

PHYSICAL Activity, Behavioral Regulation, and Physical Fitness of Grade 10 Students in Public Secondary HIGH SCHOOL

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ABSTRACT

The purpose of the study was to determine the physical activity, behavioral regulation, and physical fitness of grade 10 students in a public secondary high school. The study used quantitative, descriptive-correlational, and descriptive designs with grade 10 students from different schools in Carmen, Division of North Cotabato. Several adapted instruments were used from various authors. Mean, standard deviation, and Pearson's r were used to analyze the data. The results revealed the following: physical activity was high; behavioral regulation was very high and was described as very good; and physical fitness was high. No significant relationships were found between physical activity and physical fitness or between behavioral regulation and physical fitness.

KEYWORDS: *Physical activity, behavioral regulation, physical fitness, grade 10 students Public secondary high school, Philippines*

INTRODUCTION

Physical fitness is a crucial indicator of health and well-being, defined as the ability to perform daily tasks with energy and without undue fatigue (Tremblay et al., 2010; Booth et al., 2012). Despite these findings, a large portion of the global population, including 31% of adults and 80% of adolescents, fails to meet recommended physical activity levels, placing many at risk for health complications (WHO, 2024). Factors contributing to this decline include mechanization, reduced time for exercise due to work and leisure habits, increased screen time, and limited access to recreational spaces (Demirci et al., 2025; Ávalos-Ramos et al., 2024).

Studies in Japan highlight declining fitness levels among schoolchildren linked to sedentary lifestyles, increased electronic device use, reduced school club participation, and rising childhood obesity (Japan Sports Agency, 2019). Similarly, Filipino youth exhibit low levels of physical activity, largely due to academic pressures and reliance on motorized transport (Palad et al., 2023; Active Healthy Kids Global Alliance, 2022; Sallis et al., 2016). The COVID-19 pandemic further exacerbated inactivity due to mobility restrictions and remote learning (Manosa et al., 2022).

Research consistently shows a positive relationship between physical activity and physical fitness, with higher levels of activity associated with better fitness (Cuberos et al., 2020; Akhmad et al., 2024). Behavioral regulation—encompassing attention, memory, and self-control—is also important, as greater self-regulation fosters stronger intentions and better outcomes related to physical fitness (McClelland et al., 2010; Khalkhali, 2012; Wierdsma, 2024).

While existing studies have explored physical activity and behavioral regulation separately, there is a gap in research addressing their combined influence on physical fitness, especially among grade 10 students in Carmen, North Cotabato. School-based physical activity programs have been shown to improve fitness components like endurance and strength (Ługowska et al., 2023; Ruedl et al., 2018), and higher self-regulation skills correlate with better fitness outcomes (Trost & van der Mars, 2017; Zhang et al., 2022).

This study aims to fill this gap by examining how physical activity and behavioral regulation together impact the physical fitness of grade 10 students in Carmen. The findings could inform local educational programs to promote student fitness and support broader goals, such as the United Nations' 16th Sustainable Development Goal for inclusive and effective institutions. To proceed, the researcher plans to disseminate the results through faculty and district meetings, Learning Action Cell (LAC) sessions, parent and teacher association meetings, and division meetings. Then, the researcher plans to present this research at both national and international research conferences. Moreover, the researcher intends to publish this study in a peer-reviewed or appropriate journal for wider dissemination.

Statement of the Problem

1. What is the level of physical activity among students in terms of knowledge,

- environmental context, motivation and goals, beliefs about capabilities, skills, emotion, social influences, beliefs about consequences, action planning, coping planning, and goal conflict?
2. What is the level of student's behavioural regulation in terms of external regulation, introjected regulation, identified regulation, intrinsic regulation, and amotivation?
 3. What is the level of physical fitness of students in terms of speed, power, agility, reaction time, coordination, and balance?
 4. Is there a significant relationship between physical activity and physical fitness, and behavioural regulation and physical fitness?
 5. Does physical activity and behavioural regulation significantly influence the physical fitness?

METHODOLOGY

Research Design. This study utilized a quantitative research design, specifically a descriptive correlational approach, to systematically examine the relationships among physical activity, behavioral regulation, and physical fitness in grade 10 students. Quantitative research involves collecting and analyzing numerical data to test objective theories by measuring variables and applying statistical analysis (Bhandari, 2020; Creswell, 2014).

Descriptive research was employed to observe and describe students' physical activity levels, behavioral regulation types, and physical fitness, without influencing these factors (Shuttleworth, 2020; Creswell, 2014). Additionally, the correlational design measured how these variables relate to one another, aiming to identify connections and predict naturally occurring relationships among physical activity, behavioral regulation, and physical fitness (Kowalczyk, 2015). This approach enabled the study to determine the strength and direction of associations among the key variables.

Research Locale. The study was conducted in Carmen, a first-class municipality in Cotabato, Philippines, chosen for its accessibility to the target respondents. Three large junior high schools within Carmen, coded as Schools A, B, and C, were selected based on their sufficient number of Grade 10 students to meet the study's sample size requirements. These schools were also identified by MAPEH teachers as having low physical fitness test scores in the 2022-2023 school year, making them suitable for investigating the relationship

between physical activity, behavioral regulation, and physical fitness.

Research Respondents. The respondents in the study were grade 10 junior high school students from different participating public secondary schools in the Division of Carmen, North Cotabato. The distribution profile of the schools is as follows: School A has a population of 563, School B has a population of 175, and School C has a population of 57. A total of 796 grade 10 students were involved in the study. The researchers used the online Raosoft calculator with a 5% margin of error, a 95% confidence interval, and a 50% response distribution to select a total of 90 junior high school students for the study. A simple random sampling technique was used to ensure that every student had an equal chance of being selected. Ratios and proportions were computed to determine the population size for each participating school.

Research Instrument. The study used a survey questionnaire and a physical fitness test as the main instruments. The questionnaire was validated through a pilot test with 30 students, showing strong reliability for the Physical Activity Questionnaire (Cronbach's $\alpha = 0.86$) and acceptable reliability for the Behavioral Regulation Questionnaire (Cronbach's $\alpha = 0.75$).

The first part measured physical activity using the Determinants of Physical Activity Questionnaire (Taylor et al., 2013), covering motivation, social influences, and goal planning, with 34 items rated on a 5-point Likert scale from 1 (very low) to 5 (very high).

The second part assessed behavioral regulation using the Behavioral Regulation in Exercise Questionnaire (Havnen et al., 2023), comprising 18 items across different motivation types, rated on a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree), with a reliability of 0.78. The third part measured physical fitness using the Revised Physical Fitness Test (PFT) Manual (Department of Education, 2019), which assesses speed, power, agility, reaction time, coordination, and balance through 6 items validated for students.

Statistical Tools. The researcher tested all statistical treatments at a .05 level of significance. The mean was used to determine the average of the responses, while the standard deviation was utilized to assess the variability or disparity of the data. Pearson's correlation was used to analyze relationships among variables, and multiple regression was used to determine whether

physical activity and behavioral regulation significantly influence physical fitness.

Ethical Considerations. This study was submitted to the University of the Immaculate Conception-Ethics Review Committee (UIC-REC) for review to ensure compliance with the proper protocol. The Ethics and Research Board focused primarily on upholding the research protocol by safeguarding the data's validity and the dignity of the people involved in this study. The quality of this research project was based on the researchers' ability to present valid arguments to readers and to present the data fairly. Ethical standards in research avoid the fabrication and falsification of data. It enabled the pursuit of knowledge and truth to be the primary goal of this research.

RESULTS AND DISCUSSION

Level of Physical Activity of Grade 10 students

The data in Table 1 reveal that Grade 10 students exhibit a high level of physical activity, with an overall mean of 3.73 and a low standard deviation of 0.38, indicating consistent and frequent engagement across the group. This suggests that students recognize the value of physical activity and actively participate in it, likely influenced by supportive school programs, social encouragement, and personal motivation. These findings are consistent with studies by Kohl & Cook (2013) and Zhang et al. (2024), which highlight the role of structured routines and the positive impact of regular physical activity on adolescents' physical and psychological well-being.

Table 1
Level of Physical Activity of Grade 10 students

Indicators	Mean	SD	Description
Knowledge	3.89	.50	High
Environmental Context	3.97	.91	High
Motivation and Goals	4.24	.64	Very High
Beliefs About Capabilities	4.20	.44	Very High
Skills	3.73	.66	High
Emotion	3.80	.68	High
Social Influences	3.57	.86	High
Beliefs About Consequences	4.17	.81	High
Action Planning	3.79	.73	High
Coping Planning	3.34	.56	Moderate
Goal Conflict	2.76	.60	Moderate

Overall Mean	3.73	.38	High
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Knowledge. The findings show that Grade 10 students have a high level of knowledge about physical activity, with a category mean of 3.89 and item ratings ranging from 3.49 to 4.23. While students demonstrate strong awareness of the recommended levels of physical activity—particularly evident in the highest-rated item (mean = 4.23)—the slightly lower rating for familiarity with current national guidelines (mean = 3.49) suggests some variation in specific knowledge. Overall, the results imply that students are generally well-informed, likely due to educational exposure and public health messaging. However, as noted by Wafi et al. (2024) and the WHO (2024), this awareness does not always translate into consistent physical activity, highlighting a common global gap between knowledge and behavior among adolescents.

Environmental Context. The data reveal a high category mean of 3.97, with item ratings ranging from 3.92 to 4.06, indicating that Grade 10 students generally perceive their environment as supportive of physical activity. Students rated the availability of facilities slightly higher (4.06) than the attractiveness of their local area (3.92), suggesting that structural supports like parks, sports centers, and equipment have a more significant influence on promoting physical activity than aesthetic appeal alone. This aligns with studies by Lv and Wang (2023), Ajeyalemi (2022), and Wang et al. (2025), which collectively highlight the value of safe, accessible, and well-equipped environments for sustaining adolescent physical activity. These findings are also supported by the ecological model of health behavior (Dollman, 2018), which highlights the critical role of environmental and community-level factors in shaping health-related behaviors.

Motivation and Goals. The findings show a very high category mean of 4.24, with item ratings ranging from 4.04 to 4.41, indicating that motivation and goal setting play a significant role in students’ physical activity behaviors. The highest-rated item (4.41), which reflects students feeling better when engaging in physical activity, highlights the importance of positive emotional outcomes—such as improved mood and well-being—in reinforcing their participation. Meanwhile, the consistently high ratings for feeling motivated (4.04) and wanting to be active (4.26) suggest that students not only recognize the benefits of physical activity but are also internally driven to pursue it. These results align with Antunes et al. (2024), who found that adolescents are highly motivated by personal growth, fitness, and achievement, and with the National Academies of Sciences, Engineering, and Medicine (2019), which emphasized

that adolescents often pursue task-oriented goals that enhance competence and foster intrinsic motivation.

Beliefs about Capabilities. The results show a high category mean of 3.82, with item ratings ranging from 3.43 to 4.06, indicating that Grade 10 students generally hold positive beliefs about their physical capabilities. The highest-rated item (4.06) suggests that observing others succeed in physical activity boosts students' confidence and motivation, while the lower rating (3.43) for feeling self-conscious indicates that some students still struggle with body image or confidence issues during physical activity. Overall, these findings imply a strong sense of self-efficacy among students, which aligns with Bonghawan and Macasilang (2024), who found that higher self-efficacy supports proactive behaviors and resilience in academic settings. This is further supported by Cherry (2025), who highlighted that self-efficacy plays a critical role in task initiation and persistence across academic and physical pursuits.

Skills. The results show a high category mean of 3.80, with item ratings ranging from 3.64 to 3.80, indicating that students generally perceive themselves as having strong physical activity skills. The highest-rated item (3.80) reflects confidence in their sports abilities, which appears to positively influence their participation in physical activities, while the slightly lower rating (3.64) suggests some variation in perceived competence relative to standard performance.

These findings suggest that skill proficiency is a key driver of students' engagement in physical activity. This aligns with the study of Wee and Dillon (2022), which emphasized the importance of practical competence in turning intentions into action, and is further supported by Gao et al. (2021) and Moneva and Tribunalo (2020), who found that motor skill development not only predicts sustained activity but also enhances self-confidence and enjoyment, promoting long-term participation.

Emotion. The data show a high category mean of 3.80, with item ratings ranging from 3.77 to 3.87, indicating that students generally experience positive emotions toward physical activity. Equal ratings for feeling at ease when thinking about physical activity and experiencing positive emotions (both at 3.77) suggest that emotional readiness and positivity play a consistent role in engagement, while the slightly higher rating of 3.87 for having a less stressful daily life highlights how lower stress levels enhance students' comfort and

willingness to be active. These findings align with Yu et al. (2024), who emphasized the vital role of emotional engagement in physical activity, and are supported by Shengyao et al. (2024) and Stuntz et al. (2020), who found that feelings of achievement and personal progress during exercise reinforce positive emotions and long-term commitment to physical activity.

Social Influences. The category mean of 3.57, with item ratings ranging from 3.24 to 3.81, indicates that while students receive strong emotional and verbal support from friends for physical activity, they may have fewer chances for direct social participation. This suggests that social influences play an important role in encouraging activity. Zhang et al. (2024) highlight that interpersonal encouragement significantly impacts students' engagement, supporting Bandura's (1997) idea that social modeling and verbal persuasion boost self-efficacy and participation. Similarly, Su et al. (2022) emphasize that family involvement and positive role models contribute greatly to maintaining active lifestyles.

Beliefs about Consequences. The category mean of 4.17, with item ratings ranging from 4.04 to 4.42, indicates that students hold strong positive beliefs about the benefits of physical activity, both short-term (e.g., better sleep, burning calories) and long-term (e.g., weight loss, longevity). The highest rating (4.42) reflects students' belief that physical activity improves overall life quality. These findings align with Zhang et al. (2024), Shorey & Lopez (2021), and Rubis (2016), who all emphasize that understanding the positive outcomes of exercise significantly motivates adolescents to engage in and maintain physical activity. Herbert et al. (2019) also support that perceiving exercise as beneficial to well-being encourages sustained participation.

Action Planning. The category mean of 3.79, with item ratings ranging from 3.13 to 4.00, indicates that students generally engage in action planning for physical activity, with higher comfort with being flexible about timing (4.00) than with managing logistical details like transportation and equipment (3.61). This suggests a proactive but variable approach to planning.

These findings align with Schmitt and Prasastyoga (2024) and Hou et al. (2022), who highlight that structured, goal-oriented planning and strategies to overcome barriers significantly enhance the likelihood of sustained physical activity among adolescents.

Coping Planning. The category mean of 3.34, with item ratings ranging from 3.13 to 3.68, indicates that Grade 10 students demonstrate a moderate level of coping planning related to physical activity. While they sometimes get distracted from their planned activities (3.13), they show a stronger ability to manage difficult situations and follow through with plans (3.68). This suggests students have some capacity to anticipate and overcome barriers, though there is room to enhance their resilience. Agonia and Tenorio (2024) found that experience and problem-solving guidance improve coping planning, supporting Freire et al.'s (2020) observation that self-regulation and support systems boost this skill. Additionally, Sides and Cuevas (2020) highlight that educational interventions focused on goal-setting and anticipatory coping effectively strengthen coping planning.

Goal Conflict. The category mean of 3.16 to 3.62, with an overall moderate rating of 2.76, suggests that Grade 10 students experience moderate goal conflict between physical activity and other priorities, such as socializing and leisure. While some students are willing to sacrifice leisure time for physical activity (3.16), others prefer spending time with friends (3.62), indicating competing demands.

Bray and Harris (2025) found similar moderate goal conflict, showing that such conflicts do not severely disrupt activity when students use effective self-regulation. This aligns with Swann et al. (2019) and Koessmeier & Büttner (2021), who note that goal conflict only becomes a major barrier when it consistently distracts from important health goals.

Level of Behavioral Regulations of Grade 10 Students

Table 2 shows that students' behavioral regulation has a very high overall mean of 4.41, indicating that they consistently demonstrate strong self-regulation during physical activities. This suggests that students are motivated mainly by internal factors—such as personal satisfaction and valuing the benefits of exercise—rather than external pressures. The low standard deviation of 0.41 indicates that students' responses are closely aligned, reflecting a shared understanding and similar motivational patterns.

These results support Deci and Ryan's (2017) theory that intrinsic motivation and identified regulation strongly predict sustained physical activity in adolescents. The findings also align with El Omda and Sergent (2025), who noted that low response variability indicates a common behavioral orientation

among participants.

External Regulation. The mean ratings for items on external regulation range from 2.81 to 3.81, with an overall category mean of 3.32, indicating a moderate influence of external regulation on students’ physical activity behaviors. Specifically, students sometimes exercise to please others or because of external encouragement, but this motivation is not consistently strong. This suggests that while social approval and external incentives play a role in driving their physical activity, these factors alone may not sustain long-term engagement. This finding aligns with Deci and Ryan (2017), who noted that moderate external regulation reflects motivation influenced by social pressures or rewards, which can maintain short-term participation but may lack the autonomy necessary for lasting commitment. It also supports Bandhu et al. (2024) and Hagger et al. (2014), who emphasized that behaviors primarily driven by external contingencies tend to decline once those external motivators are removed.

Table 2
Level of Behavioural Regulations of Grade 10 Students

Indicators	Mean	SD	Description
External Regulation	3.32	.99	Moderate
Introjected Regulation	2.66	.96	Moderate
Identified Regulation	4.20	.74	Very High
Intrinsic Regulation	3.96	.76	High
Amotivation	1.98	.77	Low
Overall Mean	4.41	0.41	Very High

Introjected Regulation. The mean ratings for items on introjected regulation range from 2.48 to 2.86, with an overall category mean of 2.66, indicating a moderate level of introjected regulation influencing students’ physical activity behaviors. Specifically, students sometimes feel guilty or like failures when they do not exercise, but these internal pressures are not dominant motivators. This suggests that while feelings like guilt and self-imposed expectations partly drive their physical activity, these motivations may not fully support consistent or autonomous engagement. This finding aligns with Zhong and Wang (2019), who noted that moderate introjected regulation reflects controlled motivation driven by internal pressures, which can promote activity but may undermine long-term well-being. It also supports Ryan and Deci (2017) and Uzun and Aydemir (2020), who emphasized that introjected regulation, although more internalized than external regulation, still lacks full autonomy

and can lead to fluctuating adherence.

Identified Regulation. The mean ratings for items on identified regulation range from 4.13 to 4.27, with an overall category mean of 4.20, indicating a very high level of identified regulation among students. Specifically, students engage in physical activity with joy during group activities and recognize the importance of making an effort to exercise. This suggests that grade 10 students are motivated by a strong personal understanding of the value and benefits of physical activity for their health and well-being.

This finding aligns with Ryan and Deci (2017), who highlighted that identified regulation reflects a more autonomous form of motivation, leading to sustained engagement and greater behavioral consistency. Furthermore, high levels of identified regulation are associated with improved psychological well-being due to the internalization of health-related goals.

Intrinsic Motivation. The mean ratings for items on intrinsic regulation range from 3.83 to 4.12, with an overall category mean of 3.96, indicating a high level of intrinsic motivation among students. Specifically, students find exercise pleasurable and engage in physical activity because it is fun. This suggests that students experience positive emotions and enjoyment during physical activity, which supports sustained and self-determined engagement. This finding aligns with Deci and Ryan (2017), who emphasized intrinsic motivation as the most autonomous and enduring form of motivation linked to continued participation. It also supports Antunes et al. (2020), who found that intrinsic motivation in physical education predicts greater future exercise intentions and consistent lifelong physical activity habits.

Amotivation. The mean ratings for items on amotivation range from 1.47 to 2.34, with an overall category mean of 1.98, indicating a low level of amotivation toward physical activity among students. Specifically, students generally do not view exercise as a waste of time or meaningless. This suggests that they have clear intentions and meaningful reasons for engaging in physical activity. This finding aligns with Ryan and Deci's (2017) finding that low amotivation reflects strong self-determined motivation. It also aligns with Bandhu et al. (2024), who emphasized that low amotivation indicates well-internalized motivation and is consistent with Aljumah (2023), who found that low amotivation is linked to greater autonomy, competence, and value alignment, which promote sustained engagement.

Level of Physical Fitness of Grade 10 Students

In Table 3, the overall mean physical fitness of students is 3.53, which is described as high, indicating generally good physical fitness across the measured components. Students show satisfactory performance in tasks requiring agility, reaction time, balance, power, speed, and coordination, though proficiency varies by area. Notably, speed (mean = 2.21) and coordination (mean = 2.04) are rated low, while balance (mean = 4.98) and agility (mean = 4.38) are rated very high. This suggests that although students are generally fit, targeted interventions are needed to improve their speed and coordination skills.

Table 3
Level of Physical Fitness of Grade 10 Students

Indicators	Mean	SD	Description
Speed	2.21	.86	Low
Power	3.30	.78	Moderate
Agility	4.38	.68	Very High
Reaction Time	4.26	.83	Very High
Coordination	2.04	1.02	Low
Balance	4.98	.15	Very High
Overall Mean	3.53	.38	High

The overall standard deviation of physical fitness scores is 0.38, indicating that students’ fitness levels in speed, power, agility, reaction time, coordination, and balance are closely clustered around the mean. This suggests a relatively consistent and homogeneous group in terms of fitness abilities. This finding aligns with Chu et al. (2019) and Christiansen et al. (2018), who noted that similar physical activity opportunities and access to fitness resources lead to uniform performance among students.

Among the fitness components, coordination had the lowest mean score (2.04, SD = 1.02), suggesting weaker coordination skills that may hinder smooth, efficient movement. This aligns with Hardy et al. (2023) and Stanković et al. (2023), who found that adolescents often have lower motor coordination than in other fitness areas, underscoring the need for targeted physical education programs.

Conversely, balance scored very high (mean = 4.98, SD = 0.15), showing a strong ability to maintain body equilibrium. This supports the findings of Kovačević et al. (2024), who highlighted balance as a well-developed and critical fitness component in adolescents, given neurological

and muscular development during this stage.

Significance of the Relationship of Physical Activity, Behavioral Regulation and Physical Fitness of Grade 10 Students

The correlation between physical activity and physical fitness is weak and negative ($r = -0.06$; $p = 0.54$), which is greater than the alpha level of 0.05, indicating a statistically non-significant relationship. This suggests that increases in physical activity levels are associated with a negligible decrease in physical fitness, a finding that is unexpected and considered insignificant. Measurement limitations or low data variability may have influenced this result.

This finding contradicts Kohl and Cook (2013), who reported a positive correlation between physical activity and physical fitness, suggesting that higher physical activity is associated with better fitness outcomes. It also contrasts with Drenowatz et al. (2020), who found significant positive associations between physical activity and fitness measures such as aerobic capacity and agility, suggesting that other factors may play a more prominent role in determining physical fitness than physical activity levels alone.

Table 4
Significance of Relationship of Physical Activity, Behavioural Regulations, and Physical Fitness of Grade 10 Students

Paired Variables	r	p-value	Remarks
Physical Activity and Physical Fitness	-0.07	.54	Not Significant
Behavioural Regulation and Physical Fitness	-0.16	.14	Not Significant

The relationship between behavioral regulation and physical fitness shows a weak negative correlation ($r = -0.16$) that is not statistically significant ($p > .05$). This indicates that, as behavioral regulation increases, there is a slight, insignificant tendency for physical fitness to decrease. This suggests that students with higher behavioral regulation might have marginally lower physical fitness scores, but the evidence is too weak to draw firm conclusions.

This finding aligns with Ryan and Deci (2017), who noted that while self-determined motivation strongly predicts physical activity participation, it does not necessarily translate directly into improvements in physical fitness unless the activity is performed with adequate intensity and frequency. Similarly, Sanaeinasab (2020) found that motivational regulations influence

intentions and self-reported activity but have weaker direct links to objective fitness outcomes.

A potential limitation of this study is reliance on self-reported measures of physical activity and behavioral regulation, which may be subject to social desirability bias, in which respondents might over-report positive behaviors to align with perceived social expectations.

Overall, this evidence supports integrating the Theory of Planned Behavior (TPB) and Self-Determination Theory (SDT), which distinguish between motivation and actual performance outcomes. Motivation provides the psychological foundation for action, but measurable fitness gains depend on consistent, sufficiently demanding physical activity (Zhang et al., 2025). The data imply that although students may be behaviorally ready to engage in physical activity, improvements in physical fitness also rely on factors such as program design, exercise intensity, and environmental support.

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