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The Influence of Physical Activity and Dietary Habits to BMI

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Abstract

This quantitative study investigated the influence of physical activity determinants and dietary habits on the Body Mass Index (BMI) of tertiary students enrolled in physical education courses in DACS-affiliated schools in Region XI. Using data from a stratified random sample of 300 students, physical activity determinants registered a high overall mean ($M = 3.74$) across domains including knowledge, environmental resources, motivation, capability, skills, and self-regulatory factors. Dietary habits showed a moderate overall mean ($M = 3.24$), indicating inconsistent adherence to recommended nutritional practices.

BMI classification based on Asia–Pacific cutoffs revealed that 38.2% of students fell within the normal range, while 21.9% were underweight, 15.0% were overweight, and 24.9% were obese, indicating that a majority were outside the healthy BMI category. Multiple regression analysis demonstrated that physical activity determinants significantly and negatively predicted BMI ($\beta = -0.16$, $p = 0.012$), whereas dietary habits significantly and positively predicted BMI ($\beta = 0.13$, $p = 0.038$). Together, these variables accounted for 1.8% of the variance in BMI ($R^2 = 0.018$), with the overall model reaching statistical significance ($F = 3.469$, $p = 0.032$).

These findings highlight the measurable impact of physical activity-related factors and dietary behaviors on BMI while indicating that additional unmeasured variables may contribute substantially to weight-related outcomes in this population.

Keywords: Body Mass index; BMI; physical activity determinants; dietary habits quantitaive analysis, tertiary students, Asia-Pacific BMI classification; physical education; Philippines

1. Background of the Study

Obesity has become more than just a personal health issue; it is now a global crisis that affects millions of lives. It is a long-term condition marked by the excessive accumulation of body fat, which can lead to serious health complications and even premature death. Alarmingly, research has shown that nearly one in three people worldwide are now classified as overweight or obese, as highlighted by Garvey (2018) and further supported by Chooi and colleagues (2018). To keep track of this growing problem, health professionals often turn to a tool called Body Mass Index, or BMI. It is a simple calculation based on height and weight that helps categorize individuals into four main groups: underweight, normal weight, overweight, and obese. While most of the attention is on the rising cases of obesity, being underweight can also bring its set of health risks, something that is often overlooked. Because it is easy to use and does not require expensive equipment, BMI has become a key method for monitoring health trends in populations (Rafael, 2017). But with more people facing weight-related issues, from heart disease to diabetes, the call for stronger prevention efforts and well-planned health programs has never been more urgent. Tackling this challenge means looking at both ends of the spectrum, underweight and obesity, and creating solutions that support better health for everyone (Gregg & Shaw, 2017).

Across countries like the United States, the United Kingdom, India, and Australia, BMI-related health issues, particularly those involving obesity and underweight, continue to pose serious challenges. In the U.S., although programs like the Healthy, Hunger-Free Kids Act led to slight improvements in childhood BMI, about one in five children still struggle with excess weight (Ford & Panzera, 2024). In the U.K., adults with higher BMIs were especially affected during the COVID-19 lockdowns, reporting less physical activity, more snacking, and a general decline in diet quality, all factors that made weight management even more difficult (Robinson et al., 2020). Meanwhile, in India, a worrying number of people either live with elevated BMIs or fail to get enough physical activity. Around 20% of adults are completely inactive, and the average BMI hovers near 24.7 kg/m^2 , just below the threshold for being classified as overweight. This places many at risk for noncommunicable diseases (Podder et al., 2020). Australia presents a slightly different picture: most university students get enough physical activity, but poor dietary choices, low intake of fruits, and heavy reliance on processed foods still contribute to unhealthy BMI levels. While we commonly discuss obesity, we often overlook the serious health risks that underweight individuals face in mainstream conversations. Altogether, these global trends reflect a broader concern: whether it is being significantly underweight or overweight, poor BMI outcomes are closely tied to everyday behaviors, and addressing them requires more than just general health advice; it calls for targeted, sustainable action.

In the Philippines, adults face a growing double burden of malnutrition, with both obesity and undernutrition posing serious health risks. Based on the 2018-2019 Expanded National Nutrition Survey conducted by the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI), approximately one-third of Filipino adults are classified as overweight or obese, while around 10 percent remain underweight, with a Body Mass Index (BMI) of less than 18.5 kg/m^2. Alarmingly, the prevalence of obesity among adults has nearly doubled over two decades, from 20.2 percent in 1998 to 37.2 percent even as chronic energy deficiency continues to affect an estimated 11.8 percent of the elderly population. The nutrition challenges extend to younger age groups as well; in 2019, nearly 29 percent of children under five were found to be stunted, and approximately 19 percent were underweight. These coexisting trends of overnutrition and undernutrition reflect a complex national health landscape, underscoring the need for integrated strategies that address both obesity and underweight conditions across different age groups.

In Davao City, more young people are now falling outside the healthy BMI range, either overweight/obese or underweight; this has become a growing concern for their long-term health. These issues extend beyond mere appearance; they serve as early warning signs for serious conditions such as heart disease, diabetes, and other chronic illnesses. A recent study by Calumba et al., (2023), showed that many adolescents, whether underweight or overweight/obese, tend to have poor vegetable intake, missing out on key nutrients that are vital for healthy growth. This pattern suggests that healthy food choices might not be a priority or easily available for many families. However, Silguera (2024) found that among college students, things like skipping meals, not getting enough exercise, and staying up late were all linked to unhealthy BMI levels. These findings point to a growing need for more focused health programs in schools and communities, programs that promote nutritious eating and encourage young people to stay active and take better care of their overall well-being.

Body Mass Index (BMI) is still one of the simplest and most commonly used ways to get a quick sense of whether someone's weight is within a healthy range for their height. Because it is simple to calculate and doesn't require expensive tools, BMI has become a go-to method for identifying people who may be at risk for health problems related to being underweight or overweight (Masters, 2023). In fact, BMI is widely used by researchers and health officials around the world to monitor obesity trends, compare data across populations, and shape public health strategies (Lim et al., 2020). While it does not measure fat or muscle directly, it still offers a practical starting point for flagging potential health concerns (Crow et al., 2020). When paired with other health checks, BMI remains a valuable tool for raising awareness, supporting early intervention, and helping guide people toward better health outcomes.

With ore adults facing challenges related to obesity and leading increasingly inactive lifestyles, it has become more urgent than ever to take a closer look at the habits that influence Body Mass Index (BMI) and overall health. Physical activity is one of the most important lifestyle factors for controlling weight gain (Guthold et al., 2019). A growing body of research shows that sedentary routines and lack of movement are strongly associated with higher BMI and an increased risk of metabolic disorders (Muzenda et al., 2021). The World Health Organization (2020) also says that staying active is good for both the body and the mind. But BMI isn't shaped by movement alone; it is a more complex picture. For example, even individuals who are physically active may struggle with fitness if their body fat levels remain high (Söğüt et al., 2019). Individuals with elevated BMI frequently exhibit diminished performance in physical fitness assessments, indicating the significance of regular exercise in enhancing not only weight but overall physical function over time (Sung et al., 2020). Yet exercise on its own may not be enough. A large-scale study from China found that many individuals who worked out regularly still had trouble managing their BMI when their eating habits were poor, highlighting how important it is to consider both physical activity and diet and aim for long-term weight and health improvements (Zhang et al., 2025).

Dietary habits play a major role in shaping a person's Body Mass Index (BMI), especially during the teenage years and early adulthood when long-term dietary patterns tend to form. A growing number of studies show a clear link between poor eating behaviors and higher BMI levels. In a similar vein, research by Hizli-Guldemir et al., (2023) showed that many overweight and obese office workers had irregular eating routines, often skipping meals, eating fast food, or not following consistent mealtimes. Zhao et al. (2023) added to this evidence through a long-term study, revealing that diets heavy in processed foods and low in fiber are associated with gradual BMI increases over time. These show that how often and regularly people eat matters, not just what they eat. This points to the importance of well-rounded nutrition programs that look beyond calories and nutrients and also address the behavioral side of eating, an approach that may be more effective for long-term weight management and preventing obesity.

While plenty of research has looked at how either physical activity or dietary habits affect Body Mass Index (BMI), there is still a noticeable gap when it comes to understanding how the two work together, especially in the context of student life. Most studies tend to examine just one side of the equation, focusing either on eating patterns (Grech et al., 2017) or the factors that influence how active people are (Viciana, 2019), without fully exploring how these behaviors interact and jointly shape BMI. This gap is particularly important among college students, who often deal with packed schedules, academic pressure, and long hours sitting, factors that can easily lead to unhealthy routines. Bastone et al. (2022) also pointed out that social and environmental challenges make it even harder for students to stay physically active. Yet, despite these realities, research that looks at both physical activity and diet together, specifically among university students, remains limited. With more young adults now experiencing issues related to being overweight or obese, there's a clear need for a more connected approach. By looking at both behaviors side by side, this study hopes to offer deeper, more relevant insights that can help shape practical, student-focused strategies for building healthier lifestyles.

This study departs from most existing research by examining the broader context of how physical activity and dietary habits interact to influence BMI among college students. While many studies focus on just one of these factors, this research recognizes that student health is often shaped by a mix of routines, pressures, and personal choices that can't be fully understood through numbers alone. That's why it will use a mixed-method approach, specifically an explanatory sequential design. It will start with surveys to gather measurable data on students' activity levels, eating patterns, and BMI. After analyzing those results, the next step will involve one-on-one conversations with selected participants to dig deeper into the "why" behind the numbers, what influences their daily habits, what barriers they face, and how their environment plays a role. By combining both statistical trends and the real-life stories behind them, this study hopes to offer a clearer, more relatable understanding of student health and to help shape solutions that can actually fit their needs and realities.

To make sure this study reaches the people who need it most, the results will be shared in ways that are accessible, meaningful, and relevant to both academic and everyday settings. On-campus discussions will be held to get students involved in open, relatable conversations about their health and lifestyle choices. Wellness talk and practical sessions will also be organized to help young adults understand how their daily habits, like eating and movement, impact their overall well-being. At the same time, the findings will be presented to educators, guidance counselors and health professionals who work closely with students, to give them tools they can use to better support healthy routines. Beyond the university setting, the research will be submitted to respective journals both locally and internationally; it can add to ongoing studies and conversations in the academic world. Since this study focuses on college students, who often deal with stress, irregular schedules, and limited time for self-care, the goal is to offer insights that reflect their reality and lead to simple, doable changes. By shedding light on how daily habits affect Body Mass Index (BMI), this work hopes to inform more adapted health programs, and its publication as a scholarly article will support both future research and real-life applications in student health promotion.

1.1. Worldview and Theoritical Lens

The researcher believes that understanding how college students' daily habits affect their Body Mass Index (BMI) is crucial, especially with obesity becoming more common in this age group. While some students face issues of being underweight, more are now struggling with excess weight due to long study hours, poor eating patterns, and limited opportunities for physical activity. These challenges often lead to unhealthy routines like skipping meals, eating fast food, or staying inactive for most of the day. By combining students' personal By examining experiences with measurable data, this study aims to uncover the deeper reasons behind the rising BMI levels. The goal is to offer practical, student-centered solutions that can help prevent obesity and support healthier lifestyles on campus.

As a pragmatist, the researcher is guided by a desire to generate knowledge that can be applied to real-world situations, especially those impacting student health and well-being within academic environments. This perspective embraces methodological flexibility, allowing the use of numerical data, personal insights, or mixed approaches, whichever best supports the research goals. Complementing this stance, the researcher also draws from a post-positivist view, which acknowledges that while objective reality exists, human understanding of it is always imperfect and shaped by context. From a post-positivist lens, findings are therefore seen as provisional and open to refinement through critical reflection, empirical testing, and triangulation. Together, these perspectives reinforce a commitment to producing knowledge that is both practically useful and rigorously examined. In the context of this study, this means generating insights that are grounded in lived student experiences, informed by evidence, and capable of guiding realistic and adaptable strategies for healthier student lifestyles. By remaining open to multiple ways of knowing while also recognizing the limits of certainty, this combined approach ensures that the research remains relevant, credible, and oriented toward meaningful change.

By focusing on actionable and context-sensitive findings, this perspective supports the creation of meaningful solutions for health concerns affecting sedentary lifestyles (Creswell & Creswell, 2018). Rather than sticking to one fixed method, pragmatism encourages the use of whatever approach best fits the situation. This kind of flexibility especially useful when dealing with complex health challenges like obesity or being underweight, issues that are shaped by more than just personal choices but also by routines, surroundings, and daily pressures. From this perspective, the goal of the study goes beyond just understanding the problem; it is about offering clear, practical steps that schools and institutions can take to support healthier habits among students.

Focusing on tertiary students, this perspective acknowledges that health behaviors, like physical activity and eating patterns, are shaped by real-life factors such as time management, personal motivation, access to healthy options, and peer influence. A pragmatist lens views these elements not as fixed challenges but as evolving factors that can directly affect Body Mass Index (BMI). Using an explanatory sequential mixed-methods design, the study begins with quantitative data to identify patterns and trends, followed by qualitative insights that explore students' lived experiences. This approach offers a well-rounded understanding of how these influences interact, supporting the development of meaningful health programs and campus policies that encourage long-term well-being among college students.

This study is anchored on Self-Determination Theory (SDT), a motivational framework developed by Ryan and Deci (2022). SDT focuses on the idea that human behavior is driven by the fulfillment of three basic psychological needs : autonomy (the sense of control over one's action), competence (the feeling of effectiveness and mastery), and relatedness (the sense of connection). with others). When these needs are satisfied, individuals typically experience increased intrinsic motivation, well-being, and personal development. A key aspect of SDT is the distinction between intrinsic motivation, which stems from genuine interest or enjoyment, and extrinsic motivation, which is shaped by external rewards or pressures. Deci and Ryan (1985) originally proposed that environments supporting autonomy and internal motivation lead to deeper engagement and more sustained behavioral outcomes, a position further expanded by Ryan and Deci (2020) in their later work.

This study centers on tertiary students from DACS-affiliated schools, recognizing the growing need to promote healthier habits among young adults. It explores how their physical activity and eating patterns relate to their Body Mass Index (BMI), using Self-Determination Theory (Deci & Ryan, 2017) to understand the role of motivation. When students feel capable, supported and in control of their choice, they're more likely to engage in consistent exercise and mindful eating (White et al., 2018). With the academic setting influencing daily routines and behaviors, a supportive school environment becomes key to encouraging long-term wellness (Standage & Ryan, 2020). This study closely looks at how the school environment and students' own motivation affect how much they eat and how much they move. The goal is to provide practical insights that can guide the development of more effective health and wellness programs within academic institutions, ultimately promoting healthier BMI levels among college students.

This study uses a quantitative approach to explore the influence of physical activity determinants and dietary habits as the independent variables, and Body Mass Index (BMI) as the dependent variable, as shown in Fig. 1. By integrating multiple theoretical perspectives, the study seeks to offer a thorough understanding of how these factors interact and influence one another. Four key theories guide the research, explaining the behavioral, psychological, and environmental influences on physical activity, dietary habits, and BMI.

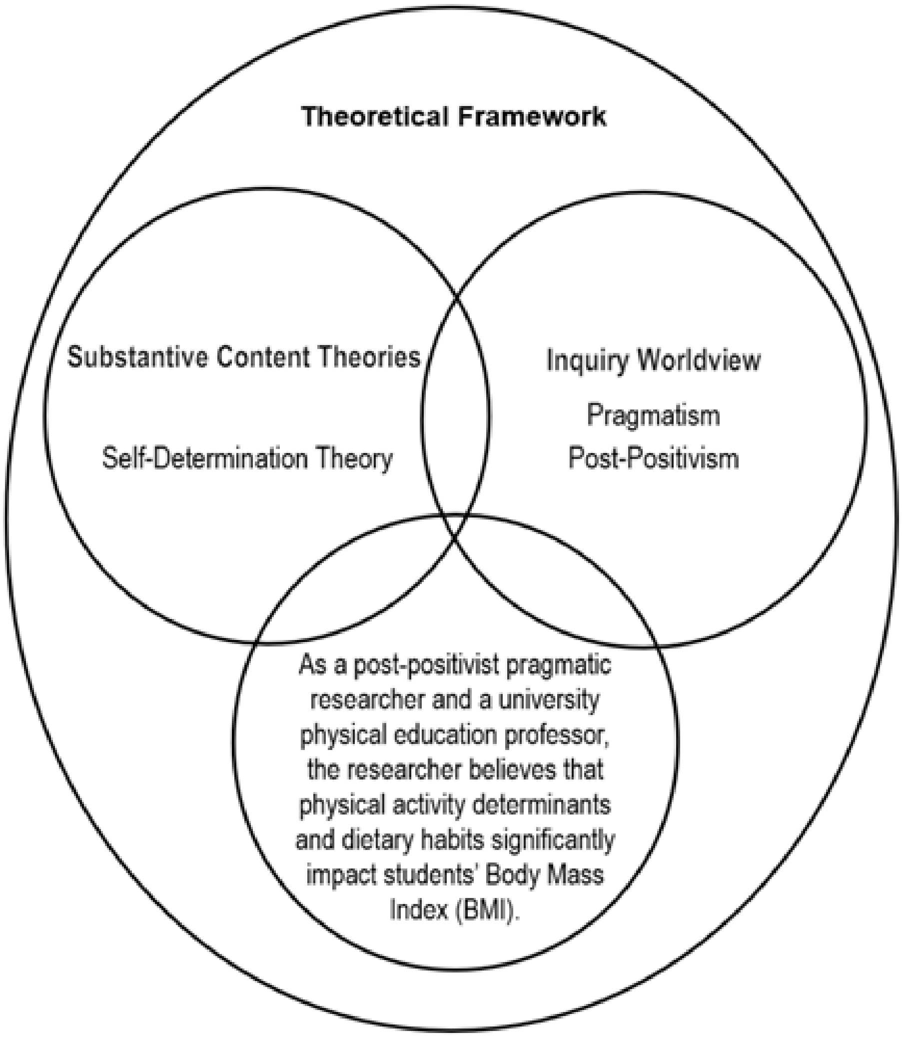
Recognizing the numerous individuals and groups that shape physical education in higher education is crucial for this study's execution. Each one offers a different viewpoint, and their input is vital to fully grasping the study's broader impact. This research seeks to connect these perspectives, from CHED, school administrators, the technical panel, the ethics committee, the research adviser, PE instructors, and students, to help physical education grow into a more meaningful and supportive part of the college experience.

Commission on Higher Education (CHED). CHED laid the groundwork for this study by establishing the academic and ethical standards that guided its development. Their dedication to quality research, student well-being, and a relevant curriculum played a key role in making sure the study stayed in line with the country's educational priorities.

School Administration. The involvement of the school administration was a vital part of this study. Their support made it possible to reach participants and access necessary resources, helping the research move forward without major setbacks. Their cooperation showed a genuine commitment to using research to enhance educational practices.

Technical Panel. The technical panel played an important role by offering thoughtful feedback and constructive critiques at every stage of the study. Their insights helped improve the research methods and tools, contributing to the clarity, reliability, and overall strength of the work.

Figure 1. ***Theoritical Framework***



Research Adviser. The research adviser was a steady source of guidance and support throughout the entire journey. Their insightful suggestions, academic expertise, and constant encouragement helped the researcher stay focused and navigate each phase of the study with greater clarity and confidence.

School Administrators. School administrators play a key role in shaping programs that affect students' BMI. Their leadership influences how PE classes and nutrition and wellness support are delivered. This study encourages them to rethink policies and make health programs more student-centered so students can improve their well-being, not just academic requirements.

Physical Education Teachers. Teachers play a vital role in this study, especially in shaping the factors that influence students' Body Mass Index (BMI). As they guide daily routines in physical education, they directly affect key determinants like students' physical activity habits and nutritional choices. Their strategy can help or hurt students' behavior, whether it is through fostering healthier lifestyles or active engagement. When teachers adjust their methods to better support physical activity and dietary habits, they contribute to positive outcomes in students' BMI, making the learning environment more responsive and health-focused.

PE Students. This study emphasizes the importance of students in comprehending how physical activity determinants and dietary habits shape Body Mass Index (BMI). Each student brings their reasons for being active, whether it is to stay healthy, bond with others, or simply feel better. Their food choices and exercise routines reflect habits that directly influence BMI. By sharing what encourages or limits their engagement in physical activity and healthy eating, students help uncover how these independent variables impact BMI, offering insights that can guide more effective and student-centered approaches to health.

1.2. Purpose Statement

This study addressed the influence of physical activity determinants and dietary habits on the Body Mass Index (BMI) of the students. An explanatory mixed methods design was used, which involved collecting qualitative data after a quantitative phase to explain or follow up on the quantitative findings in greater depth. In the first quantitative phase of the study, survey instrument data were collected from tertiary students enrolled in PE courses at the affiliated schools of the Davao Association of Catholic Schools (DACS) to test the theory that behavioral and environmental factors, such as motivation, time constraints, access to workout spaces, and eating habits, helped explain why physical activity determinants and dietary habits were related to BMI. The second qualitative phase was conducted to deepen the understanding of the statistical findings by exploring student experiences more closely. In this explanatory follow-up, students' lived health behaviors and personal perspectives were examined among tertiary students enrolled in PE courses at schools affiliated with DACS. The purpose of this explanatory follow-up was to help explain or build upon the initial quantitative results, providing a more complete and context-rich understanding of the challenges students faced in maintaining a healthy lifestyle.

1.3. Research Questions

This study determined the influence of physical activity determinants and dietary habits on the BMI of the tertiary PE students in DACS-affiliated schools. Specifically, it seeks answers to the following questions:

1. What is the status of physical activity determinants, dietary habits, and the Body Mass Index (BMI) of the DACS-affiliated schools' students?
2. Do the physical activity determinants significantly influence the students' BMI in DACS-affiliated schools?
3. Do the dietary habits significantly influence the students' BMI in DACS-affiliated schools?

1.4. Review of Related Literature

This section explored various related literature and studies that directly contributed to the framework of the research. The sources utilized included a diverse range of materials, such as academic journals, shared resources, online references, and other relevant research publications. Incorporating these sources was essential, as they established a strong foundation for the study and provided valuable insights and perspectives aligned with its objectives and focus. These insights not only enhanced the depth and credibility of the research but also contributed to a broader understanding of the topic.

1.4.1. Physical Activity Determinants

Physical activity determinants refer to the various factors, individual, social, environmental, or policy-related, that shape or influence a person's likelihood of engaging in physical activity. These determinants encompass a wide range of elements, including personal characteristics such as motivation or age, interpersonal influences such as social support, and broader community or environmental conditions like walkability or access to facilities. A recent consensus project by Dygrýn et al. (2025) describes physical activity determinants as the key conditions or attributes that affect physical activity behavior across contexts and populations. Similarly, an umbrella review by D'Amore et al. (2023) emphasizes that determinants operate at multiple levels, individual, social, and environmental—and help explain variations in physical activity participation among community-dwelling adults. Further, the World Health Organization (2020) notes that physical activity participation is shaped by a combination of behavioral, environmental, and systemic factors, recognizing these determinants as essential for developing effective public health strategies and activity guidelines.

Recent literature describes levels of physical activity determinants across socioeconomic, psychological, and environmental domains. O'Donoghue et al. (2018) outline varying levels of socioeconomic determinants, noting that physical activity is shaped differently at lower, middle, and higher socioeconomic positions as documented across the studies included in their umbrella review. In the psychological domain, Rhodes et al. (2016) identify measurable levels of physical-activity identity, distinguishing individuals who hold a strong, moderate, or low sense of identifying with being physically active, as categorized across intervention and observational studies in their review. Complementing these perspectives, Wendel-Vos et al. (2007) describe levels of environmental determinants, including gradations in access to supportive features such as recreational facilities, walkable streets, and connected neighborhoods, as documented in their synthesis of built-environment characteristics. Together, these sources detail how physical activity determinants appear across identifiable levels within socioeconomic, identity-based, and environmental categories, providing structured classifications without addressing directional effects.

Recent studies describe physical activity levels across populations as varying according to identifiable determinants. Van Dyke et al. (2023) report differing levels of leisure-time physical inactivity among U.S. adults during the early pandemic period, with sociodemographic groups showing distinct inactivity patterns. Reviews of built-environment assessments by Westenhöfer et al. (2023) summarize documented levels of physical activity associated with walkability features such as street connectivity and access to destinations, as consistently noted within health-impact assessment findings. In addition, Rhodes et al. (2024) identify measurable levels of physical-activity identity within intervention research, indicating the gradations at which identity-related determinants appear across adult samples. Collectively, these sources provide descriptions of physical activity levels as they appear across socioeconomic, environmental, and psychological determinants without asserting directional effects.

Knowledge. In this study, knowledge refers to an individual's understanding of physical activity guidelines, benefits, and requirements, which serves as a measurable factor within the broader set of determinants influencing activity behavior. The DE-PASS expert consensus by Dygrýn et al. (2025) identifies knowledge as one of the core definable determinants of physical activity. Likewise, D'Amore et al. (2023) describe knowledge as an intrapersonal factor commonly assessed when examining variations in physical activity across populations. Research by Bako et al. (2025) further demonstrates that knowledge can be quantified through awareness of physical activity recommendations, reinforcing its role as a key indicator within determinant frameworks .

Knowledge related to physical activity determinants refers to the information individuals possess about physical activity, including concepts such as health guidelines, basic fitness principles, and general awareness of movement-related practices. Recent work, such as that described by Buchmann et al. (2023), outlines knowledge as a component of the informational domain that contributes to understanding physical activity within public health contexts. Similarly, Condello et al. (2017) discuss knowledge as part of broader educational and informational frameworks frequently included when categorizing determinants of physical activity in research settings. In addition, Stonerock and Blumenthal (2016) identify knowledge as one of the commonly referenced elements when describing informational approaches used in physical activity–related programs. Together, these sources present knowledge as a standardized, descriptive component within physical activity determinant frameworks, emphasizing its role as an informational element used in classifying how individuals understand physical activity concepts.

Environmental Context and Resources. Environment context and resources as an indicator of physical activity determinants refers to the physical, structural, and material conditions within an individual's surroundings that shape the opportunities available for engaging in physical activity. This includes the presence and quality of facilities such as parks, open spaces, sidewalks, and recreational areas, as well as broader environmental characteristics like neighborhood layout, accessibility, and safety. The DE-PASS expert consensus by Dygrýn et al. (2025) identifies environmental context and resources as a defined determinant category, emphasizing its role in describing the physical settings in which activity can occur. Similarly, Hu et al. (2021) describe environmental features, such as facility accessibility and neighborhood safety, as part of the community-level determinants used to classify conditions that support or constrain movement opportunities in children and adolescents. Additionally, recent work by Oba et al. (2024) includes environmental characteristics, such as awareness of urban activity facilities, as structural variables commonly incorporated into determinant frameworks to represent the physical surroundings relevant to physical activity participation.

Environmental factors significantly influence physical activity behaviors, with the built environment playing a pivotal role in either facilitating or hindering active lifestyles (Althoff et al., 2024). Research indicates that access to recreational spaces, such as parks and walking trails, is positively associated with increased physical activity levels among individuals (Shu et al., 2022).

Conversely, environments lacking such amenities often correlate with sedentary behaviors and higher incidences of lifestyle-related health issues. Moreover, the quality and safety of these spaces are crucial; well-maintained and secure areas encourage regular use, whereas neglected or unsafe environments deter physical activity participation (Yeager et al., 2018). Additionally, urban planning that promotes walkability, through the presence of sidewalks, pedestrian crossings, and reduced traffic congestion, has been linked to higher rates of physical activity within communities (Althoff et al., 2024).

Physical activity is influenced by a variety of environmental, psychological, social, and economic factors. The built environment plays a crucial role in promoting active lifestyles, as evidenced by studies highlighting the importance of accessible recreational spaces, urban design, and transportation infrastructure (Carlin et al., 2017). Similarly, the home environment has been identified as a determinant of physical activity levels, with research indicating that the presence of exercise equipment and available space encourages individuals to be more active (Kaushal & Rhodes, 2018). Socioeconomic factors also contribute to the disparities in physical activity engagement, as individuals from lower-income backgrounds often face barriers such as limited access to safe exercise areas and recreational programs (Izzicupo et al., 2019). Psychosocial influences, including self-efficacy and perceived competence, significantly affect physical activity participation, particularly among older adults who benefited from strong social support and confidence in their abilities (Kosteli et al., 2016).

Motivation and Goals. As an indicator of physical activity determinants refer to the internal drives, intentions, and purpose-setting processes that help describe how individuals direct effort toward physical activity. The DE-PASS consensus by Dygrýn et al. (2025) identifies motivation and goals as core psychological elements within determinant classifications. Stevens et al. (2020) describe motivation, including intrinsic motives and affective states, as a fundamental component used to characterize internal orientations toward activity. Rhodes, Cox, and Sayar (2021) also highlight intention- and goal-related constructs as standard elements within determinant frameworks used to categorize goal-setting and motivational processes in physical activity research.

Motivation and goal-setting are critical determinants of physical activity engagement, influencing both initiation and adherence to exercise routines. With regard to motivation and behavioral engagement, self-determination theory emphasizes that autonomous motivation, participating in physical activity due to intrinsic interest or personal satisfaction, promotes more sustained involvement than controlled motivation, which results from external pressures or obligations (Teixeira et al., 2012). Individuals who are driven by autonomous motivation are more likely to maintain regular physical activity because their behaviors are aligned with their personal values and genuine interests (Palmer et al., 2020). Swann et al., 2021, have shown that the implementation of specific, challenging, yet attainable goals enhances motivation and performance in physical activity contexts. Goal-setting theory suggests that setting personal records tailored to one's abilities provides a balanced challenge, fostering consistent effort and personal growth. Moreover, understanding the underlying motives for exercise, such as health benefits, stress control, or social interaction, can inform the development of targeted interventions to boost motivation and promote long-term adherence to physical activity (Rodrigues et al., 2020). Interventions aimed at promoting physical activity tend to be more successful when they address the underlying factors that drive behavioral change. Effectively designing these interventions requires a precise understanding of the specific theoretical elements influencing physical activity participation (Taylor et al., 2013).

Beliefs About Capabilities. As an indicator of physical activity determinants refer to an individual's perceived confidence, self-beliefs, and sense of competence related to performing physical activity. The DE-PASS consensus by Dygrýn et al. (2025) includes these cognitive and confidence-based constructs within standardized determinant categories. Cortis et al. (2017) identify self-efficacy-belief in one's capabilities, as a key psychological factor commonly used in physical activity determinant frameworks. Medrano-Ureña et al. (2020) similarly describe exercise self-efficacy as a central capability-based element used to classify an individual's perceived physical competence in research settings.

Beliefs about personal capabilities, commonly referred to as self-efficacy, are critical determinants of physical activity engagement. Self-efficacy reflects an individual's confidence in their ability to successfully perform specific behaviors, such as maintaining a regular exercise regimen (McAuley & Blissmer, 2000). High self-efficacy has been consistently linked to increased physical activity levels, as individuals who believe in their capabilities are more likely to initiate and sustain exercise routines (Williams & Rhodes, 2016). Conversely, low self-efficacy can act as a barrier, deterring individuals from engaging in physical activity due to perceived challenges or anticipated failures (Warner et al., 2016). Interventions aiming to enhance self-efficacy through strategies like mastery experiences, social modelling, and verbal persuasion have demonstrated effectiveness in promoting sustained physical activity behaviors. These findings underscore the importance of addressing self-efficacy beliefs in the design of public health initiatives and individual interventions to foster active lifestyles.

Skills. As an indicator of physical activity determinants refer to the fundamental movement abilities, motor competencies, and practical physical competencies that enable individuals to perform physical activities effectively. These skills include basic locomotor, object-control, and stability movements, which form the foundation for more complex physical tasks. The DE-PASS consensus by Dygrýn et al. (2025) identifies physical skills as part of the standardized determinant categories used to describe individual capacity within physical activity frameworks. Similarly, Piotrowski et al. (2025) emphasize that fundamental movement skills are essential components of physical literacy and act as core competencies that support participation in physical activity across the lifespan. In addition, Redublado et al. (2024) highlight movement skills proficiency as a commonly assessed indicator in school-based physical activity interventions, noting its role in describing physical competence and readiness for activity engagement.

Proficiency in motor skills is a significant determinant of physical activity engagement across various age groups. Research shows that individuals with better motor skills are more likely to engage in regular physical activity, as these skills enhance confidence and reduce perceived barriers to exercise (Robinson et al., 2015). Conversely, limited motor skill proficiency can lead to decreased activity levels, potentially due to feelings of inadequacy or fear of injury (Barnett et al., 2016). Moreover, interventions focusing on improving motor skills have demonstrated effectiveness in increasing physical activity participation, highlighting the importance of skill development in promoting active lifestyles (Logan et al., 2015).

Emotion. As an indicator of physical activity determinants refer to the affective states and feelings, such as enjoyment, discomfort, or general mood that describe how individuals experience physical activity. Stevens et al. (2020) classify emotional responses and affective processes as core affective constructs within physical activity determinant frameworks. The DE-PASS consensus by Dygrýn et al. (2025) also includes affective or emotional components within standardized psychological determinant categories. In addition, Williams and Evans (2014) identify emotional experience as an essential domain for understanding how people interpret and process physical activity within health behavior science.

Emotions are key to determining physical activity behaviors, as they influence motivation, engagement, and long-term adherence to exercise. Positive emotions such as enjoyment and satisfaction have been linked to sustained participation in physical activities, reinforcing intrinsic motivation and promoting healthier lifestyles (Drew et al., 2019). Conversely, negative emotions, including anxiety and fear, can serve as significant barriers to physical activity, particularly when individuals associate exercise with discomfort or past failures (Rhodes & Kates, 2015). Research suggests that interventions aimed at enhancing positive emotional experiences during physical activity, such as incorporating enjoyable elements and fostering a supportive environment, can effectively improve adherence rates (Williams & Evans, 2014).

Social Influences. As an indicator of physical activity determinants refer to the social conditions, interpersonal interactions, and forms of support present within an individual's social environment. These include the presence of family, peers, teachers, or community members who contribute to the social context in which physical activity occurs. Hu et al. (2021) identify social support as one of the commonly referenced contextual elements within social ecological classifications for physical activity in youth. D'Amore et al. (2023) describe social support as part of the social-level categories used in organizing physical activity determinants within umbrella review frameworks. Oba et al. (2024) also include social support as an interpersonal factor represented within large-scale determinant models of physical activity.

Social influences play a critical role in shaping physical activity behaviors, as interactions with peers, family, and the broader community can significantly impact an individual's motivation and participation levels. According to Lubans et al. (2016), social support from friends and family serves as a key determinant of sustained physical activity, as encouragement and shared participation foster accountability and enjoyment. Sutherland (2021) also points out that peer norms have a big effect on teens and young adults. For example, when friends and family encourage them to be active, they are more likely to do so. Furthermore, a study by Chen et al. (2016) emphasizes that structured social environments, such as school-based physical education programs and community fitness initiatives, create opportunities for individuals to establish long-term exercise habits. The strategic use of social media has shown effectiveness in shaping physical activity behaviors. By leveraging targeted information dissemination and interactive engagement strategies, social media platforms can foster motivation and participation in physical activities. These approaches offer valuable insights for designing socially driven public health initiatives and enhancing digital health promotion efforts (Hera et al., 2024).

Beliefs About Consequences. As an indicator of physical activity determinants refer to the expectations individuals hold regarding the possible outcomes of engaging in physical activity. These beliefs may include anticipated physical, psychological, social, or self-evaluative outcomes and are used in determinant frameworks to describe the cognitive expectations individuals associate with activity-related behaviors. Bohlen et al. (2022) describe these beliefs often termed outcome expectancies, as cognitive assessments of the likely results of performing physical activity, including perceived benefits or consequences. The DE-PASS consensus by Dygrýn et al. (2025) includes beliefs about anticipated outcomes as part of the standardized psychological determinant categories in physical activity research. Similarly, Fasbender (2020) defines outcome expectancies as beliefs about the consequences of one's behavior, encompassing anticipated physical, affective, and social outcomes relevant to physical activity contexts.

Beliefs about the consequences of physical activity significantly influence an individual's motivation and engagement in exercise-related behaviors. Research indicates that individuals who perceive positive health outcomes, such as improved cardiovascular fitness and weight management, are more likely to engage in regular physical activity (Choi et al., 2017). Moreover, fear of negative consequences, such as injury or exhaustion, can serve as a barrier to participation, particularly among individuals with lower self-efficacy in physical fitness (Hagger et al., 2022). In addition, a study by Rhodes et al. (2021) highlights that individuals who associate physical activity with long-term benefits, including reduced risks of chronic disease and enhanced mental well-being, are more inclined to maintain a consistent exercise routine. These findings suggest that promoting awareness of both immediate and long-term health benefits, while addressing misconceptions about risks, can enhance participation in physical activities across diverse populations.

Action Planning. As an indicator of physical activity determinants refers to the process of specifying when, where, and how a person intends to carry out a physical activity behavior. It is used in determinant frameworks to describe the structured, preparatory steps individuals outline to organize and translate intentions into concrete actions. Pfeffer and Strobach (2020) describe action planning as a self-regulatory component that involves generating detailed plans for performing physical activity behaviors. Peng et al. (2022) characterize action planning as a planning-based strategy used in interventions to help individuals articulate the specific steps required for task completion, often distinguished from coping planning. In a broader determinant context, Lin et al. (2021) identify action planning as a brief behavior-change technique within the Health Action Process Approach, used to classify planning-related cognitive components that support the structuring of intended physical activity actions.

Action planning plays a crucial role in translating intentions into consistent physical activity by outlining specific strategies for when, where, and how exercise will be performed. Research indicates that individuals who participate in comprehensive action planning are more inclined to comply with their physical activity objectives, as organized plans facilitate the connection between motivation and behavior (Carraro & Gaudreau, 2013). Additionally, studies indicate that integrating action planning with coping strategies enhances commitment by preparing individuals for potential barriers, such as time constraints or lack of motivation (Scholz et al., 2017). Furthermore, Wiedeman et al. (2019) found that self-regulatory techniques, including goal setting and progress monitoring, significantly improved adherence to exercise programs, particularly when individuals perceive autonomy in their planning. Research indicates that tailored interventions are effective in promoting physical activity, with action planning being particularly beneficial. Future initiatives should concentrate on refining these personalized strategies to enhance their effectiveness in encouraging greater engagement in physical activity (Ma et al., 2021).

Coping Planning. As an indicator of physical activity determinants refers to the preparatory process of identifying potential barriers to being active and outlining strategies to manage or overcome these barriers. Within behavioral frameworks, coping planning is classified as a volitional determinant that helps describe how individuals organize strategies for maintaining intended physical activity under challenging conditions. Schwarzer and Hamilton (2020) identify coping planning as a volitional component in the Health Action Process Approach, used to categorize how individuals prepare for obstacles during behavioral performance. Wee and Dillon (2022) distinguish coping planning from action planning by describing it as the process of anticipating challenges and specifying coping responses within physical activity contexts. Additionally, Silva-Smith et al. (2024) note that coping planning is one of the operationalized constructs frequently included when organizing determinant categories in HAPA-based physical activity interventions.

Coping planning is a crucial factor in maintaining activity by preparing individuals to overcome potential barriers and setbacks. Studies indicate that individuals who incorporate coping strategies into their planning are more likely to maintain consistent exercise routines over time, as it helps them anticipate challenges and develop strategies to stay active despite obstacles (Schwarzer et al., 2020). Additionally, Carraro et al. (2018) found that coping planning enhances adherence to physical activity by fostering self-regulatory skills, allowing individuals to modify their exercise routines when faced with time constraints, fatigue, or lack of motivation. Furthermore, Scholz et al. (2020) emphasized that integrating coping planning with goal-setting interventions significantly improves physical activity maintenance, particularly in individuals with low initial motivation.

Goal Conflict. As an indicator of physical activity determinants refers to situations in which a person's various goals compete for time, attention, or effort, creating competing demands that structure how physical activity fits within their overall set of priorities. Bray and Harris (2025) describe goal conflict as the presence of other goals that make pursuing activity less compatible within daily routines. Rhodes, Cox, and Sayar (2021) list goal conflict as a reflective motivational construct used to classify competing priorities in determinant frameworks. Bailis (2021) similarly identifies goal conflict as a contextual factor representing how multiple goals may compete when organizing regular activity behaviors.

Goal conflict is a significant factor influencing physical activity engagement, as individuals often struggle to balance exercise with competing personal, academic, or work-related goals. Research by Rhodes et al. (2017) highlights that goal conflict can lead to lower adherence to physical activity routines due to time constraints and competing priorities. Similarly, Hennessy et al. (2020) found that individuals who perceive a high degree of goal conflict are less likely to engage in regular physical activity, as their cognitive resources are divided among multiple commitments, reducing their ability to prioritize exercise. Moreover, Gerber et al. (2025) emphasized that effective self-regulation strategies, such as goal alignment and time management, can help mitigate the negative impact of goal conflict on physical activity participation. Structured planning can help people deal with conflicting goals by helping them set realistic routines and organize their priorities. This can help them balance school, work, and social life. This approach supports consistent physical activity by reducing stress, enhancing time management, and reinforcing healthy habits even during busy schedules.

1.4.2. Dietary Habits

The long-term patterns, routines, and behaviors related to food selection, preparation, and consumption that individuals maintain in daily life. These habits encompass the types of foods regularly eaten, the frequency and timing of meals, and the broader dietary patterns formed over time. Li et al. (2023) define dietary habits as enduring eating patterns shaped by ongoing food-related behaviors and choices. In nutritional guidance contexts, the World Health Organization

(2026) describes dietary habits through foundational principles such as adequacy, balance, moderation, and diversity within daily eating practices. Similarly, English et al. (2024) describe dietary habits as habitual combinations of foods and beverages that form an individual's overall dietary pattern, which is assessed in diet-related research and public health guidelines.

Dietary habits play a crucial role in shaping BMI and overall weight status, influencing metabolic efficiency, nutritional balance, and long-term health outcomes. Evidence from Zhou et al. (2022) indicates that higher fruit and vegetable consumption is linked not only to improved cognitive outcomes but also to healthier weight patterns, as diets rich in plant-based foods tend to support better weight management through lower caloric density and higher fiber content. Likewise, adherence to the MIND diet which integrates Mediterranean and DASH dietary principles is associated with maintaining healthier body weight due to its emphasis on whole grains, leafy greens, nuts, and reduced intake of saturated fats (George & Reddy, 2019). Supporting this, research presented at the American Society for Nutrition's annual conference highlights that establishing nutritious dietary habits early in life contributes to healthier metabolic profiles and more stable weight trajectories into adulthood (Greger, 2023).

Recent work describes distinct levels of dietary habits across different eating patterns. Findings from Temba et al. (2025) show that Tanzanian participants who adopted a Western-style diet, characterized by high levels of processed foods, exhibited rapid shifts in dietary intake composition over just two weeks, in contrast to those maintaining traditional African diets, which contain high levels of vegetables, fiber, and fermented foods. In comparison, Martínez-González et al. (2019) outline the key components of the Mediterranean diet, noting its high levels of minimally processed plant-based foods and healthy fats, which form the basis of this dietary pattern's nutritional profile. Complementing these classifications, Latruffe and Lizard (2024) describe traditional African diets as containing elevated levels of vegetables, legumes, ancient grains, and fermented foods, distinguishing them from Westernized dietary patterns and emphasizing their composition as plant-rich eating frameworks.

Dietary habits play a central role in shaping BMI, with Jalloun and El Shikiere (2021) reporting that university students who engaged in less healthy eating patterns tended to present with higher BMI scores, reflecting how everyday food choices contribute directly to weight status. Likewise, Bahr Bugge et al. (2022) observed that individuals following plant-based dietary patterns often reported better overall health, a finding aligned with literature linking nutrient-dense diets to more favorable BMI outcomes. Broader lifestyle analyses by Latruffe and Lizard (2024) also identified dietary practices as one of several modifiable behaviors influencing long-term health trajectories, underscoring the importance of balanced eating in maintaining healthier BMI levels.

Time and School Management. Refers to the way a school day is organized, including the length and timing of meal periods, true seated "time to eat," queuing and service logistics, and placement of breakfast within the schedule that collectively shape when and how students obtain and consume food during the school day. Public-health guidance highlights at least 20 minutes of seated lunch time as a practical scheduling parameter used to structure eating routines and reduce rushed meals (Centers for Disease Control and Prevention, 2024), with companion CDC materials detailing operational strategies such as minimizing lines, pre-ordering, and scheduling practices) to ensure that seated time is actually delivered (Centers for Disease Control and Prevention, n.d.). Education agencies similarly frame "adequate time to eat" in policy and implementation guidance commonly recommending 10 minutes for breakfast and 20 minutes for lunch once seated to support meal access and routine eating across the school day (California Department of Education, 2025). Research in school settings operationalizes these time elements (e.g., 10- vs. 20-minute seated lunch conditions) to document differences in what children consume and discard, underscoring lunch-period duration and service flow as routinely measured schedule features when describing student eating patterns (Burg, Metcalfe, Ellison, et al., 2021).

Studies on time and school management in relation to dietary habits describe varying levels of time-related behaviors among learners, emphasizing how individuals organize their schedules, allocate time for daily activities, and structure routines that include food-related tasks. Indreica (2019) reported levels of time management among participants characterized by organized planning, task scheduling, and prioritization, alongside measured levels of healthy eating practices reflecting meal preparation, food choice awareness, and balanced intake patterns. Similarly, Almoraie et al. (2024) described levels of eating behaviors among university students, noting the extent to which academic demands, food environments, and personal routines shape consistent or inconsistent eating patterns, with observable levels of structured versus unstructured dietary habits across student groups. In school settings, Briones et al. (2019) documented levels of time management among Grade 12 learners, outlining how students distribute time across academic tasks and daily responsibilities, providing insight into their degree of time organization within the school context.

Knowledge and Self-control. As an indicator of dietary habits, can be defined as the level of nutrition knowledge—including awareness of dietary guidelines, food composition, label interpretation, and healthy meal planning—paired with the level of self-regulatory capacity to monitor, restrain, and sustain eating behaviors in line with health goals; operationally, this encompasses measurable gains in students' dietary knowledge following structured nutrition education (Owolabi, 2019) , documented self-control dispositions among adolescents that characterize how consistently they maintain disciplined eating patterns (Fitzpatrick, 2019), and demonstrated self-regulation skills (e.g., goal setting, self-monitoring, and deliberate choice) strengthened by food-literacy interventions that build both knowledge and behavioral control in school settings (Mancone et al., 2024).

Studies describe varying levels of nutrition knowledge and self-control among adolescents and students, with Owolabi (2019) reporting that learners commonly begin with low to moderate levels of dietary knowledge measured through structured nutrition knowledge assessments. Fitzpatrick (2019) similarly identified low, moderate, and high levels of self-control among adolescents based on self-report scales assessing behavioral restraint in eating contexts. Complementing these findings, Mancone et al. (2024) observed moderate baseline levels of food literacy and self-regulation in adolescents, which were distinguishable through their ability to understand nutrition information and manage eating behaviors.

Recent studies describe varying levels of nutrition knowledge and self-regulation among adolescents, with Koca and Arkan (2020) reporting distinct score ranges on the Adolescent Nutrition Literacy Scale that grouped adolescents into low-, mid-, and high-literacy levels based on their ability to understand and apply nutrition information. Naigaga et al. (2021) found varied levels of critical nutrition literacy, noting that adolescents demonstrated differing capacities to critically evaluate nutrition information and engage in health-supportive behaviors, indicating low to moderate levels across a large sample. Brown et al. (2021) also identified graded levels of food and nutrition knowledge among adolescents aged 13–19, showing clear distinctions in knowledge proficiency linked to familiarity with food labels and basic nutrition concepts.

1.4.3. Body Mass Index (BMI)

Body Mass Index (BMI) is a numerical value used to classify weight status by comparing an individual's body weight to their height. It is calculated by dividing weight in kilograms by the square of height in meters. BMI provides a standardized method for categorizing individuals into general weight-related groupings such as underweight, healthy weight, overweight, and obesity. The CDC (2025) defines BMI as a quick and widely used screening measure based on weight-for-height to classify weight categories. Britannica (2026) describes BMI as an indirect estimate of body fatness derived from the ratio of weight to squared height and used to determine weight status groups. The World Health Organization (2025) identifies BMI as a surrogate marker for body fatness and applies it worldwide to standardize definitions of overweight and obesity in adults and children.

Regular lifestyle behaviors strongly shape BMI, with Jakicic et al. (2019) noting that adults who consistently engage in moderate-to-vigorous physical activity are less likely to experience weight gain over time. The WHO 2020 guidelines likewise emphasize that 150–300 minutes of aerobic activity per week supports healthier weight outcomes across age groups. In terms of diet, the USDA Nutrition Evidence Systematic Review (2020) reports that dietary patterns high in fruits, vegetables, whole grains, and low in added sugars are associated with lower BMI and reduced obesity risk. Supporting this, Guyenet (2019) found that increasing whole-fruit intake aids weight control due to its low energy density and high fiber content, while Jakobsen et al. (2022) observed that reducing sugar-sweetened beverage intake improves body-fat–related measures in youth.

BMI patterns are strongly shaped by lifestyle factors, with Jakicic et al. (2019) showing that adults who engage in regular moderate-to-vigorous physical activity are more successful at preventing weight gain and maintaining healthier BMI levels. The WHO's 2020 guidelines similarly emphasize that achieving 150–300 minutes of weekly aerobic activity supports healthier body weight across populations. Dietary habits also play a central role, as the USDA Nutrition Evidence Review (2020) reports that diets rich in fruits, vegetables, whole grains, and low in added sugars are associated with lower BMI and reduced obesity risk. Consistent with this, Guyenet (2019) found that higher intake of whole fruits contributes to better weight control, while Jakobsen et al. (2022) observed that reducing sugar-sweetened beverages improves body-fat–related measures in youth, underscoring how food choices directly influence BMI status.

BMI is widely used to classify individuals into categories such as underweight, normal weight, overweight, and obesity. O'Neal et al. (2021) referenced BMI categories when examining weight-status classifications among African American women, emphasizing the distinction between overweight and obese groups. Freedman et al. (2017) likewise discussed the use of BMI cutoffs for categorizing children into weight-status groups, noting that these classifications serve as a standard approach for identifying individuals within higher BMI ranges. Together, these studies reflect the common use of BMI categories in documenting and organizing weight status in different populations.

BMI among adolescents is closely shaped by lifestyle factors, and Bell et al. (2021) note that students with higher BMI categories often demonstrate behavioral patterns that reflect poorer lifestyle balance, including inadequate physical activity and irregular eating practices, which contribute to unhealthy weight trajectories. Nam et al. (2021) further describe how rising obesity rates among Korean children highlight concerns regarding daily habits, emphasizing that limited physical activity and exposure to calorie-dense diets are becoming central issues in weight-related experiences. In a similar vein, Martin et al. (2022) explain that discussions surrounding weight and appearance frequently occur alongside dietary behaviors in childhood, suggesting that food choices and activity levels form part of the broader context in which BMI develops. Addressing these lifestyle determinants, Traub (2022) underscores the importance of strengthening supportive strategies within schools, families, and communities to promote healthier dietary habits and more active routines, which are essential for helping children maintain more balanced BMI levels.

BMI is commonly understood through lifestyle patterns shaped by physical activity and dietary habits, with Emon et al. (2024) noting that individuals in higher BMI categories often exhibit daily routines that include limited movement and less balanced eating behaviors, which contribute to variations in overall well-being . Alongside these behavioral determinants, recent technological advances have introduced new ways to assess BMI, as Aarotale et al. demonstrated that deep-learning models can estimate BMI from facial features with notable accuracy, while Yousaf et al. (2021) similarly developed an AI-based system using region-aware pooling to generate reliable BMI estimates. These innovations highlight the growing potential of AI to complement traditional lifestyle-based BMI understanding by offering noninvasive, efficient tools that support more accessible monitoring and management of weight-related health indicators.

Underweight. Being underweight indicates that an individual's weight falls below the recommended healthy range, which is necessary for the body to function optimally. Deviating from this range may lead to compromised immune function, fertility issues, mental health concerns, and other health complications (Van Steijvoort et al., 2024). Underweight individuals (with a BMI of less than 18.5 kg/m^2) face increased health risks, including cardiovascular diseases (CVD), weakened immunity, and higher mortality rates. a study by Uzogara (2016) found that underweight adults had a 1.34 times higher risk of CVD, with the risk increasing to 1.9 times for those under 60 years old.

Underweight status in older adults is associated with higher mortality, despite the potential health benefits of extra body mass (Masters, 2023). To address these risks, safe weight gain strategies such as nutrient-rich diets, protein intake, and strength training are recommended (Norman et al., 2021). Medical supervision is also crucial to prevent complications like refeeding syndrome. Addressing underweight BMI requires targeted healthcare interventions to reduce long-term health complications.

Recent global reports show measurable levels of underweight across age groups, with the NCD Risk Factor Collaboration (2024) noting that several countries still record notable levels of underweight and thinness among school-aged children and adolescents, particularly in regions such as South Asia and sub-Saharan Africa. UNICEF (2025) further reports that underweight among ages 5–19 stands at 9.2% globally, reflecting a persistent though declining level of undernutrition in youth populations. Complementing these estimates, the WHO Joint Child Malnutrition Estimates (2024) classify millions of children under five as underweight, demonstrating substantial but regionally variable levels of underweight prevalence worldwide.

Across recent global assessments, varying levels of thinness and underweight continue to appear among children and adolescents. Data from the WHO's 2024 indicator on adolescent thinness show that measurable proportions of youth fall below −2 standard deviations on BMI-for-age, indicating persistent levels of underweight in multiple regions despite long-term improvements. The Lancet's commentary in 2024 also highlights that updated surveillance reveals age-standardized underweight levels remain a component of the global double burden of malnutrition, with several countries still showing notable percentages of children and adolescents classified in the underweight or thinness category. Complementing these findings, UNICEF's 2025 database on school-aged children notes that although thinness among ages 5–19 has gradually declined, recent levels continue to be recorded across regions, especially in areas undergoing rapid dietary transitions.

Normal Weight. Normal weight in the context of Body Mass Index (BMI) is commonly described in recent literature as a classification reflecting a BMI range of 18.5 to 24.9 kg/m^2 for adults, a standard widely used in population health monitoring and nutritional assessment; the World Health Organization identifies this range as indicative of adequate weight relative to height and appropriate for evaluating adult nutritional status. Similarly, the Centers for Disease Control and Prevention (CDC) defines "healthy weight" for adults as BMI values falling between 18.5 and <25, emphasizing its role as a practical screening tool for assessing whether an individual's weight aligns with established health benchmarks. Complementing these definitions, the American Heart Association (AHA) also recognizes BMI values within 18.5–25 kg/m^2 as normal weight, noting that individuals in this category tend to have lower risks of chronic conditions associated with excess body fat, reinforcing BMI as a broadly accepted indicator of healthy body composition.

A normal weight refers to having a Body Mass Index (BMI) within a range that does not elevate the risk of weight-related illnesses and health complications (Haden, 2019). Maintaining a Body Mass Index (BMI) within the normal weight range is associated with optimal health outcomes. The relationship between BMI and health-related quality of life (HRQoL) exhibits an inverse U-shape, with HRQoL peaking at a BMI of 22 kg/m^{22} in women and between 22 and 30 kg/m^{22} in men (K. Maximova et al., 2008). Notably, men aged 50 and above with a BMI of 29 kg/m^2 reported higher HRQoL scores compared to those with a BMI of 20 kg/m^2. Additionally, a comprehensive study across 195 countries over 25 years found that excess body weight accounted for approximately 4 million deaths in 2015, with nearly 70% of these deaths attributed to cardiovascular diseases, emphasizing the importance of maintaining a normal BMI to mitigate risks (Afshin et al., 2017). Furthermore, research indicates that the association between BMI and HRQoL varies by sex and age. suggesting that the impact of BMI on quality of life is nuanced and influenced by demographic factors (M. Al-Thani et al., 2018).

Overweight. Overweight is a condition characterized by an excessive accumulation of body fat beyond what is considered healthy for an individual's height and body composition (WHO, 2024). It is typically diagnosed using Body Mass Index (BMI), where a BMI of 25 or higher indicates excess weight (Jakubiec et al., 2024). This condition results from an imbalance between calorie intake and energy expenditure and may contribute to various health risks, including metabolic disorders and cardiovascular diseases. Being overweight can place an additional burden on the body, affecting overall well-being, mobility, and quality of life (Segal et al., 2025). Overweight is defined in contemporary public health literature as a weight-status category indicating excess body weight relative to height, most commonly measured using the Body Mass Index (BMI). For adults, the World Health Organization (WHO) classifies overweight as a BMI of 25.0 to 29.9 kg/m^2, identifying it as a standardized threshold for assessing elevated weight status in relation to potential health risks. The Centers for Disease Control and Prevention (CDC) similarly designates BMI values from 25 to <30 as overweight, emphasizing the role of BMI as a practical screening tool for identifying individuals who may be at increased risk for weight-associated health concerns. Reinforcing these classifications, the American Heart Association (AHA) also recognizes BMI 25–29.9 kg/m^2 as the overweight range, noting that individuals within this category may face heightened vulnerability to cardiometabolic conditions, thereby underscoring BMI's continued use as a widely accepted benchmark for weight evaluation.

Obesity. Obesity is a chronic and multifaceted health condition characterized by an excessive accumulation of body fat, which can negatively impact overall well-being (Randazzo, 2024). It is associated with a higher likelihood of developing type 2 diabetes, cardiovascular diseases, and certain types of cancer. Additionally, obesity can compromise bone health, affect reproductive function, and impair daily activities such as movement and sleep, ultimately reducing the quality of life (World, 2024).

Obesity is also a significant risk factor for chronic diseases, including cancer. Chan et al. (2016) conducted a meta-analysis of 82 studies examining the relationship between BMI and breast cancer survival rates. The findings indicated that higher BMI negatively affected survival outcomes. reinforcing the need for targeted weight management strategies to improve prognosis. As new technologies emerge, innovative methods for BMI prediction and monitoring have gained attention. Leroy et al. (2024) introduced a predictive model for BMI trajectories using machine learning, demonstrating that multi-task Gaussian processes could accurately forecast BMI changes over time. This model offers a valuable tool for early obesity intervention and personalized healthcare planning.

Recent findings show consistent correlations between physical activity determinants and BMI across age groups. Moeini et al. (2021) reported that structured physical-activity interventions reduce adolescent BMI, while Zhang et al. (2023) found that lower habitual activity levels are linked to higher BMI among adolescents, influenced by demographic and psychosocial factors such as age, sex, and self-efficacy. Zaccagni and Gualdi-Russo (2025) further observed that pandemic-related declines in activity coincided with increases in BMI and obesity among youth. Moreover, adult-based evidence aligns with these patterns. Curran et al. (2023) identified psychological and social determinants such as intrinsic motivation and social support—as correlates of higher activity and lower BMI. Kettle et al. (2022) showed that primary-care-delivered interventions significantly improved activity levels and weight-related outcomes, and Hart (2021) reported that adults meeting aerobic or muscle-strengthening guidelines had lower BMI than those not meeting recommended activity targets, further reinforcing the link between active lifestyles and healthier weight status.

A substantial and growing body of research shows that dietary habits consistently correspond with BMI outcomes across age groups. The USDA Nutrition Evidence Systematic Review (2020) reports that dietary patterns low in fruits, vegetables, and whole grains but high in added sugars, refined grains, and processed meats are associated with elevated BMI and increased obesity risk, especially among children and adolescents. Furthermore, a scoping review by Lee et al. (2023) identified frequent intake of energy-dense foods, irregular meal patterns, and overall poor diet quality as behaviors strongly linked to higher BMI and obesity prevalence among young adults. Moreover, Pereira et al. (2022) found that adolescents who engaged in unhealthy lifestyle patterns, particularly consumption of calorie-dense, nutrient-poor foods, showed increases in BMI over time, reinforcing diet's central role in weight-status development. Evidence from adult populations aligns with these findings, with the USDA Nutrition Evidence Review (2020) again identifying high-sugar, high-refined-grain diets as contributors to elevated BMI. Reger et al. (2024) likewise reported that stronger adherence to sustainable, plant-forward dietary patterns significantly reduced the risk of overweight and obesity (RR = 0.69; RR = 0.61). Additionally, long-term cohort data from Tsuzaki et al. (2024) showed that higher diet-quality scores were consistently associated with lower BMI over a 20-year period, while Rein et al. (2024) noted that adults with higher BMI tended to consume more

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animal-based proteins and fewer plant-based foods, reflecting clear behavioral patterns related to weight status. Furthermore, 2025 evidence from the Dietary Guidelines Advisory Committee demonstrates that plant-rich dietary patterns low in processed meats, refined grains, and added sugars correspond with lower adiposity across ages; and Berthy et al. (2025) found that strong adherence to the EAT-Lancet diet predicted less weight gain and lower obesity incidence in a large French cohort. Lastly, a 2025 meta-analysis by Wang et al. (2025) showed that intermittent fasting protocols produce significant reductions in BMI and body weight among overweight and obese adults, highlighting the effectiveness of structured dietary patterns in weight control.

1.4.4. Issues on BMI

There are issues on BMI, that the Centers for Disease Control and Prevention explains that BMI is a height-adjusted weight index that does not distinguish fat mass from lean mass so a highly muscular person can be labeled "overweight/obese," and a person with low muscle mass can fall in the normal range despite excess adiposity; accordingly, CDC classifies BMI as a screening tool that must be interpreted alongside clinical information rather than a direct measure of body fat or health (Centers for Disease Control and Prevention, 2025; Centers for Disease Control and Prevention, 2024). Furthermore, the World Health Organization notes that BMI cannot locate or quantify abdominal or visceral fat, the depot most strongly tied to cardiometabolic risk; WHO therefore advises complementing BMI with waist-related indices such as waist circumference, because individuals may show a normal BMI yet harbor metabolically adverse central adiposity, while some with higher BMI may carry less risky peripheral fat patterns (World Health Organization, 2025).

Moreover, adult thresholds (≥ 25 and ≥ 30 kg/m^2) do not adjust for sex-based differences in body composition, age-related shifts in fat and muscle, or ethnic variation in metabolic risk; CDC and WHO therefore urge clinical judgment when applying adult categories across diverse populations (Centers for Disease Control and Prevention, 2024; World Health Organization, 2025). Moreover, children and adolescents must not be assessed with adult cut-offs; instead, CDC specifies age- and sex-specific BMI-for-age percentiles because growth and maturation alter interpretation across the pediatric life course (Centers for Disease Control and Prevention, 2024).

Furthermore, BMI captures only weight relative to height, it omits diet quality, physical activity, cardiorespiratory fitness, metabolic markers (lipids, glucose), and clinical findings; public-health guidance therefore emphasizes that BMI cannot diagnose health status and should be read within a broader clinical and behavioral assessment to avoid misclassification among both higher-BMI and normal-BMI individuals (Centers for Disease Control and Prevention, 2025; World Health Organization, 2025). Furthermore, CDC cautions that overreliance on BMI can reinforce weight-based labeling and stigma and recommends person-first language and holistic evaluation (Centers for Disease Control and Prevention, 2024; Centers for Disease Control and Prevention, 2025). Moreover, both CDC and WHO recommend pairing BMI with waist circumference, body-composition tools, and metabolic indicators to strengthen risk stratification and move beyond reliance on BMI alone (World Health Organization, 2025; Centers for Disease Control and Prevention, 2025).

Additionally, Moeini et al. (2021) reported that structured physical-activity interventions reduce adolescent BMI, while Zhang et al. (2023) observed that lower habitual activity shaped by age, sex, and self-efficacy, corresponds to higher adolescent BMI; during the pandemic, Zaccagni and Gualdi-Russo (2025) further documented widespread activity declines alongside increases in youth BMI and obesity. Extending to adults, Curran et al. (2023) identified psychological and social determinants including intrinsic motivation and social support as correlates of higher activity and lower BMI; in clinical contexts, Kettle et al. (2022) showed that primary-care–delivered interventions raise moderate-to-vigorous activity and improve weight-related indicators, and Hart (2021) found that meeting aerobic or muscle-strengthening guidelines is associated with lower BMI. On diet, the USDA Nutrition Evidence Systematic Review (2020) concluded that patterns high in added sugars and refined grains and low in fruits and whole grains align with higher BMI, a theme echoed by Lee et al. (2023) for young adults and by Pereira et al. (2022) for adolescents over time; conversely, Reger et al. (2024) linked adherence to sustainable, plant-forward diets with lower risks of overweight and obesity, Tsuzaki et al. (2024) associated higher long-term diet-quality scores with lower BMI, Rein et al. (2024) described higher-BMI adults' greater reliance on animal-based proteins and lower plant intake, the 2025 Dietary Guidelines Advisory Committee affirmed plant-rich patterns and lower adiposity across ages, Berthy et al. (2025) tied EAT-Lancet adherence to less weight gain and lower obesity incidence, and Wang et al. (2025) showed intermittent fasting significantly reduces BMI among adults with overweight or obesity. Interpreting these associations requires caution because, as the CDC explains, BMI is a height-adjusted screening index that neither separates fat from lean mass nor diagnoses health, and as the WHO emphasizes, does not capture visceral adiposity; both authorities therefore recommend pairing BMI with waist measures, body-composition assessments, and metabolic indicators and urge clinical judgment to address variation by age, sex, and ethnicity and to avoid stigma from overreliance on a single metric.

In summary, literature consistently shows that both physical activity and dietary habits are strongly associated with BMI across age groups. Structured physical-activity interventions have been shown to reduce adolescent BMI, as reported by Moeini et al. (2021), while Zhang et al. (2023) noted that lower habitual activity shaped by demographic and psychosocial factors is linked to higher BMI, a pattern that intensified during the pandemic according to Zaccagni and Gualdi-Russo (2025). In adults, psychological and social determinants also play a role, with Curran et al. (2023) identifying motivation and support as contributors to higher activity and lower BMI, supported by findings from Kettle et al. (2022) and Hart (2021) showing that meeting activity guidelines improves weight-related outcomes. Dietary research aligns with these trends, as the USDA Nutrition Evidence Systematic Review (2020) and Lee et al. (2023) associate nutrient-poor, high-sugar, high-refined-grain diets with elevated BMI, while Pereira et al. (2022) found that such patterns contribute to rising BMI among adolescents. By contrast, plant-forward and higher-quality diets, including those examined by Reger et al. (2024), Tsuzaki et al. (2024), and the Dietary Guidelines Advisory Committee (2025) are linked to lower BMI, with additional evidence from Berthy et al. (2025) and Wang et al. (2025) showing reduced weight gain and BMI through sustainable diets or intermittent fasting. Interpreting these relationships requires caution, as the Centers for Disease Control and Prevention (2024, 2025) and the World Health Organization (2025) emphasize that BMI is only a screening index that cannot distinguish fat from muscle or assess visceral adiposity, and should therefore be paired with waist measures, body-composition assessments, and clinical judgment for accurate evaluation.

2. Methodology

This chapter presents the research design, study location, participants, research instruments, data collection methods, and data analysis procedures. Additionally, it outlines the sequence of the research process, key areas of emphasis, the integration of methods, a procedural framework, methodological challenges, study trustworthiness, and ethical considerations.

2.1. Research Design

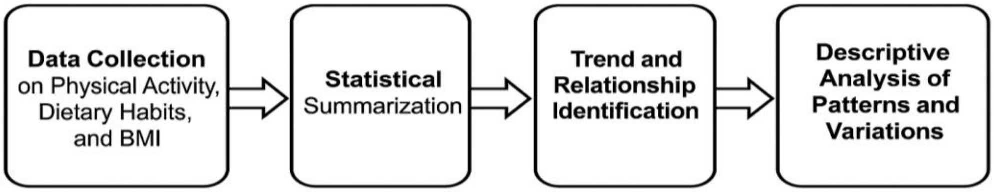
This research adapts a quantitative descriptive design to explore the influence of physical activity determinants, dietary habits to BMI. The procedure is collecting and analyzing quantitative data to identify trends and correlations of the variables, (Creswell & Plano Clark, 2018).

Quantitative research is a systematic approach that centers on gathering and analyzing numerical data to uncover meaningful trends, patterns, or associations within a population (Ghanad, 2023; Bhandari, 2020). One common design under this method is correlational research, which investigates whether the influence exist between two or more variables, and if so, how weak or strong those connections are (Privitera, 2024). Unlike experimental designs, correlational studies do not involve manipulation; instead, they allow researchers to observe variables in real-world conditions. This makes them especially useful when experiments are impractical or ethically challenging (Creswell & Creswell, 2018). Although correlational research cannot establish cause-and-effect relationships, it serves as a valuable tool for identifying links that may guide future investigations and support data-informed decisions (Fraenkel & Wallen, 2019).

A quantitative-descriptive research design provides a structured and data-driven approach to examining measurable variables such as physical activity levels, dietary patterns, and Body Mass Index (BMI) classification. This design emphasizes the collection of numerical data from a defined population and the use of descriptive statistical techniques to summarize, compare, and identify patterns within the data. By focusing on frequencies, percentages, means, and relationships among variables, the approach allows trends and distributions across larger groups to be clearly identified and objectively described. The strength of the quantitative-descriptive design lies in its ability to present precise, replicable findings that accurately reflect observable characteristics and behavioral patterns within the study population, thereby supporting evidence-based understanding of health-related factors (Creswell & Creswell, 2018).

Figure 3 illustrates the quantitative-descriptive design in this study. This study adopts a quantitative-descriptive research design to examine numerical patterns associated with physical activity, dietary habits, and Body Mass Index (BMI) among college students enrolled in DACS member institutions. The design focuses on the systematic collection of measurable data for each variable and the organization of these data into descriptive statistical outputs such as frequencies, percentages, means, and correlation coefficients. Through these statistical procedures, the study aims to objectively describe existing trends, variations, and statistical relationships among the identified lifestyle factors. Emphasis is placed on quantifying the prevalence and distribution of behaviors and conditions and determining how these variables relate within the study population. By relying exclusively on numerical data and statistical analysis, the study provides an objective and factual description of students' health-related behaviors and conditions, establishing an evidence-based foundation for understanding patterns that may influence overall well-being.

Figure 2. *Quantitative-Descriptive Design*



2.2. Place of the Study

This quantitative-descriptive study is conducted in selected higher education institutions affiliated with the Davao Association of Catholic Schools (DACS) located in Region XI, also known as the Davao Region. Region XI is composed of the provinces of Davao Occidental, Davao del Sur, Davao Oriental, Davao del Norte, and Davao de Oro. The region includes several component cities, municipalities, and barangays, with Davao City serving as its primary urban center due to its large population and concentration of educational institutions.

Davao City hosts a significant number of DACS-affiliated higher education institutions, several of which offer physical education (PE) programs. These institutions provide an appropriate and accessible setting for the systematic collection of quantitative data from students enrolled in PE courses. The presence of multiple DACS-affiliated schools within the city allows the study to obtain numerical data from a diverse student population while maintaining consistency in institutional and academic context.

Region XI is selected as the research environment because it offers a suitable academic setting that supports structured quantitative data gathering. The study focuses on measuring physical activity determinants, dietary habits, and Body Mass Index (BMI) among college students enrolled in PE programs within the selected institutions. By concentrating on this defined population and location, the research seeks to accurately describe numerical trends, distributions, and statistical relationships among the variables under investigation. The academic environment of DACS-affiliated institutions ensures that the data collected are relevant to educational and health-related contexts and suitable for descriptive statistical analysis.

2.3. Participants

The participants of this quantitative-descriptive study are college students aged 18 years and above who are officially enrolled in physical education (PE) courses in five higher education institutions affiliated with the Davao Association of Catholic Schools (DACS) in Region XI during the first semester of Academic Year 2025–2026. Eligibility for inclusion is based on current enrollment in PE classes within the selected institutions, ensuring that participants belong to the target population relevant to the variables under investigation.

These students represent a defined and appropriate population for examining measurable variables related to Body Mass Index (BMI), physical activity determinants, and dietary habits. By focusing on students actively taking PE courses, the study captures numerical data reflective of health-related behaviors and conditions within an academic physical education context.

The total population of students enrolled in PE courses across the five DACS-affiliated institutions is estimated at 13,100. This population includes approximately 1,300 students in School A, 950 in School B, 4,500 in School C, 2,800 in School D, and 3,550 in School E.

A target sample size of 300 participants is determined using the Raosoft Sample Size Calculator, applying a 95% confidence level, a 5% margin of error, and a 50% response distribution. These parameters ensure that the selected sample size is statistically adequate and representative of the larger population, allowing for reliable descriptive analysis and interpretation of numerical trends and relationships.

The study employs a stratified random proportionate sampling technique to ensure accurate representation of students across the five participating institutions. In the first stage of stratification, the total population is divided according to school affiliation. Participants are then randomly selected from each institution in proportion to its share of the overall PE student population.

Based on proportional allocation, the estimated distribution of respondents includes approximately 30 students from School A, 22 from School B, 103 from School C, 64 from School D, and 81 from School E. In the second stage of stratification, participants within each institution are further categorized by year level, specifically first-year and second-year PE students. Where preliminary enrollment data are unavailable, an initial proportional allocation is applied, with final adjustments made upon confirmation of official enrollment figures to maintain accuracy.

This two-stage stratified proportionate sampling approach enhances the reliability and descriptive accuracy of the findings by ensuring that key subgroups within the population are represented according to their actual distribution. By reflecting variations across institutions and year levels, the sampling method supports the study's objective of objectively describing numerical patterns, distributions, and relationships among the selected variables.

2.4. Research Instruments

This quantitative-descriptive study utilizes standardized research instruments specifically designed to measure numerical data related to physical activity determinants, dietary habits, and Body Mass Index (BMI). The instruments consist of structured survey questionnaires containing closed-ended items that allow responses to be quantified and subjected to descriptive statistical analysis. These instruments are selected to ensure that each variable is measured consistently and objectively across all participants.

To establish content validity and measurement reliability, the instruments undergo a thorough evaluation process involving expert review. Feedback and recommendations provided through this process are systematically incorporated into the final versions of the questionnaires to ensure clarity, appropriateness, and alignment with the study variables. In addition, the research employs previously validated and widely used survey instruments to enhance the accuracy, consistency, and comparability of the collected data.

The use of validated quantitative instruments strengthens the methodological rigor of the study by minimizing measurement error and supporting reliable numerical analysis. This structured approach ensures that the results accurately reflect measurable patterns, distributions, and relationships among the variables under investigation within the target population of tertiary students enrolled in DACS-affiliated institutions in the Davao Region.

The Physical Activity Determinants survey instrument, originally adapted from the work of Taylor et al. (2013), demonstrated an initial reliability coefficient of Cronbach's $\alpha = .70$. It encompasses ten key indicators: knowledge, environmental context and resources, motivation and goals, beliefs about capabilities, skills, emotion, social influences, beliefs about consequences, action planning, and coping planning. Following content validation and reliability testing conducted for this study, the instrument achieved an improved Cronbach's α of 0.94, indicating excellent internal consistency.

The researcher refined the questionnaire by categorizing all items under their respective domains to enhance clarity and organization. Participants assessed each statement using a five-point Likert scale, with the following response options: 5 – Very High, 4 – High, 3 – Moderate, 2 – Low, 1 – Very Low. To evaluate the level of professional development, the study utilized a range of means, along with corresponding descriptions and interpretations, as outlined in the succeeding section.

Range of Means	Descriptions	Interpretations
4.20 – 5.00	Very High	Physical activity determinants are always observed.
3.40 – 4.19	High	Physical activity determinants are often observed.
2.60 – 3.39	Moderate	Physical activity determinants are sometimes observed.
1.80 – 2.59	Low	Physical activity determinants are rarely observed.
1.00 – 1.79	Very Low	Physical activity determinants are never observed.

The second part of the questionnaire pertains to Dietary Habits, originally developed by Perić et al. (2020), which reported an initial reliability coefficient of Cronbach's α = .709. The instrument consists of two dimensions: the Time and Job Management (TJM) factor and the Knowledge and Self-Control factor. Following the validation procedures conducted for the present study, the instrument demonstrated an improved reliability rating, yielding a Cronbach's α of 0.94.

The questionnaire items were refined to suit the study's context, ensuring clarity and appropriateness for participants. Each statement assessed using a five-level Likert scale, offering response choices categorized as follows: 5 – Very High, 4 – High, 3 – Moderate, 2 – Low, 1 – Very Low. To evaluate the student's dietary habits, the researcher will employ a structured range of means, along with corresponding descriptions and interpretations.

Range of Means	Descriptions	Interpretations
4.20 – 5.00	Very HIgh	A positive dietary habit is always manifested.
3.40 – 4.19	High	Positive dietary habits are often manifested.
2.60 – 3.39	Moderate	Positive dietary habits are sometimes manifested.
1.80 – 2.59	Low	Positive dietary habits are rarely manifested.
1.00 – 1.79	Very Low	Positive dietary habits are never manifested.

To better understand how physical activity determinants and dietary habits influence Body Mass Index (BMI) among students, this study will use the Asian BMI classification to provide results that are more applicable to the target population. BMI were calculated using self-reported height and weight applying the standard formula: BMI = weight (kg)/height (m^2). To ensure relevance to the Filipino context, the study will apply the Asia-Pacific BMI classification established by the World Health Organization (WHO, 2004), which identifies overweight at BMI $\geq$ 23 kg/m^2 and obesity at BMI $\geq$ 25 kg/m^2 (Shutova et al., 2022). These lower cut-off points reflect research indicating that

Asian populations, including Filipinos, face higher risks of developing obesity-related health issues such as heart disease and diabetes at lower BMI levels compared to Western populations (Wen et al., 2008; Wen et al., 2009).

In the Philippines, studies have shown that the prevalence of overweight and obesity has been rising, particularly among adolescents and young adults. The application of Asia-Pacific BMI cut-off points provides a more accurate assessment of health risk among Filipinos, ensuring that early interventions can be implemented before individuals reach higher BMI categories associated with severe health complications (Tan & WHO expert consultation, 2025). By using this classification, public health initiatives, nutrition programs, and physical education policies in the country can be better tailored to address the growing obesity epidemic and promote healthier lifestyles.

The following is the Asia-Pacific Body Mass Index (BMI) classification, which varies from the World Health Organization (WHO) criteria in distinguishing overweight and obesity (Lim et al., 2017). Based on the Asian cut-off points, BMI is categorized as underweight (<18.5 kg/m^2), normal weight (18.5-22.9 kg/m^2), overweight (23-24.9 kg/m^2), and obese (≥25 kg/m^2). While the underweight classification remains the same as the WHO standard, the cutoff points for normal weight, overweight and obesity differ. According to WHO guidelines, normal weight ranges from 18.5 to 24.9 kg/m^2, overweight is classified as 25-29.9 kg/m^2, and obesity is defined as ≥30 kg/m^2. These differences emphasize the value of adopting region-specific Body Mass Index (BMI) thresholds, especially for Asian populations who are more susceptible to metabolic disorders such as diabetes and cardiovascular disease even at comparatively lower BMI levels than their Western counterparts. This suggests that using a universal standard may overlook at-risk individuals in certain populations, leading to the need for more culturally and biologically appropriate health assessments (Dilhara et al., 2023).

BMI	Classification
<18.5	Underweight
18.5 - 22.9	Normal Weight
23.0-24.9	Overweight
25.0 - 29.9	Obese

Before gathering any data, the three survey instruments selected for this study go through a reliability check to confirm that they consistently and accurately measured what they are intended to assess. This process is essential to ensure that the survey questions are clear, function cohesively, and produce stable results regardless of who responds or where the data is collected. One widely used approach for this is testing internal consistency through Cronbach's alpha, which indicates how closely related the items in each questionnaire are in measuring the same concept.

2.5. Data Collection

This quantitative-descriptive study follows a structured and systematic data collection process designed to ensure accuracy, consistency, and reliability of numerical data. Prior to data collection, formal institutional permission was obtained from relevant academic authorities and participating DACS-affiliated higher education institutions in Region XI. These approvals allowed the researcher to administer standardized measurement procedures and survey instruments within the selected schools.

Data collection was conducted through face-to-face sessions in designated school facilities. Eligible participants were identified based on their enrollment in physical education (PE) courses and were gathered according to scheduled data collection periods coordinated with school administrators and PE instructors. During each session, participants underwent standardized anthropometric measurement procedures to obtain height and weight data, which were used to compute Body Mass Index (BMI) using established BMI formulas. These measurements were conducted uniformly to ensure consistency across participants.

Following BMI measurement, participants completed structured, self-administered questionnaires designed to collect quantitative data on physical activity determinants and dietary habits. The questionnaires consisted of closed-ended items that allowed responses to be numerically coded and aggregated for statistical analysis. Each completed questionnaire was assigned a unique identification code to facilitate data organization and ensure accurate matching of survey responses with BMI measurements.

The data collection process was time-efficient and standardized, with each participant completing all measurement and survey activities within a single session. Completed questionnaires were reviewed for completeness before inclusion in the dataset. All collected responses were compiled into a numerical database and prepared for descriptive statistical analysis, including computation of frequencies, percentages, means, and correlation coefficients.

This structured data collection procedure ensures that the study yields reliable numerical data suitable for objectively describing patterns, distributions, and statistical relationships among physical activity determinants, dietary habits, and Body Mass Index (BMI) within the target population of college students.

2.6. Data Analysis

This study utilized both quantitative and qualitative analysis to examine the relationship between determinants of physical activity, students' dietary habits, and Body Mass Index (BMI).

In the quantitative phase, specific analytical techniques were employed to analyze the data collected from the survey responses.

Mean was used to determine the overall level of students' physical activity determinants and dietary habits. This helped describe the average responses, giving a clearer picture of typical patterns and behaviors among the participants.

Standard deviation measures how much the responses differ from the average. A bigger value means there's a wider range in how students answered. In this study, it helps reveal how much variation exists in the factors influencing physical activity and the eating habits of the students.

Frequency was used in the study to show how often certain responses or behaviors occur among students, such as how many engage in specific physical activities or follow particular dietary habits.

Regression analysis was used in the study to examine how physical activity determinants and dietary habits influence students' Body Mass Index (BMI). This method helped identify whether these variables significantly predict changes in BMI, allowing the researcher to understand the strength and direction of their relationship.

2.7. Methodological Issues

This study utilizes a quantitative-descriptive research design to systematically collect and analyze numerical data related to Body Mass Index (BMI), determinants of physical activity, and students' dietary habits. The design focuses on obtaining measurable information from a defined group of participants and organizing these data into statistical summaries such as frequencies, percentages, means, and correlations. Through these procedures, the study aims to identify existing patterns, trends, and relationships among the variables without engaging in interpretive or narrative inquiry. By relying exclusively on quantifiable evidence, this approach provides an objective description of students' health-related behaviors and conditions. The emphasis remains on producing statistically based insights that accurately reflect the prevalence and distribution of the selected lifestyle factors within the population, ensuring clarity, consistency, and reliability in the findings.

2.7.1. Research Design. One of the anticipated challenges in this study were the data collection process for both the quantitative and qualitative phases. The researcher needs to exert a significant effort to ensure the successful gathering of data from both approaches. Nevertheless, through unwavering dedication, mentorship from the research adviser, and valuable insights and suggestions from specialized technical and ethical reviewers, the researcher worked diligently to address any challenges that may arise. Maintaining patience and consistency, the researcher actively consult in collaboration with the mentor and evaluation committee to ensure adherence to the proper procedures required in a mixed-methods study, thereby upholding the study's validity and methodological rigor.

2.8. Ethical Considerations

In this quantitative-descriptive study, the role of the researcher is to ensure the systematic, accurate, and objective collection and analysis of numerical data related to Body Mass Index (BMI), physical activity determinants, and dietary indicators. The researcher is responsible for preparing standardized measurement tools, administering the instruments consistently across participants, and overseeing the organized recording of all quantitative responses. Throughout the process, the researcher maintains strict adherence to established protocols to minimize bias and ensure the reliability and validity of the data gathered. The researcher also manages the statistical organization of the dataset, ensuring that all procedures align with the descriptive design of the study.

The study is conducted within an institutional academic setting that provides the necessary facilities and resources for quantitative data collection. These include access to institutional research spaces, academic materials, and data-handling tools that support structured and systematic measurement of the variables under investigation. The environment allows for the efficient administration of survey instruments and the secure organization of the numerical data collected. Institutional resources also support the proper storage, processing, and preparation of the dataset for descriptive statistical analysis.

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Data collection follows a standardized sequence designed for quantitative-descriptive research. First, measurement instruments and survey forms are prepared and reviewed to ensure that each item corresponds to the variables being assessed, namely BMI, physical activity determinants, and dietary-related measures. Participants then complete the instruments under uniform conditions to maintain consistency across data points. After data gathering, the responses are organized into numerical datasets and checked for completeness and accuracy. These datasets are subsequently processed using descriptive statistical techniques such as frequencies, percentages, means, and correlations to identify patterns and distributions within the target population. All procedures are structured to ensure that findings are based solely on quantifiable evidence, consistent with the requirements of a descriptive research design.

3. Results

3.1. Status of Physical Activity Determinants of students in DACS-Affiliated Schools

As presented in Table 1.1, the status of physical activity determinants of students in DACS-affiliated schools has an overall mean of 3.74, described as high, which means that physical activity determinants are always observed. Considering the degrees of dispersion in this variable, the standard deviation is .67, indicating that the responses are relatively clustered around the mean.

Knowledge. This domain was rated by the students with a mean rating of 3.90, described as high. Items obtained mean ratings that range from 3.59 to 4.07. Particularly, the item, *having previously read information about the current nationally recommended PA guidelines,* reflects a mean rating of 3.59, while the item knowing *the recommended levels of physical activity* has a mean rating of 4.07.

Environmental Context and Resources. This domain reveals a mean of 3.98, described as high. In particular, the mean ratings range from 3.56 to 4.32. It shows that the item, *believing,* has the mean rating of 3.56, while the item having *available facilities to help them do physical activity reflects a mean rating of 4.12.*

Motivation and Goals. This domain was rated by the students with a mean rating of 3.75, described as high. Items obtained mean ratings that range from 3.45 to 4.15. Particularly, the item, *being bothered if they cannot do any physical activity,* reflects a mean rating of 3.45, while the item wanting *to do physical activity* has a mean rating of 4.15.

Beliefs about Capabilities. This domain reveals a mean of 3.88, described as high. In particular, the mean ratings range from 3.69 to 4.06. It shows that the item, *feeling confident when doing physical activity,* has a mean rating of 3.69, while the item, *believing that they are capable of doing physical activity,* has a mean rating of 4.06.

Skills. This domain has received a mean rating of 3.75 from the students in DACS-affiliated schools. It is described as high. Items obtained mean ratings that range from 3.61 to 3.83. Particularly, the item having *adequate sports skills to do physical activity* reflects a mean rating of 3.61, while the item *doing physical activity to a good enough standard* has a mean rating of 3.83.

Emotion. The respondents from DACS-affiliated schools rated this domain with a mean of

3.80, which is described as high. In particular, the mean ratings range from 3.66 to 3.87. It shows that the item*, feeling relaxed when they think about doing physical activity, has* a mean rating of 3.66, while the item*, believing that they can release their daily stress through physical activity,* has a mean rating of 3.87.

Table 1.1

Status of Physical Activityn Determinants In DACS-Affiliated Schools

	Mean	SD	Description
Knowledge			
1. Knowing the reasons why they should be meeting the nationally recommended PA guidelines	4.05	.92	High
2. Having previously read information about the current nationally recommended PA guidelines	3.59	1.12	High
3. Knowing the reasons why they should be meeting the nationally recommended PA guidelines	4.05	.92	High
Category Mean	**3.90**	**.80**	**High**
Environmental Context and Resources			
1. Having available facilities to help them do physical activity	4.32	.80	Very High
2. Having a place to do physical activity near them	4.05	1.00	High
3. Believing their local area is very attractive, and this encourages them to do physical activity	3.56	1.09	High
Category Mean	**3.98**	**.78**	**High**
Motivation and Goals			
1. Wanting to do physical activity	4.15	.95	High
2. Being bothered if they cannot do any physical activity	3.45	1.11	High
3. Feeling motivated to do physical activity	3.67	.99	High
Category Mean	**3.75**	**.84**	**High**
Beliefs About Capabilities			
1. Feeling confident when doing physical activity	3.69	1.05	High
2. Believing that they are capable to do physical activity	4.06	.91	High
3. Finding it easy to do physical activity when they see others doing well at physical activity like watching others run for a long time on the treadmill	3.89	1.00	High
Category Mean	**3.88**	**.85**	**High**
Skills			
1. Doing physical activity to a good enough standard	3.83	.91	High
2. Having adequate sports skills to do physical activity	3.61	1.05	High
3. Having the skills to keep going in physical activity sessions	3.80	.99	High
Category Mean	**3.75**	**.88**	**High**
Emotions			
1. Believing that they can release their daily stress through physical activity	3.87	1.06	High
2. having positive emotions which motivate them in doing physical activity	3.86	.98	High
3. Feeling relaxed when they think about doing physical	3.66	1.06	High

	activity			
	Category Mean	**3.80**	**.93**	**High**
Social Influences				
1.	Observing that their friends support or encourage their physical activity	3.91	.97	High
2.	Observing that the people they spend their free time with do physical activity	3.52	1.09	High
3.	Having someone to do physical activity with	3.40	1.27	High
	Category Mean	**3.61**	**.96**	**High**
Beliefs About Consequences				
1.	Benefitting them in the short term like burn calories, sleep better and others if they do PA	4.33	.78	Very High
2.	Benefitting them in the long term like live longer, lose weight and others if they do PA	4.47	.74	Very High
3.	Changing their life for the better through physical activity	4.43	.76	Very High
	Category Mean	**4.41**	**.68**	**Very High**
Action Planning				
1.	Tending to plan where their PA will happen like at the park, leisure center and others	3.75	1.06	High
2.	Planning when their PA will happen like Monday at 6pm or other time schedule	3.49	1.16	High
3.	Planning how their PA will happen like how to get there, kit needed and others	3.57	1.07	High
4	Planning what type of PA they will do like aerobics class, walking to work, session at the gym and others	3.67	1.12	High
	Category Mean	**3.62**	**.95**	**High**
Coping Planning				
1.	Knowing what to do in difficult situations in order to make sure they do the physical activity they have planned	3.55	1.05	High
2.	Being not easily distracted from the physical activity they have planned	3.34	1.11	Moderate
3.	Always working around obstacles to physical activity; nothing really stops them	3.30	1.16	Moderate
	Category Mean	**3.40**	**.99**	**High**
Goal Conflict				
1.	Being prepared to give up work ambitions to do physical activity	2.87	1.31	Moderate
2.	Being prepared to give up things they usually do in their leisure time for physical activity	3.11	1.23	Moderate
3.	Being prepared to give up spending time with their friends for physical activity	3.10	1.23	Moderate
	Category Mean	**3.03**	**1.16**	**Moderate**
	Overall Mean	**3.74**	**.67**	**High**

Social Influences. In this domain, a high mean rating of 3.61 in social influences is determined among students in DACS-affiliated schools. The item mean rating ranges from 3.40 to 3.91. Specifically, the item "having *someone to do physical activity with"* has a mean rating of 3.40, described as high, while the item *"observing that their friends support or encourage their physical activity"* has a mean rating of 3.91.

Beliefs about Consequences. The students in DACS-affiliated schools rated this domain with a mean rating of 4.41, which is described as very high. Items obtained mean ratings that range from 4.33 to 4.47. Particularly, the item benefitting *them in the short term like burning calories, sleep better and others if they do PA, has* a mean rating of 4.33, while the item benefitting *them in the long term like living longer, lose weight and others if they do PA,* has a mean rating of 4.47.

Table 1.2
The Status of Dietary Habits of Students in DACS-Affiliated Schools

		Mean	SD	Description
	Time and School Management			
1.	Eating their breakfast during school days.	3.35	1.35	Moderate
2.	Refraining from eating junk foods in between meals in school.	3.49	1.14	High
3.	Having adequate physical strength to sustain them with their school activities because they eat nutritious food.	3.56	.93	High
4.	Having three meals during the day.	3.32	1.33	Moderate
5.	Making it a habit to eat adequate vegetables and fruits daily.	3.34	1.11	Moderate
6.	Having enough time for a regular lunch during the day.	3.87	1.03	High
	Category Mean	**3.49**	**.80**	**High**
	Knowledge and Self-Control			
1.	Being able to balance the meals composition with their physical activity.	3.32	1.07	Moderate
2.	Having fresh vegetables dominate their daily menu.	2.91	1.19	Moderate
3.	Preparing food as recommended by experts	2.67	1.23	Moderate
4.	Considering the number of calories consumed during the day.	3.02	1.34	Moderate
	Category Mean	**2.98**	**.99**	**Moderate**
	Overall Mean	**3.24**	**.80**	**Moderate**

Action Planning. A category mean of 3.62, described as high, is reflected in the action planning of students in DACS-affiliated schools. In particular, the mean ratings in this category range from 3.49 to 3.75. It shows that the item*, planning when their PA will happen, like Monday at 6pm or another time schedule, has* a mean rating of 3.49, while the item*, tending to plan where their PA will happen, like at the park, leisure center and others* has a mean rating of 3.75.

Coping Planning. A high autonomy in coping planning is determined among students in DACS-affiliated schools with a mean rating of 3.40. The item mean rating ranges from 3.30 to 3.55. Specifically, the item "always *working around obstacles to physical activity; nothing really stops them"* has a mean rating of 3.30, while the item *"knowing what to do in difficult situations to make sure they do the physical activity they have planned"* has a mean rating of 3.55.

Goal Conflict. The students in DACS-affiliated schools generally rated their goal conflict as moderate, with a category mean of 3.03. In particular, the mean ratings in this category range from 2.87 to 3.11. It is shown that the item*, being prepared to give up work ambitions to do physical activity,* has the mean rating of 2.87. Meanwhile, the item*, being prepared to give up things they usually do in their leisure time for physical activity,* has a mean rating of 3.11.

3.2. Status of Dietary Habits of Students in DACS-affiliated schools

The data in Table 1.2 indicate the dietary habits of students in DACS-affiliated schools. As reflected, the overall mean of 3.24 is described as moderate. It means that positive dietary habits are sometimes manifested. In addition, its standard deviation of .80 is less than one, which shows that responses are clustered close to the mean.

Time and School Management. In terms of time and school management, the students in DACS-affiliated schools had shown a category mean of 3.49, which is described as high. Also, as shown in the table, item mean ratings range from 3.32 to 3.87. The item "having *three meals during the day"* reflects a mean rating of 3.32, while the item "having *enough time for a regular lunch during the day"* reflects a mean rating of 3.32.

Knowledge and Self-control. The mean ratings of the items in the domain of knowledge and self-control among students in DACS-affiliated schools range from 2.67 to 3.32. This domain reveals an average of 3.24 for knowledge and self-control. It is described as moderate. The item *preparing food as recommended by experts* reflects a mean rating of 2.67. Likewise, the item *being able to balance the meals' composition with their physical activity* garners a mean rating of 3.32.

3.3. Status of Body Mass Index of Students In DACS-Affilitated Schools

The status of the students' BMI in DACS-affiliated schools is summarized in Table 1.3. The data reveal that only about one-third of the student population, representing 38.2 percent, fall within the normal BMI range. This indicates that the majority of the students are experiencing some form of nutritional imbalance. Notably, nearly one-fourth of the respondents (24.9%) are categorized as obese, suggesting a significant portion of the population is at risk of weight-related health concerns. In addition, approximately one-fifth of the students, or 21.9 percent, are identified as underweight, highlighting another segment facing potential nutritional deficiencies. The remaining 15 percent of the respondents fall under the overweight category. Overall, the distribution shows that less than half of the students maintain a healthy BMI, underscoring the need for targeted health and nutrition interventions within DACS-affiliated schools.

To properly interpret the BMI distribution of students in DACS-affiliated schools as shown in Table 1.3, it is important to note that the study used the Asia–Pacific BMI classification. This regional standard applies cut-off points that differ from the World Health Organization (WHO) criteria, particularly in defining normal weight, overweight, and obesity. Under the Asia–Pacific guidelines, individuals are classified as underweight if their BMI is below 18.5 kg/m², within the normal range at 18.5–22.9 kg/m², overweight at 23–24.9 kg/m², and obese at 25 kg/m² and above.

Table 1.3
Status of Bosy Mass Index of Students in DACS-Affiliated Schools

Body Mass Index	Frequency	Percent, %
Underweight	**82**	**21.9**
Normal	**143**	**38.2**
Overweight	**56**	**15.0**
Obese	**93**	**24.9**
Total	**374**	**100.0**

3.4. Significance of the Physical Activity Determinants, and Dietary Habits on the BMI of Students in DACS Affiliated Schools

The data in Table 2 presents the results of the multiple regression analysis, which is set at a level of significance of α = 0.05 (two-tailed). The standardized beta coefficient of physical activity determinants is -0.16, with t-statistics of 2.52 and p = 0.012, which is less than the set .05 level of significance. The negative standardized coefficient of the status of physical activity determinants (-0.16) indicates that in individual capacity, as physical activity determinants increase, BMI tends to decrease. It means that for every unit increase in the status of physical activity determinants, there is a corresponding significant decrease of 0.16 in the status of the BMI of the students in DACS-affiliated schools.

Consequently, the standardized beta coefficient of dietary habits is 0.13, with a t-statistic of 2.08 and p = 0.038, which is less than the set .05 level of significance. This result indicates that in individual capacity, dietary habits are a significant predictor of the BMI of students in DACS-affiliated schools. It means that for every unit increase in the status of dietary habits, there is a 0.13 increase in the status of the BMI of students in the DACS-affiliated schools.

Table 2
Significance of the Influence of the Physical Activity Determinants, and Dietary Habits and the BMI of students in DACS-Affiliated Schools

	BMI			
Individual Influence of Predictors	Standardized Coefficient	t	p-value	Remarks
Physical Activity Determinants	-0.16	-2.52	0.012	Significant
Dietary Habits	0.13	2.08	0.038	Significant
Combined Influence of Predictors				
R	0.135			
R^2	0.018			
F	3.469			
P	0.032			Significant

Further, the *F*-ratio in Table 2 indicates whether the overall regression model, which is the combined effect of the independent variables, physical activity determinants, and dietary habits as predictors of BMI, is a good fit for the empirical data in this study. The F-value = 3.469 with p = 0.032 indicates that the overall model is statistically significant which means that together, physical activity determinants and dietary habits significantly predict BMI.

Furthermore, the R-square value reflects the proportion of variance in the BMI of students in DACS-affiliated schools that can be explained by physical activity determinants and dietary habits. The R-square value (R = 0.135) shows a weak correlation between the combined predictors (physical activity determinants and dietary habits) and BMI. It is also shown that $R^2 = 0.018$, which indicates that 1.8 percent of the variance in BMI can be explained by the two predictors included in this study. Though the value is small, in behavioral and health studies, especially with human variability, even small effects can be meaningful. The remaining 98.2 percent is attributable to the unexplained variance or other factors not included in this study.

4. Discussion

4.1. Status of Physical Activity Deerminants

The findings of the study indicate that the level of physical activity determinants among tertiary students enrolled in physical education (PE) classes in DACS-affiliated colleges and universities in Region XI is **high**. This result is based on the computed descriptive statistics derived from the assessment of eleven indicators of physical activity determinants, namely: knowledge, environmental context and resources, motivation and goals, beliefs about capabilities, skills, emotions, social influences, beliefs about consequences, action planning, coping planning, and goal conflict. Among these indicators, goal conflict was noted as frequently present based on the respondents' numerical ratings.

The high overall mean score suggests that physical activity determinants are widely evident among the students and play a measurable role in shaping their engagement in physical activity. These determinants influence observable aspects of students' physical activity behavior, including participation frequency, duration, and intensity. The results demonstrate that multiple individual and contextual factors contribute to students' physical activity patterns as reflected in the aggregated data.

The findings are consistent with previous quantitative studies in the literature. Brown et al. (2024) reported that factors such as environmental context and resources, social influences, motivation, beliefs about capabilities, knowledge, emotions, and behavioral regulation significantly affect students' physical activity engagement. Similarly, Zhang et al. (2022) found that individual and contextual predictors, including self-efficacy, social support, access to facilities, and motivation, are statistically associated with students' participation in moderate to vigorous physical activity. In addition, Taylor et al. (2013), through the validation of the Determinants of Physical Activity Questionnaire, demonstrated that these indicators effectively differentiate levels of physical activity engagement among student populations.

Overall, the descriptive results of the present study align with existing quantitative evidence, indicating that physical activity determinants are prominent among tertiary students enrolled in PE courses. The findings provide a numerical profile of how these determinants are distributed within the study population and confirm their relevance in describing students' physical activity behavior.

4.1.1. Environmental Context and Resources

The results of the study show that the level of **environmental context and resources** among tertiary students enrolled in physical education (PE) classes in DACS-affiliated institutions in Region XI is **high** and **often evident**. This finding is based on the computed descriptive statistics for this indicator, reflecting students' numerical responses regarding the availability and adequacy of facilities, safe spaces, and institutional support for physical activity. The high mean score indicates that environmental and resource-related factors are prevalent within the study population and contribute to conditions that support students' participation in physical activity.

These results are consistent with findings from previous quantitative studies. Kljajević et al. (2022) reported that access to campus facilities and institutional resources is significantly associated with higher levels of physical activity among university students. Similarly, von Sommoggy et al. (2020) found that the presence of accessible and activity-friendly campus environments is related to increased movement and physical activity participation. Wang et al. (2023) also documented that positive perceptions of environmental features, such as safety and walkability, are statistically linked to higher physical activity levels. The alignment of these studies with the present findings reinforces the descriptive evidence that environmental context and resources are a prominent determinant of students' physical activity behavior.

4.1.2. Beliefs About Consequences

The findings indicate that the level of **beliefs about consequences** is **very high** and **very evident** among the respondents. This result is reflected in the elevated mean score for this indicator, suggesting that students strongly recognize expected outcomes of physical activity. The numerical data show that beliefs regarding the perceived benefits of physical activity are widely present within the sample and are among the most prominent determinants measured in the study.

This result supports earlier quantitative research. Brown et al. (2024) and Taylor et al. (2013) reported that beliefs about the consequences of physical activity are a significant predictor of student engagement, with higher belief scores associated with higher levels of participation. Zhang et al. (2022) also found that students who report stronger expectations of physical and psychological benefits are more likely to engage in moderate-to-vigorous physical activity. The consistency between the present findings and existing literature confirms that beliefs about consequences are a highly evident determinant of physical activity among tertiary students.

4.1.3. Goal Conflict

The results further reveal that the level of **goal conflict** among the respondents is **moderate**. This indicates that while students experience competing demands between physical activity and other responsibilities, such as academic and personal tasks, these conflicts are present at a manageable level. The computed mean score suggests that goal conflict exists within the study population but does not dominate students' overall physical activity engagement.

This finding is supported by previous quantitative studies. Brown et al. (2024) identified goal conflict as a measurable factor influencing university students' physical activity levels, with moderate conflict associated with adjusted rather than discontinued participation. Taylor et al. (2013) also included goal conflict as an indicator differentiating levels of activity engagement among students. Swann et al. (2023) reported similar patterns, noting that students often balance competing commitments while maintaining some level of physical activity. These findings align with the present study, providing descriptive evidence that goal conflict is moderately evident and varies across individuals within the student population.

4.2. Status of Dietary Habits

The results of the study indicate that the overall status of dietary habits among tertiary students enrolled in physical education (PE) classes in DACS-affiliated colleges and universities in Region XI has a **mean score of 3.24**, which is interpreted as **moderate**. This level suggests that dietary habits are present but not consistently practiced by the respondents. The numerical results reflect variability in students' eating behaviors, indicating partial adherence to recommended dietary practices across the population.

These findings are consistent with previous quantitative studies describing dietary habits of college students as moderate or inconsistent. Acampado and Valenzuela (2018) reported that a substantial proportion of Filipino college students demonstrated below-average to moderate dietary habits based on computed descriptive measures. Similarly, Li et al. (2022) found that university food environments influence students' dietary behaviors, resulting in mixed diet quality outcomes. Almoraie et al. (2024) also documented moderate dietary patterns among university students, with statistical evidence showing irregularity in healthy eating practices. The alignment of these studies with the present findings supports the descriptive conclusion that dietary habits among tertiary students are moderately evident.

4.2.1. Time and School Management

The study further reveals that the level of **time and school management related to dietary habits** is **high** and **very evident**, based on the calculated mean scores for this indicator. This result indicates that students demonstrate a high level of organization in managing academic responsibilities in relation to meal planning and eating schedules. The descriptive statistics show that students are generally able to allocate time for meals despite academic demands.

Consistent with this finding, Acampado and Valenzuela (2018) identified time management as a significant factor associated with students' dietary behaviors. Li et al. (2022) likewise reported that students' ability to manage schedules influences meal timing and food selection, as reflected in survey-based quantitative analyses. Almoraie et al. (2024) also found that time-related factors show strong associations with dietary habit measures among university students. These studies support the present finding that time and school management is highly evident among the respondents, even though overall dietary habits remain moderate.

4.2.2. Knowledge and Self-Control

The results show that the level of **knowledge and self-control** in relation to dietary habits is **moderate**, based on the respondents' numerical ratings. This indicates that students demonstrate an adequate level of knowledge about healthy eating and exercise some degree of control over their food choices, though this control is not consistently maintained. The descriptive statistics suggest variation in how students apply nutritional knowledge in actual eating behaviors.

These results align with previous quantitative research. Acampado and Valenzuela (2018) found that students often possess adequate nutritional knowledge but still report moderate dietary habit scores. Almoraie et al. (2024) reported similar findings, noting that knowledge-related indicators showed moderate mean values in dietary assessments. Solomou et al. (2023) also documented statistical associations between stress factors and reduced consistency in dietary self-control among university students. The consistency of these findings with the present study indicates that knowledge and self-control are moderately evident and vary across individuals within the student population.

4.3. Status of Body Mass Index

This study employs the Asia-Pacific Body Mass Index (BMI) classification, which applies lower cut-off values for overweight and obesity compared with the World Health Organization (WHO) criteria. Based on this classification, BMI is categorized as underweight (< 18.5 kg/m²), normal weight (18.5–22.9 kg/m²), overweight (23.0–24.9 kg/m²), and obese (≥ 25.0 kg/m²). The Asia-Pacific standard is used to provide a more accurate categorical description of BMI distribution among Asian populations.

The results show that 38.2% of the respondents fall within the normal BMI range, indicating that more than one-third of the students are within the healthy weight category. However, a substantial proportion of students are classified outside the normal range. Underweight students account for 21.9%, overweight for 15.0%, and obese students for 24.9%, resulting in a combined 39.9% of respondents classified as overweight or obese. These findings describe a diverse BMI distribution within the population, with representation across all BMI categories.

Overall, the descriptive distribution indicates the presence of both underweight and overweight conditions among tertiary students enrolled in PE classes in DACS-affiliated institutions in Region XI. The numerical pattern reflects variation in BMI levels across the study population.

4.3.1. Underweight

The study shows that 21.9% of the participants are classified as underweight based on the Asia-Pacific BMI criteria. This proportion indicates that nearly one-fifth of the respondents fall below the normal BMI range. The presence of underweight students is reflected in the frequency distribution of BMI categories within the sample.

This finding is consistent with previous quantitative studies. Acampado and Valenzuela (2018) reported that a notable percentage of Filipino college students fall below the normal BMI range based on survey-derived anthropometric data. Similarly, Li et al. (2022) documented lower BMI classifications among subsets of university students, as reflected in their descriptive analyses of dietary and weight status. Almoraie et al. (2024) and Landry et al. (2022) also identified measurable proportions of underweight individuals within tertiary populations. These studies align with the present findings by demonstrating the continued presence of underweight classifications among college students.

4.3.2. Normal

The findings indicate that 38.2% of the respondents are classified as having a normal BMI according to the Asia-Pacific standard. This category represents the largest proportion of students within the sample, indicating that a considerable segment of the population falls within the healthy weight range. The frequency distribution suggests that normal BMI remains the most prevalent classification among the respondents.

This result aligns with existing quantitative research. Kljajević et al. (2022) reported that a substantial proportion of university students were classified within the normal BMI range based on anthropometric measurements. Zhang et al. (2022) similarly found that normal BMI categories constituted the largest group in their university-based studies. Li et al. (2022) also documented comparable distributions of normal BMI among tertiary students. These findings corroborate the present study's descriptive results.

4.3.3. Overweight

The results further show that 15.0% of the participants are classified as overweight under the Asia-Pacific BMI classification. This proportion indicates that a measurable segment of the study population exceeds the normal BMI range but does not reach the obesity threshold. The descriptive statistics reflect an observable concentration of students within the overweight category.

This finding is supported by quantitative evidence from previous studies. Zhang et al. (2022) reported similar overweight prevalence rates among university students based on BMI measurements. Li et al. (2022) likewise identified a comparable proportion of students classified as overweight. Saha et al. (2021) also documented overweight prevalence within Asian tertiary populations using similar classification standards. These studies provide empirical support for the descriptive pattern observed in this study.

4.3.4. Obese

The study indicates that 24.9% of the respondents are classified as obese according to the Asia-Pacific BMI cut-off. This percentage represents nearly one-fourth of the student population, indicating a substantial concentration of respondents within the highest BMI category. The frequency data show that obesity is more prevalent than the overweight category within the sample.

This result is consistent with findings from other quantitative studies. Zhang et al. (2022) identified comparable obesity prevalence rates among university students using Asia-Pacific BMI criteria. Li et al. (2022) found similar patterns in BMI distributions, with obesity representing a significant portion of the sample. Solomou et al. (2023) also reported elevated obesity rates among tertiary students based on self-reported and measured BMI values. The consistency across studies supports the descriptive accuracy of the present findings.

4.4. Significance of the Influence of Physical Activity Determinants and Dietary Habits on BMI

The results of the study demonstrate that **physical activity determinants have a statistically significant influence on Body Mass Index (BMI)** among tertiary students enrolled in physical education (PE) classes in DACS-affiliated institutions in Region XI. The regression analysis indicates that selected physical activity determinant indicators are significantly associated with BMI outcomes, suggesting measurable relationships between these variables within the study population.

This finding is consistent with prior quantitative research. Brown et al. (2024) and Zhang et al. (2022) reported significant statistical associations between environmental context and resources, social influences, motivation-related factors, and physical activity engagement, which were subsequently linked to BMI classification in university students. Similarly, Peng et al. (2022) reported that action planning and coping planning are statistically significant predictors of physical activity behavior, which in turn are associated with BMI outcomes based on regression analyses. The present study's findings align with these results, as key physical activity determinants exhibited significant associations with BMI values.

The regression results further show that environmental context and resources, social influences, and motivation-related indicators are significantly related to BMI classification. Students with higher numerical ratings on these physical activity determinant indicators tend to exhibit BMI values closer to the normal range. These observations are supported by Zhang et al. (2022), who found that greater engagement in moderate-to-vigorous physical activity and lower sedentary time were statistically associated with healthier BMI distributions among university students. Vasconcellos et al. (2020) likewise reported significant relationships between motivation quality and sustained physical activity participation, reflected in BMI outcomes across student populations.

In addition to physical activity determinants, **dietary habits also show a statistically significant relationship with BMI**, although the overall level of dietary habits in this study is described as moderate. The regression analysis indicates that dietary habit indicators contribute to the prediction of BMI values, highlighting the role of dietary-related behaviors in explaining BMI variation among respondents. This finding is consistent with Li et al. (2022), who reported significant associations between campus food environment characteristics, dietary behavior scores, and BMI classifications in tertiary students. Solomou et al. (2023) similarly found that diet quality indicators are statistically related to BMI and weight status among university populations.

When examined simultaneously in the regression model, **physical activity determinants and dietary habits jointly demonstrate a significant influence on BMI**. The combined explanatory power of these variables indicates that BMI variation among students is associated with the measured physical activity and dietary factors included in the study. These results are consistent with multiple quantitative studies reporting that physical activity-related variables and dietary behaviors significantly predict BMI when analyzed together (Brown et al., 2024; Li et al., 2022; Peng et al., 2022).

Overall, the findings confirm that both physical activity determinants and dietary habits are statistically significant predictors of BMI among tertiary students. The quantitative-descriptive results provide empirical evidence of measurable relationships among these variables, contributing to an objective understanding of BMI distribution within the study population and supporting existing regression-based findings in the literature.

5. Conclusions and Recommendations

5.1. Conclusions

The findings of this quantitative-descriptive study show that tertiary students enrolled in physical education (PE) classes in DACS-affiliated institutions generally demonstrate **high levels of physical activity determinants**. Descriptive statistics indicate elevated mean scores across indicators such as awareness, knowledge, motivation, perceived capability, and social influence. However, selected indicators related to consistency of participation, such as goal conflict, obtained moderate ratings, reflecting variability in physical activity engagement among the respondents.

The overall status of **dietary habits** among the students is described as **moderate**, based on the computed mean score. This level indicates that dietary practices are evident but not uniformly maintained across the population. Indicators related to time and school management obtained high ratings, while indicators related to knowledge and self-control were rated at a moderate level, suggesting variation in dietary-related behaviors among students.

The **Body Mass Index (BMI)** distribution reveals that students are represented across all BMI categories using the Asia-Pacific BMI classification. The largest proportion of respondents falls within the normal BMI range, while measurable proportions are classified as underweight, overweight, and obese. This distribution reflects variability in nutritional status among tertiary students.

Results of the **regression analysis** indicate that physical activity determinants and dietary habits are **statistically significant predictors of BMI**. Higher physical activity determinant scores are associated with lower BMI values, while dietary habit scores also show significant associations with BMI. However, the overall explanatory power of the regression model is low, indicating that only a small portion of BMI variability is accounted for by the variables included in the model.

In summary, the quantitative findings confirm that physical activity determinants and dietary habits are significantly related to BMI but explain a limited proportion of its variance. The results provide a descriptive statistical profile of students' physical activity determinants, dietary habits, and BMI and document measurable relationships among these variables within the study population.

5.2. Recommendations

Based on the quantitative results of the study, several recommendations emerge from the observed patterns, levels, and statistical relationships among physical activity determinants, dietary habits, and Body Mass Index (BMI) of tertiary students enrolled in DACS-affiliated institutions.

1. The **moderate rating of the goal conflict indicator** under physical activity determinants suggests that competition between academic demands and physical activity is present among students. Programs and institutional practices that account for this measured level of goal conflict may help reduce variability in physical activity engagement and support more consistent participation patterns among students.

2. The finding that **dietary habits were rated at a moderate level** indicates partial adherence to healthy eating practices. This result suggests a need for greater alignment between students' dietary knowledge and their observed eating behaviors, particularly in environments where food choice accessibility and convenience vary.

3. Since the **time and school management indicator obtained a high rating**, this result reflects a strong and consistent organizational capacity among students with regard to scheduling meals alongside academic responsibilities. Maintaining conditions that support balanced scheduling may help sustain this favorable pattern observed in the data.

4. The **moderate rating for the knowledge and self-control indicator** implies variability in students' ability to consistently apply nutritional knowledge. Strategies aimed at strengthening the link between knowledge and behavior may reduce this variability and improve the overall level of dietary habit indicators.

5. The **BMI frequency distribution**, which shows that approximately one-fifth of students are underweight, highlights the presence of lower-than-normal BMI classifications within the population. Focused monitoring of this subgroup may help clarify patterns associated with undernutrition observed in the quantitative results.

6. The combined proportion of students classified as **overweight (15%) and obese (approximately 25%)** reflects a substantial segment of the population above the normal BMI range. These observed frequencies suggest that weight-related variability is significant and warrants continued monitoring through institutional health assessments.

7. Given that the regression model explains only a **small proportion of BMI variance (R^2 = .018)**, future quantitative studies may benefit from including additional measurable predictors such as sleep patterns, sedentary behavior, mental health indicators, and socioeconomic variables. The use of objective measurement tools may also improve precision and strengthen explanatory models in subsequent research.

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