	8.575	0.001
H3: FTP-> K&U	0.684	0.678	0.065	10.654	0.000
H4: Confidence->PAB	0.543	0.543	0.054	6.875	0.000
H5: ER->PAB	0.498	0.419	0.041	10.541	0.000
H6: K&U->PAB	0.571	0.549	0.059	7.643	0.000
H7: FTP -> Confidence->PAB	0.486	0.478	0.046	5.687	0.002
H8: FTP -> ER->PAB	0.522	0.519	0.051	7.347	0.000
H9: FTP-> K&U->PAB	0.448	0.437	0.041	5.653	0.004

5. Discussion and Conclusion

This study sought to explore the effect that a Functional Training Program (FTP) had on physical activity behaviour (PAB) in inactive school-aged children, and that the effect was achieved through the mediating influences of confidence, exercise retention, and knowledge & understanding. The SmartPLS analysis provided considerable support for the proposed model, and these findings shed light on how behaviour change occurs in this population. The proposed hypotheses are outlined below.

The results reported for Hypothesis H1 FTP→ Confidence. This finding is consistent with previous research which provides evidence that a well-organized and enjoyable physical activity intervention enhances a child's self-efficacy and perceived competence. Confidence affirms that the program effectively enhanced the essential psychological need for Competence. When a program is activity-based and includes mastery experiences and provides constructive and positive feedback during the acquisition of functional movements, it provides the optimal environment to strengthen a child's self-efficacy (36). The way the FTP was designed, likely created a context for mastery experiences and positive feedback, which was a contributing factor to the process and emphasizes the need to focus on confidence development to influence the

behavior of inactive youth. The results of Hypothesis H2 show the path FTP→ Exercise Retention. Similar to related research studies, the FTP was successful in getting participants to continue with their physical activity journey after the completion of the program. This behaviour is consistent with research that demonstrates some of the program features, including, autonomy support and relatedness, are related to retention in youth fitness programs. Exercise retention provides behavioral evidence of successful internalization of motivation. Activity continuation post-program completion suggests that the FTP met the participants' basic psychological needs for Competence, Autonomy, and likely Relatedness (through a supportive social context), transforming externally regulated behavior into autonomous motivation (37). Retention of youth participants is an essential component in any successful approach aimed at reducing sedentary struggles. Hypothesis H3 show the path FTP→ Knowledge & Understanding. This indicates that the program successfully imparted essential health literacy. By teaching children about the benefits of physical activity and empowering them with the knowledge to make informed health decisions, the FTP reflects a comprehensive approach. This is in line with literature that emphasizes the importance of both knowledge acquisition and its practical application for effective and lasting behavioral change (38). Knowledge & Understanding signifies the successful promotion of Competence (through cognitive resources) and Autonomy. Ensuring children understood the rationale and benefits of a physically active lifestyle, the FTP provided the informational choice that moves beyond demonstration, related to an individual's sense of volition.

The results from H4 suggest a path confidence → PAB. This supports a core tenet of SDT that perceived competence is a significant contributor to physical activity. This is directly connected to one of the primary principles of SDT whereby the Basic Psychological Need for Competence is a strong motivator for engagement. For inactive school aged youth to develop confidence in their ability to perform physical activities they are less likely to be sedentary, and more likely to engage in sport and fitness activities. Overall, our findings exemplify the importance of psychological factors in overcoming barriers to physical participation (39). The results of H5 suggest that Exercise Retention → PAB. The significance of this finding is that it suggests that ongoing engagement in the program was a direct and robust predictor of improved physical activity behavior. The ongoing participation of schoolchildren in the FTP provided schools and local communities with higher levels of overall physical activity participation in their lives. This suggests that public health can and should develop programs educationally for retention as the foremost goal, as this retention is the process through which significant public health outcomes can be achieved (29). According to SDT, it emphasizes the value of maintaining engagement. This may be the most important result for public health, indicating the direct and strong association between sustained engagement with the FTP and increased overall physical activity levels over the lifetimes of schoolchildren. This retention is the process through which basic psychological needs (Competence, Autonomy, and Relatedness) are continually satisfied, facilitating long-term positive behavior change. The results for Hypothesis H6 also indicate Knowledge & Understanding→ PAB. This emphasizes the possible usefulness of educating children about physical activity. If children learn to develop a connection to their actions related to physical activity and health, they are more likely to integrate them into their lives. These results confirm a cognitive-behavioral strategy for health promotion which privileges knowledge as the basis of an intentional, and enduring, behavior change (25). According to SDT, it highlights the benefits of an autonomy-supportive, cognitive-behavioral approach to health promotion. The FTP, by building children's health literacy, allows them to form an intentional self-connection to their behaviors.

The test for Hypothesis H7 shows FTP→ Confidence → PAB. This outcome is important for the heart of the study, as it identifies the psychological mechanism of intervention. The FTP does not work only because the children are exposed to physical activity, but because it is consistently increasing their confidence. The increase in PAB is a direct result of the increased confidence, supporting the notion that successful physical activity programs for sedentary youth need to consider psychological mediators (40). Hypothesis H8 result shows FTP→ Exercise Retention → PAB. This presents a central reason as to why the FTP increased PAB, which was its ability to keep the members and retain them. Involvement with the FTP program resulted behavior change. This information illustrates the need to have programs that are effective on top of fun and engaging, so that the participants stay in the activity as a major objective in successful interventions with sedentary populations (41). Lastly, FTP→ Knowledge & Understanding → PAB the results of Hypothesis H9. This highlights that the educational component of the FTP was the catalyst for behavior change. The program gave children the knowledge

and cognitive skills to make the right decisions about their health, which ultimately led to increased physical activity. This reinforces a comprehensive intervention model that combines cognitive and physical interventions into a coherent approach to get lasting behavior change (6).

5.1 Implications of Study

5.1.1 Theoretical Implications

This study makes an important contribution to Self-Determination Theory (SDT) by establishing empirical evidence for the process through which autonomy, competence, and relatedness are facilitated in a structured fitness program. The present research presents indices of evidence that confidence building (a proxy for competence), exercise retention (a reflection of persisting autonomously motivated purposes), and knowledge (both in perceived control and internal regulation) are all significant and quantifiable aspects of an effective intervention. The present research illustrated the mediating influences of these constructs, and advances the evidence-based application of SDT in school physical activity program design. A corollary of the present study accords with applying a satisfaction of psychological needs framework as a viable means for inducing significant behavior change among children. Besides contributing to SDT, the present study adds to behavior change theory literature through the application of an in-depth mediation technique (15). The added supporting evidence, argued that the FTP's success was not merely due to exposure to physical activity in a direct manner, but was a nets effect of the psychological and behavioral shifts from the combined FTP. This differs importantly from simple pre-post studies vs. more complex statistical approaches to determining the "how" and "why" of successful interventions

5.1.2 Practical Implications

The implications of this research is easy and tangible for physical education teachers, school staff, and public health officials. Coaches and physical activity leaders which are identify participants' motivational profiles using motivation assessments created for this purpose. This step is crucial to guide your program's specific motivational strategies. For educational policymakers focus from time on task to quality of motivation. Require professional development of PE teachers that focus on SDT-based practices, particularly how to support autonomy by offering meaningful activity choices and explaining the rationale behind skill development. For physical education teachers are intentionally design lessons to maximize mastery experiences and deliver feedback that encourages Competence ("You improved because you focused on your core" versus "Good job!"). Moreover, focus on Relatedness by creating a supportive, low-competitive class climate since the social connection is important for children, adolescents and youth retention. For public health practitioners are developing community-based programs like the one above, have dedicated time to educate participants on health literacy. Programs should help participants develop skills, but also the Knowledge & Understanding so they can advocate for their own health, self-monitor their exercise behavior, and make self-determined, autonomous choices related to their physical activity after the program ends.

This research tells us that we can address school children if we wish to address the problem of inactivity, (27)in addition to a sport-specific intervention, and address skill acquisition and educational aspects. Physical education curricula must be reformatted in part with a specific emphasis on building children's confidence through mastery-based tasks in addition to being positive reinforcement givers simultaneously, and introducing children to educational elements of health literacy that will enable them to make better decisions regarding their own health and activity levels beyond the walls of school. The high retention of exercise in this research provides an example of how to formulate the development plan for exercise programs. The plan or intervention needs to be enjoyable and adaptable enough for children to feel more ownership and personal meaning about participating in a program. The higher these levels of ownership and connection are, the more sustainable the intervention will be. If schools emphasize enjoyment and adaptability, they not only will contribute to increasing children's physical activity in the short term, but ultimately provide children with both the skills and motivation to be responsible for pursuing active living and overall health still years later.

5.2 Limitations and Future Research

The findings of this study are limited in various ways. First, despite utilizing a robust mediation model that provided compelling support for the link between the proposed variables, the sample dealt exclusively with inactive schoolchildren, and therefore the extent to which the findings can generalize to other people or age groups is

restricted. Second, the study relied on self-reported measures for some variables that were susceptible to social desirability bias. Future research utilizing more objective measures of physical activity (e.g., accelerometers) could help substantiate findings. Moving forward, future research should seek to replicate this model in a number of different populations, such as individuals from different cultural backgrounds or different socioeconomic levels, to assess the ability to generalize the findings. Future research should be conducted to assess the long-term effects of the FTP on PAB well beyond the intervention period, to see if the behavior change can be maintained. Finally, future studies examining additional possible mediators (e.g., social support from peers or parents) would be another route to strengthen the understanding of the multifaceted nature of physical activity behaviour as it relates to children. Finally, it is important to note that the N=90 sample. Thus, any interpretations of the mediation results should be done with caution. A larger-scale study would be advisable if one were to try to generalize these results to a larger population.

Authors' Contributions

The author, Asia Bano, was responsible for the conceptualization, methodology, data collection, formal analysis, visualization, and preparation of the original draft of the manuscript. Dr. Eliza Hafiz, Associate Professor, Dr. Sareena Hanim, and Dr Farooq Ahmed Jaam provided continuous supervision, constructive feedback, and approved the final version of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

This research has been approved by the University Malaya Research Ethics Committee (UM. TNC2/UMREC_3831) and the School Education Department (SED. Memo No.227/G. B).

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