



Faculty of Medicine
University of Dhaka

**Prevalence of obesity and its association with physical activity
among undergraduate students in BHPI: a cross-sectional study**

Submitted by:

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B. Sc. in Physiotherapy

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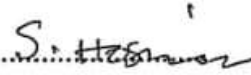
August, 2025

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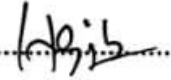
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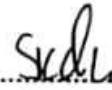
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Declaration

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation, or dissemination of information of the study, I would be bound to take written consent from the Supervisor & Department of Physiotherapy of Bangladesh Health Professions Institute (BHPI).

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Acronyms

BHPI	Bangladesh Health Professions Institute
BMI	Body Mass Index
IPAQ	International Physical Activity Questionnaire
IRB	Institutional Review Board
MET	Metabolic Equivalent of Task
PCOD	Polycystic Ovarian Disease
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

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Abstract

Background: Obesity is a major public health concern globally and increasingly affects university students due to sedentary behavior and poor lifestyle choices. In Bangladesh, the rising trend of obesity among undergraduates is linked to reduced physical activity, academic stress, and dietary changes associated with urbanization and campus life. **Objectives:** This study aimed to determine the prevalence of obesity and its association with physical activity among undergraduate students at Bangladesh Health Professions Institute (BHPI). Specific objectives included evaluating socio-demographic characteristics, measuring obesity levels through BMI, assessing physical activity levels, and analyzing the correlation between obesity and physical activity. **Methodology:** A cross-sectional study was conducted among 163 undergraduate students aged 18–25 at BHPI. Data were collected via structured face-to-face interviews using the International Physical Activity Questionnaire (IPAQ) and anthropometric measurements to calculate BMI. Data were analyzed using SPSS v27.0, and associations were tested using the Fisher-Freeman-Halton Exact Test. **Results:** Among 163 participants, 68.1% had normal BMI, 19.0% were pre-obese, 3.1% were obese (Class I), and 9.8% were underweight. Most students (82.2%) reported moderate physical activity, 17.8% had low activity, and none reported high levels. A statistically significant association ($p < 0.001$) was found between BMI and physical activity levels. **Discussion:** The findings highlight a moderate level of physical activity among most students, yet none reached high-intensity activity levels. Despite a majority having normal BMI, the presence of obesity and its link to physical inactivity signals a need for targeted interventions. Compared to studies in other regions, BHPI students exhibited better BMI outcomes but lower physical activity intensity. These findings suggest the importance of structured health programs at universities to promote active lifestyles. Future research should focus on longitudinal and qualitative methods to explore behavioral drivers and intervention outcomes across broader student populations.

Keywords: *Obesity, Physical Activity, Undergraduate, Bangladesh, BMI*

1.1 Background

Obesity is a condition characterized by excessive fat accumulation, which can adversely affect an individual's health (World Health Organization, 2024). It is typically measured using Body Mass Index (BMI), with a BMI of 25-29.9 classified as overweight and a BMI of 30 or above classified as obese ((Yousif, Kaddam and Humeda, 2019)). Overweight and obesity are associated with numerous health risks, including cardiovascular diseases, diabetes, hypertension, and certain cancers (Chauhan & Modi, 2019). In Bangladesh, as in many developing countries, the prevalence of obesity is rising rapidly, particularly in urban areas where lifestyle changes such as reduced physical activity and increased consumption of high-calorie foods are more common (Solayman et al., 2015)

Globally, the World Health Organization (WHO) estimates that more than 2.5 billion adults are overweight, with around 890 million adults living with obesity (World Health Organization: WHO, 2024). Bansal et al. (2024) identified a combined prevalence of 19.3% for overweight and obesity among South Asian youth, with individual estimates of 12.4% for overweight and 6.6% for obesity, underscoring a rising public health concern in the region. A systematic review found that the prevalence of obesity in Bangladesh is approximately 8.9%, with overweight rates at 13.6%(Bansal et al., 2024). Urban areas report obesity rates as high as 24% among adults (Mr et al., 2024). In rural populations, obesity prevalence is around 26.2%, with central obesity affecting 39.8% of individuals (Siddiquee et al., 2015). A study reported that 7.2% of students at Bangladesh were classified as obese, while 25% were overweight (Paul et al., 2015). This trend is not limited to adults, as children and young adults, including university students, are increasingly affected by obesity due to changing lifestyles that favor sedentary behaviors and high-calorie diets (Kazmi et al., 2021).

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure (World Health Organization, 2024). It is one of the most effective ways to prevent and manage obesity (Hruby and Hu, 2015). The World Health Organization recommends that adults, including university students, engage in at least 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity

aerobic activity per week to maintain a healthy weight and reduce the risk of chronic diseases (World Health Organization, 2019). Physical activity helps to balance energy intake and expenditure, improves metabolic health, and reduces the risk of obesity-related complications such as cardiovascular disease and diabetes (Kazmi et al., 2021; Varghese & Azeem, 2021).

For university students, maintaining an active lifestyle can be challenging due to academic pressures, increased screen time, and limited access to recreational facilities (Antony & Azeem, 2021). As a result, many students experience a decline in physical activity levels during their university years, which contributes to weight gain and the development of obesity. Research conducted in Peshawar, Pakistan, revealed that 13.7% of undergraduate students were physically inactive, while 52.9% were classified as overweight or obese (Kazmi et al., 2021). Similar trends have been observed in Bangladesh, where students' sedentary lifestyles and poor dietary habits are contributing to the rising prevalence of obesity (Sultana, 2021).

Obesity among undergraduate students is a growing concern in many countries, including Bangladesh. A study conducted at Jahangirnagar University found that 7.2% of students were obese and 25% were overweight, with males having a higher prevalence of obesity than females (Paul et al., 2015). In India, a study conducted among medical students revealed that 52.9% were either overweight or obese, with abdominal obesity present in 30.3% of the students (Chauhan & Modi, 2019). Similarly, research conducted in Malaysia reported that 15.9% of medical students were classified as pre-obese, while 5.2% were classified as obese (Gopalakrishnan et al., 2012). These findings highlight the widespread nature of the obesity epidemic among young adults in South Asia.

The prevalence of obesity among university students is concerning, as it increases the risk of developing chronic diseases later in life, including hypertension, type 2 diabetes, and cardiovascular diseases (Niranjan et al., 2016). Additionally, obesity can have psychological consequences, including low self-esteem, depression, and anxiety, which can further impact students' academic performance and overall well-being (Krishna et al., 2021).

The association between physical activity and obesity is well-established in the

literature. Physical activity helps regulate body weight by increasing energy expenditure, improving cardiovascular and metabolic health, and reducing the risk of chronic diseases (Cox, 2017). A study conducted among Sudanese medical students found that regular physical activity was associated with lower BMI levels, while students with low physical activity levels were more likely to be overweight or obese (Yousif et al., 2019). Similar trends have been observed in Bangladesh, where students who engage in regular physical activity are less likely to be obese (Sultana, 2021).

Despite the wealth of research on the relationship between physical activity and obesity, there are several limitations in the existing body of literature. Many studies rely on self-reported data, which may be subject to recall bias and inaccuracies. Additionally, cross-sectional studies, which are commonly used to assess the prevalence of obesity and physical activity levels, do not provide information on causality or long-term trends (Popat & Shabiethaa, 2023).

In Bangladesh, research on the prevalence of obesity and its association with physical activity among university students is still limited. Most studies focus on urban populations, where lifestyle factors may differ from rural areas. There is a need for more comprehensive research that includes both urban and rural students to better understand the factors contributing to obesity in different settings (Paul et al., 2015).

1.2 Rational

The prevalence of obesity is increasing across Asia, including Bangladesh. According to the World Health Organization (WHO), the prevalence of overweight and obesity in South-East Asia has risen significantly over the last few decades (WHO, 2021). In Bangladesh, a study found that the prevalence of overweight and obesity among university students was approximately 20% (Nahar and Rahman, 2019)). This trend necessitates focused research to understand contributing factors. The transition to university often involves significant lifestyle changes, including dietary habits and physical activity levels. Research indicates that students frequently adopt unhealthy eating patterns and reduce physical activity due to academic pressures and lifestyle changes (Hossain and Khatun, 2020). Understanding these shifts is crucial for developing effective interventions. Many university students do not engage in adequate physical activity, contributing to rising obesity rates. A study by Rahman and Islam (2021) found that only 25% of university students in Bangladesh met the recommended levels of physical activity. Identifying barriers to physical activity can help develop targeted interventions. Establishing healthy habits during university years is vital for preventing obesity-related diseases later in life. Due to the growing prevalence of obesity, and the related health risks that it is essential to investigate the prevalence of the condition and connection with physical activity in students studying in Bangladesh. While there is existing research on obesity and physical activity, studies specifically focusing on undergraduate students are limited. This research can fill gaps in the literature and contribute to a better understanding of this demographic. These findings will help in shaping public health policies and establishing specific interventions that aim to increase physical activity and fight obesity among students at universities in Bangladesh. The study is expected to aid in the overall effort to reduce the growing obesity epidemic in Bangladesh and boost the health of young people across the country.

1.3 Research question

What is the prevalence of obesity and its association with physical activity among undergraduate students in BHPI?

1.4 Aim of the study

To find out the levels of physical activity and prevalence of obesity among undergraduate students in BHPI.

1.5 Objectives

1.5.1 General objective

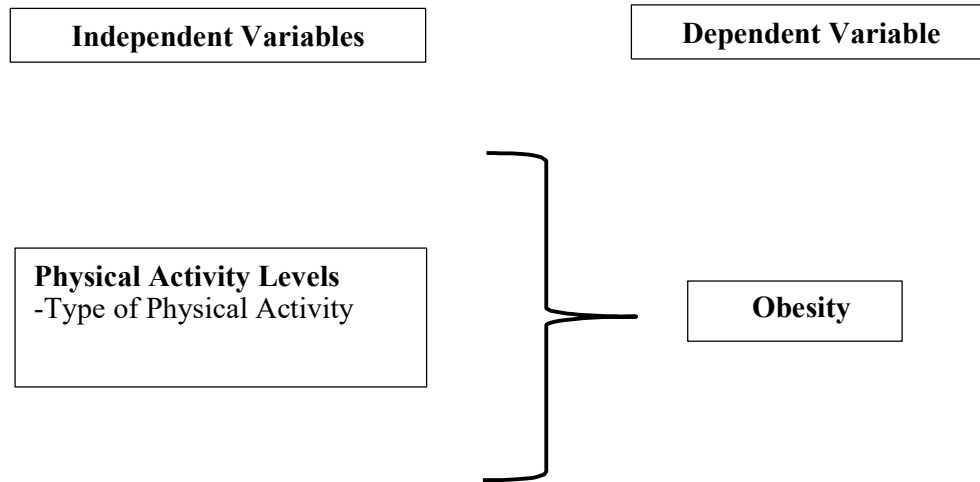
To determine the levels of physical activity and prevalence of obesity among undergraduate students in BHPI.

1.5.2 Specific objectives

To,

- Explore the socio-demographic state of undergraduate students in BHPI.
- Know the obesity prevalence among undergraduate students at BHPI.
- Determine the levels of physical activity among undergraduate students in BHPI.
- Determine association of obesity and physical activities.

1.6 Conceptual framework



1.7 Operational definition

Obesity

A Body Mass Index (BMI) greater than 30 is classified as obesity

Physical Activity

Physical exercise refers to intentional activities involving moderate or vigorous effort, such heavy lifting, aerobics, fast bicycling or light bicycling, doubles tennis, walking, done for at least 10 minutes at a time during the past 7 days.

Undergraduate Students

Individuals enrolled in a bachelor's degree program at the Bangladesh Health Professions Institute (BHPI), typically aged between 18 and 25 years, including students pursuing degrees in Occupational Therapy (OT), Physiotherapy (PT), and Speech and Language Therapy (SLT).

Obesity is widely acknowledged as a significant public health problem on a global scale, and it is especially prevalent among young adults who are enrolled in university settings. A Body Mass Index (BMI) of 30 or higher is typically used to determine whether or not an individual is obese. According to the World Health Organization (2020), obesity is defined as an abnormal or excessive accumulation of fat that poses a risk to one's health. According to Fitzgerald et al. (2018), the transition from high school to college frequently coincides with changes in lifestyle that can have a negative impact on students' health. These changes can include changes in dietary habits, levels of physical activity, and methods of stress management.

According to research, the environment of a university can be conducive to the development of unhealthy behavior's. Richard et al. (2015) found that students frequently experience increased academic pressures, which can lead to stress-induced eating and a lifestyle that is characterized by a lack of physical activity. Furthermore, the freedom that comes with being a student can lead to poor dietary choices. According to Barker et al. (2018), many students choose to consume convenience foods that are high in fats and sugars rather than choosing healthier options. According to Fitzgerald et al. (2018), the social culture that exists within universities frequently encourages sedentary leisure activities such as gaming and binge-watching television shows, which is another factor that contributes to the rise in the prevalence of obesity among school-aged children. The understanding of these dynamics among undergraduate students at institutions such as BHPI is essential for the development of effective public health strategies in Bangladesh, which is characterized by rapid urbanization and lifestyle changes (Khan et al., 2021).

The alarmingly high prevalence of obesity among undergraduates is a phenomenon that varies significantly across different regions and demographics. The prevalence of obesity among college students can vary from eight percent to more than twenty-five percent, depending on factors such as cultural norms, dietary habits, and lifestyle choices, according to a comprehensive analysis of research carried out in a number of countries (Barker et al., 2018; Kwan et al., 2018). Niranjana et al. (2016) conducted a study on medical students in India and found that 8.6% of male students and 11.7% of

female students were classified as obese. This finding suggests that there is a significant public health concern within this demographic. Further evidence from Popat and Shabieth (2018) revealed that among physiotherapy students in Navi Mumbai, 17% were at risk of obesity, with 18% identified as obese. This reveals a concerning trend among health professionals who are still in the process of obtaining their training. In their conclusion, the authors emphasized that these findings are reflective of broader concerns regarding lifestyle choices and health literacy among students, who are expected to embody and promote healthy living for themselves and others.

It is difficult to determine the full extent of the prevalence of obesity in Bangladesh because there are not enough comprehensive studies that are specifically focused on undergraduate students. However, research carried out in urban areas indicates that the prevalence of obesity among young people is increasing. Khan et al. (2021) conducted a study in which they discovered that urban adolescents in Bangladesh in Bangladesh were becoming increasingly overweight. This finding suggests that similar trends may also be observed in university populations. Due to the limited availability of targeted research, there is a pressing need for studies that directly address these issues within the context of Bangladeshi students.

One of the most important factors in preventing obesity and promoting overall health is engaging in physical activity. Despite this, there is a consistent body of evidence that demonstrates that the levels of physical activity among university students are frequently insufficient. According to research, a significant number of students do not meet the recommended guidelines for physical activity, which suggest that they engage in aerobic activity of at least 150 minutes per week at a moderate intensity (World Health Organization, 2020). In a study that was carried out by Shankar and Satheesh (2017), it was discovered that only a small percentage of undergraduates participated in regular physical activity. Furthermore, many of these students reported that their low activity levels were a significant contributor to their obesity. This aligns with the findings of Peltzer and Pengpid (2017), who reported that only 36 percent of university students in ASEAN met the guidelines for physical activity. This highlights the urgent need for interventions that aim to increase the amount of physical activity among this population. There are many factors that can prevent university students from engaging in physical activity. Some of these factors include the pressures of academics, a lack of

time, and restricted access to recreational facilities. Wright et al. (2018) observed that students frequently place a higher priority on their academics than they do on their physical activity. This tendency is made worse by the demands of their coursework and examinations. Furthermore, cultural factors may also play a role; in certain societies, there may be less of an emphasis placed on sports and physical fitness, which may result in lower participation rates among students (Kwan et al., 2018).

In addition, the environments on campus might not always be conducive to active lifestyles. Students may be dissuaded from participating in physical activity if they do not have access to facilities such as gyms, walking paths, or organized sports. According to Barker et al. (2018), one of the most effective strategies for increasing student participation in physical activities is to implement university-wide initiatives to promote physical fitness. These initiatives may include fitness classes or sports competitions.

A comprehensive understanding of the prevalence of obesity among college students requires a thorough examination of socio-demographic factors. The findings of numerous studies conclusively demonstrate that gender is a significant factor in the prevalence of obesity. Research conducted by Tiwari et al. (2014) demonstrates that male students typically have a higher prevalence of obesity compared to their female counterparts. Ghose and Dash (2021) conducted a comprehensive review of medical students and discovered that male students had a greater likelihood of being classified as overweight or obese than female students. This finding highlights the necessity of developing individualized health interventions that take into consideration gender-specific behaviors and attitudes regarding health.

Obesity is also significantly influenced by factors such as socioeconomic status and lifestyle choices. According to Zubair et al. (2018), students who come from families with lower socioeconomic status may have a more difficult time maintaining a healthy weight because they may have less access to recreational facilities and healthy food options within their school. According to Khan et al. (2021), urbanization in Bangladesh has been linked to an increase in the availability of fast food and processed foods, which contributed to the development of unhealthy dietary habits that contributed to an increase in the prevalence of obesity. Cultural factors also play a crucial role in shaping attitudes towards body image and health. In many societies,

cultural norms regarding body size can affect how obesity is perceived and addressed. In some cases, being overweight may be associated with affluence or health, which can undermine obesity prevention efforts (Richard et al., 2015). Understanding these socio-cultural contexts is vital for developing effective interventions that resonate with students' values and beliefs.

It is well established in the research that there is a correlation between physical activity and obesity. A significant number of studies have shown that a correlation exists between higher levels of physical activity and lower rates of obesity. Nooshabadi and Amiri (2021) discovered a significant inverse relationship between the levels of physical activity and obesity among university students. This finding highlights the importance of engaging in regular physical activity for the purpose of weight management.

According to the findings of a study conducted by Abou Elhaj et al. in 2020, which focused on university students in Lebanon, those who engaged in regular physical activity had significantly lower body mass index (BMI) scores when compared to their peers who engaged in sedentary activities. This finding highlights the significance of encouraging students to lead active lifestyles as a means of preventing obesity among the student population. In addition, Peltzer and Pengpid (2017) discovered that students who participated in physical activity were more likely to adopt healthier dietary behavior's. This finding suggests that there is a synergistic effect between diet and exercise in reducing the risk of obesity. Physical activity has a wide range of benefits, not just for managing weight. Physical activity on a consistent basis has been shown to improve mental health, lower stress levels, and enhance overall quality of life. These benefits are especially important for college students, who frequently experience high levels of academic pressure (Wright et al., 2018). The promotion of physical activity ought to be a top priority for educational institutions, not only because of the role it plays in preventing obesity but also because of the overall health benefits it offers.

Cross-sectional designs, which collect data at a single point in time, are utilized in a significant number of studies that investigate the relationship between obesity and physical activity among college students. This method restricts the ability to determine causality, even though it can offer insightful information about the relationships between variables (Tiwari et al., 2014). Studies that follow changes over time, known

as longitudinal studies, are required in order to gain an understanding of the ways in which physical activity influences obesity trends among students.

Moreover, relying on data that students have self-reported regarding their dietary habits and physical activity can introduce potential biases, as students may misreport their behavior's. For instance, self-reported levels of physical activity may be overestimated due to social desirability bias, which occurs when respondents provide answers that they believe are more favorable (Barker et al., 2018). Researchers ought to take into consideration the utilization of objective measures, such as accelerometers for the purpose of evaluating physical activity and validated methods for recalling dietary information, in order to improve the accuracy of their findings. In addition, the majority of the research that is currently available concentrates primarily on students who are majoring in medical and health sciences, frequently ignoring the experiences of students who are majoring in other fields. Through the expansion of research to include diverse populations across a variety of fields of study, a more comprehensive understanding of the factors that influence obesity and physical activity among all university students will be achieved (Kwan et al., 2018).

The incorporation of qualitative methods, such as interviews or focus groups, can also contribute to a deeper comprehension of the experiences, attitudes, and obstacles that students face when it comes to engaging in physical activity and maintaining a healthy diet. It is possible for such approaches to provide valuable context that cannot be captured by quantitative data alone, which can lead to interventions that are more tailored to the individual and more effective (Fitzgerald et al., 2018).

Yousif, Gadir and Kaddam (2019) found that there was a correlation between physical activity, eating behavior, and obesity among Sudanese medical students. The researchers employed the International Physical Activity Questionnaire (IPAQ) to assess the physical activity levels of the participants, while the Food Frequency Questionnaire (FFQ) and the Eating Behavior Questionnaire (EBQ) were utilized to evaluate their eating habits and behavioral patterns. To measure obesity, the study used Body Mass Index (BMI), a common and widely accepted tool for classifying obesity based on weight and height. The results indicated that both physical activity levels and eating behaviors were significantly correlated with obesity levels among the participants, suggesting that factors such as sensory deficits and reweighting strategies

play crucial roles in managing obesity, particularly in academic environments where sedentary lifestyles are common.

In 2020, Venkatrao et al. conducted a nationwide cross-sectional study to investigate the prevalence of obesity in India and its neurological implications. This study also sought to understand the neurological consequences of obesity, including the potential risk of developing disorders like stroke and cognitive decline. The researchers used Body Mass Index (BMI) to categorize participants, assessing obesity by measuring weight and height, which is a standard method used in population studies. While the study did not specify which particular neurological tests were used, it highlighted the pressing concern regarding the high rates of obesity in India, emphasizing that it could contribute to a growing public

health crisis, particularly in relation to neurological impairments and associated health risks. In 2016, Poobalan and Aucott conducted a systematic review aimed at exploring the prevalence of obesity among young adults in developing countries. By reviewing existing literature and data, the researchers focused on Body Mass Index (BMI) as the primary measure to assess obesity levels across diverse populations. The study highlighted the rising trend of obesity in young adults, particularly in developing countries, where changes in lifestyle and dietary habits have contributed to an increase in obesity rates. The authors discussed the long-term health implications of obesity, especially concerning chronic conditions such as diabetes and cardiovascular diseases, which are more likely to develop in populations with high obesity prevalence.

In 2016, Khan et al. examined the prevalence of preobesity and obesity among medical students in Lahore, Pakistan, and its association with dietary habits and physical activity. The study found that a significant portion of the medical student population was classified as either preobese or obese, with Body Mass Index (BMI) being the key metric used for assessment. The researchers also used self-reported questionnaires to evaluate participants' dietary habits and physical activity levels. The study concluded that unhealthy dietary habits, including high intake of processed foods, and low levels of physical activity were the primary contributing factors to the high prevalence of obesity among the students. This highlighted the need for interventions targeting healthier eating habits and increased physical activity, particularly in academic institutions where stress and sedentary lifestyles can contribute to weight gain.

In 2020, Uddin conducted a one-year prospective study on young adults in Bangladesh to explore the connections between physical activity, sedentary behavior, and psychological well-being. The study utilized the International Physical Activity Questionnaire (IPAQ) to measure physical activity levels, a self-reported tool to assess sedentary behavior, and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) to evaluate the mental health of the participants. The findings from this study showed a strong positive association between higher levels of physical activity and better psychological well-being. Conversely, the results indicated that increased sedentary behavior was linked to poorer mental health outcomes, including symptoms of depression and anxiety. This research emphasized the importance of encouraging physical activity as part of a holistic approach to improving mental health in young adults.

3.1 Study design

This research will be conducted using a cross-sectional study design, as it will be considered suitable to achieve the study goals. This design will involve collecting the necessary data at a single point in time from a group of BHPI undergraduate students. All measurements, including anthropometric data for assessing obesity and questionnaires to evaluate physical activity levels, will be carried out concurrently or within a limited period. For the study participants, the cross-sectional design will provide an overview of obesity prevalence and its correlation with physical activity.

3.2 Study area and site

Bangladesh Health Professions Institute. (The academic institute of Centre for the Rehabilitation of the Paralysed) Savar, Dhaka.

3.3 Study population

The study population included students studying at Bangladesh Health Professions Institute, ranging from first-year to fourth-year students.

3.4 Study duration

The study was conducted from 3rd November 2024 to 30th January 2025.

3.5 Inclusion criteria

- Undergraduate students in the Physiotherapy, Occupational Therapy, Speech and Language Therapy, Prosthetics, and Orthotics department at BHPI.
- Age group 18-25 years (Popat, Shabiethaa and Pol, 2023)
- Both Male and female.

3.6 Exclusion criteria

- Female students suffering from PCOD (Popat, Shabiethaa and Pol, 2023).
- Students who are not interested in participating.
- Postgraduate students.

3.7 Sample size

Sample was a group of subjects selected from population, who were used in a piece of research. A sample was a smaller group taken from the population. Sometimes, the sample size may be big, and sometimes, it may be small, depending on the population and the characteristics of the study. When the sample frame was finite, the equation of finite population correction in case of cross-sectional study was:

$$\begin{aligned}n &= \frac{z^2 pq}{d^2} \\ &= \frac{(1.96)^2 \times 0.1186 \times (1 - 0.1186)}{(0.05)^2} \\ &= \frac{0.4015}{(0.05)^2} \\ &= 162.631 \\ &= 163\end{aligned}$$

Where,

n = Sample size

z = linked to 95% confidence interval (use 1.96)

p = expected prevalence, 11.86% (Zamsad, Banik and Ghosh, 2019)

q = 1 - p (expected non-prevalence)

d = margin of error at 5% (standard value of 0.05)

The sample size was determined to be 163. However, the research was conducted for academic purposes, which resulted in time limitations. Therefore, 163 samples were collected by the researcher for the study.

3.8 Sampling technique

A random sampling technique was selected by the researcher to draw out the sample from the population.

3.9 Data collection methods.

Data for this study were collected through face-to-face interviews with participants. The researcher utilized an established and modified questionnaire specifically developed to gather socio-demographic information relevant to the study. The International Physical Activity Questionnaire (IPAQ) was employed to assess physical activity levels, a validated tool commonly used to measure physical activity in various populations. Additionally, anthropometric measurements such as height and weight were taken to calculate the Body Mass Index (BMI) of each participant, classifying them according to WHO BMI categories. The questionnaire included both structured and semi-structured questions, comprising mainly closed-ended questions, which are commonly used in survey research to ensure consistency and ease of analysis.

3.10 Data collection tools

The tools needed for the study were a Consent form, Questionnaire form, Scale- Body Mass Index (BMI)), International Physical Activity Questionnaire (IPAQ). The questionnaire consisted of three main sections. The first section collected socio-demographic details such as age, year of study, department, gender, and marital status. The second section focused on measuring weight and height to calculate BMI, classifying participants as underweight, normal, pre-obese, or obese (with different obesity classes). The third section utilized the IPAQ to assess physical activity over the past seven days, including vigorous, moderate, and walking activities, along with their frequency and duration. It also captured sedentary behavior by recording the average time spent sitting each day.

3.11 Outcome Measurement Tool

Body Mass Index (BMI):

BMI is a widely used measurement to assess body fat based on height and weight that applies to adult populations. It is calculated by dividing a person's weight in kilograms by the square of their height in meters (kg/m^2). BMI provides a continuous scale of body composition, ranging from underweight to normal weight, overweight, and various degrees of obesity. This measure helps classify individuals into categories that indicate potential health risks associated with their body weight. BMI is a simple and non-invasive tool that enables the estimation of obesity prevalence in the population, reflecting the continuum of body weight statuses from underweight to severe obesity.

International Physical Activity Questionnaire (IPAQ):

The IPAQ is a validated instrument widely used to measure physical activity levels across various populations. It captures information on the frequency, duration, and intensity of physical activities performed in different domains, including work, transportation, household chores, and leisure-time activities. Participants indicate their level of physical activity across a spectrum ranging from vigorous to moderate and walking activities. The IPAQ generates a continuous scale of activity levels, which are expressed in Metabolic Equivalent of Task (MET) minutes per week, allowing the classification of physical activity levels as low, moderate, or high. This tool enables the assessment of the participant's physical activity in relation to health recommendations, facilitating the examination of associations between physical activity levels and obesity.

3.12 Statistical Test

3.12.1 Determination of the Nature of Data

The variables collected in this study were classified as nominal, ordinal, or ratio, and their parametric or non-parametric properties were identified based on standard procedures (Hicks, 1999).

Table- 1: Data category:

Variables	Descriptions	Data Type
Age	Continuous age value	Ratio
Age Category	19–21, 22–24, 25–27 years	Ordinal
Gender	Male, Female	Nominal
Marital Status	Single, Married	Nominal
Department	Physiotherapy, OT, SLT	Nominal
Year of Study	First, Second, Third, Fourth	Ordinal
Average BMI	Mean BMI (kg/m ²)	Ratio
BMI Category	Underweight, Normal, Pre-obese, Obese	Ordinal
Physical Activity Level	Low, Moderate, High	Ordinal

3.12.2 Determination of Statistical Test

In this study, statistical analysis was conducted in two main phases: descriptive and inferential. Descriptive statistics were used to summarize the characteristics of the participants. Categorical variables such as gender, marital status, academic year, department, BMI category, and physical activity level were presented as frequencies and percentages, while continuous variables like age and BMI were expressed using means and standard deviations.

For inferential analysis, the Fisher-Freeman-Halton Exact Test was employed to examine the association between BMI categories and physical activity levels. This test was chosen instead of the Chi-Square Test due to the presence of small expected

frequencies in some cells of the contingency table, which violates one of the assumptions of the Chi-Square test. The Fisher-Freeman-Halton Exact Test is more appropriate for $r \times c$ tables with low expected counts, offering a more accurate estimation of the p-value in such cases.

According to Hicks, the Fisher-Freeman-Halton Exact Test extends the Fisher Exact Test to larger contingency tables by computing the exact conditional probability of the observed table (and more extreme tables), given fixed marginal totals. The probability of an observed table T under the null hypothesis of independence is given by:

$$P(T) = \frac{N! \cdot \prod_{i=1}^r \prod_{j=1}^c T_{ij}!}{\left(\prod_{i=1}^r R_i!\right) \cdot \left(\prod_{j=1}^c C_j!\right)}$$

Where:

- R_i = row totals
- C_j = column totals
- T_{ij} = observed frequency in cell (i,j)
- N = total number of observations

The test calculates the p-value as the sum of probabilities of all tables with the same marginal totals that are as extreme or more extreme than the observed table, assuming the null hypothesis.

The result of the test was statistically significant ($p < 0.001$), indicating a meaningful association between BMI category and physical activity level. This suggests that students with higher BMI values were more likely to report lower physical activity levels, and this relationship is unlikely due to chance.

3.12.3 Data Analysis Procedure

Data was analyzed through Statistical package of social science (SPSS) Version 26. Microsoft Excel 22 worksheet was used to create the most of the graphs and charts. Then based on parametric or non-parametric features, data was analyzed through descriptive and inferential statistics.

Hypotheses:

- **Null Hypothesis (H_0):** There is no significant association between BMI category and physical activity level.
- **Alternative Hypothesis (H_1):** There is a significant association between BMI category and physical activity level.

Level of Significance:

To find out the association of the study, the “p” value was calculated. A p-value of <0.05 was accepted as the significant result for health service research. If the p-value is equal to or smaller than the significant level, the results are said to be significant.

3.13 Rigor of the Study

This study was conducted with careful attention to methodological rigor and integrity. A structured and systematic approach was followed throughout the research process to ensure consistency and accuracy. The researcher remained neutral during data collection, taking care not to let personal experiences or biases influence participants or their responses. All data, whether favorable or unfavorable, were treated equally and recorded without judgment. Participant information was handled with strict confidentiality to maintain ethical standards. The findings presented in the results section were based solely on objective analysis, without any personal interpretation. Additionally, each component of the research was thoroughly reviewed and validated under the close supervision of the research advisor to uphold the quality and credibility of the study.

3.14 Ethical consideration

Ethical issues should be considered strictly. So, before starting the study, a formal project proposal was submitted to the department of physiotherapy and after verifying the proposal, permission was taken from Institutional Review Board (IRB) of BHPI to continue the study. This study followed the World Health Organization (WHO) & Bangladesh Medical Research Council (BMRC) guideline and strictly maintained confidentiality. Each participant was given an information sheet and a consent form. The information sheet and consent form clearly described the aims and objectives. The researcher verbally informed the participants about the subject and purpose of the

study. The researcher assured them that the confidentiality of personal information would be strictly maintained henceforth. The researcher ensured that the patient's care would not be affected by participating in this study. The participants had full rights to withdraw their participation in this study at any time. The researcher also agreed not to disclose the information provided to anyone other than the principal investigator. As the participants were informed about this study through the information sheet, they gave their consent through the informed consent form. The information collected from the participants was recorded anonymously. The researcher was available to the participants for any questions or queries related to the study. All sources cited and acknowledged appropriately. The field notes and answer sheets were not shared or discussed with others.

3.15 Inform consent

The aims and objectives of this study should be informed to the subjects verbally. Before conducting research with the respondents, it is necessary to gain consent from the subjects. A consent form was given to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any times. It should be assured the participant that her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participant will also be informed or given notice that the research result would not be harmful for them. It would be kept confidential. Every participant has the right to discuss about her problem with senior authorities.

The findings derived from the analysis of data collected from the participants are presented below in a summarized and visualized format. This section highlights the sociodemographic characteristics and health-related profiles of the participants, including body mass index (BMI), physical activity levels, and academic standing. These descriptive statistics provide foundational insights into the study population, serving as a basis for further analysis related to physical function and associated outcomes.

4.1 Age range of participants

Among 163 participants, the majority of participants ($n = 80$) were in the age group of 19–21 years. This was followed by 72 participants in the 22–24 years' category. A relatively small proportion of respondents ($n = 11$) fell within the 25–27 years' age group. The cumulative percentage indicates that 93.3% of the total sample were aged between 19 and 24 years, reflecting a predominantly younger population in the study.

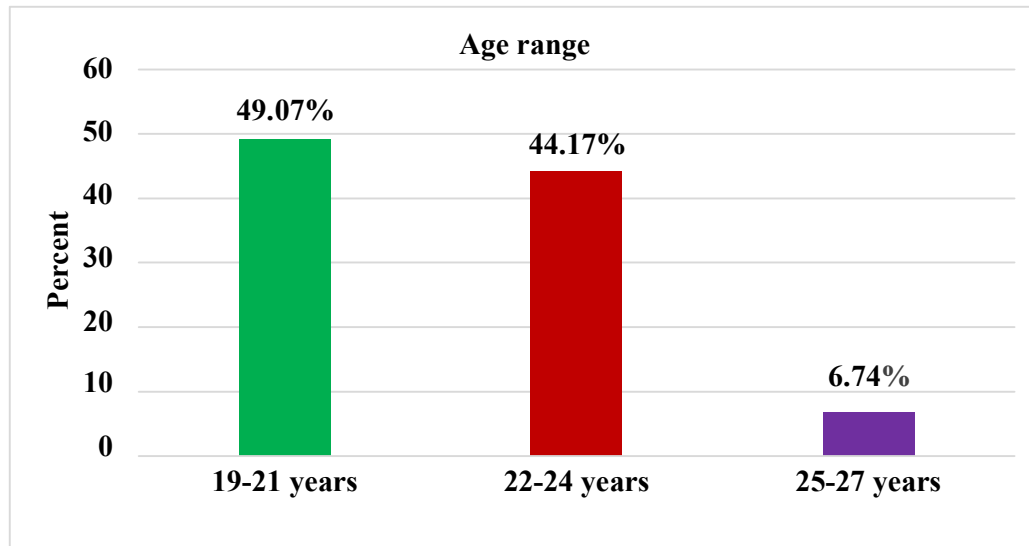


Figure -1: Age range of participants

4.2 Gender of Participants

Among the 163 respondents, 82 were female and 81 were male. The gender distribution is nearly equal, with a slight majority of female participants.

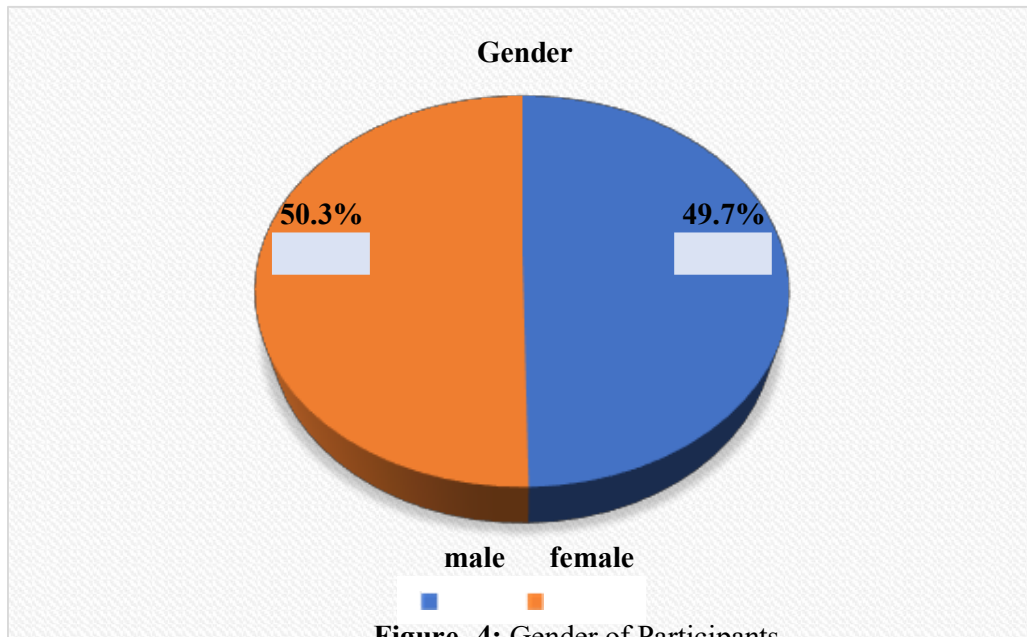


Figure -4: Gender of Participants

4.3 Marital Status of Participants

The majority of participants were single ($n = 154$), while only a small proportion reported being married ($n = 9$).

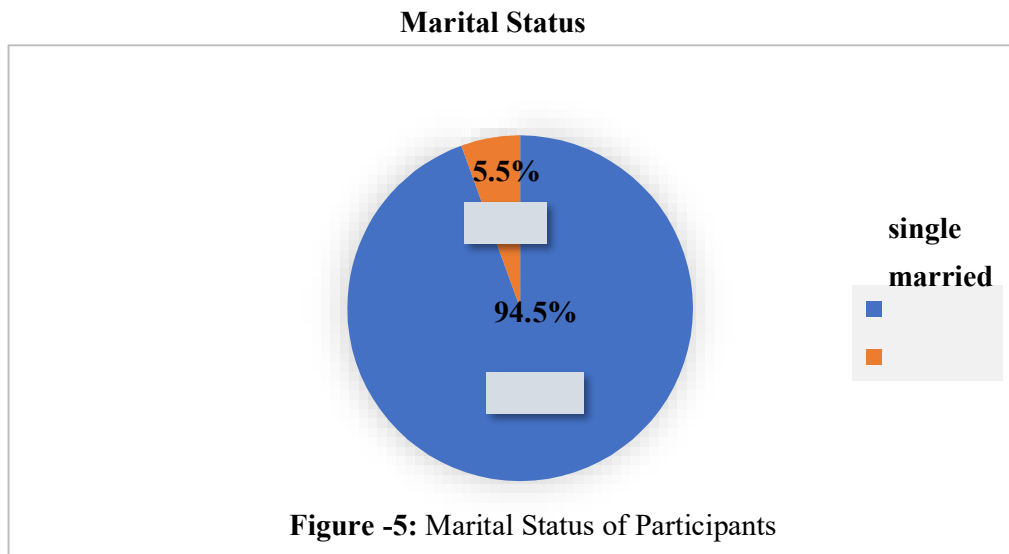
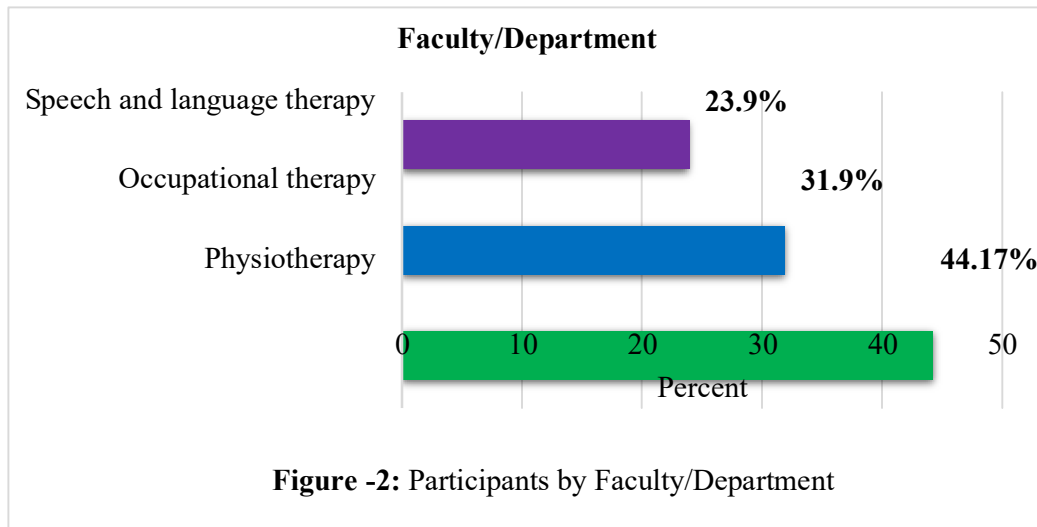


Figure -5: Marital Status of Participants

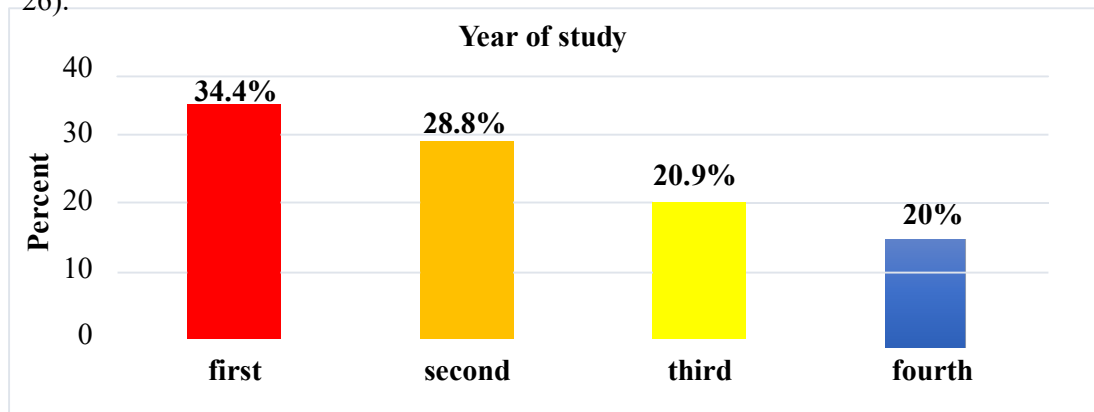
4.4 Distribution of participants by Faculty/Department

According to the data, a total of 163 respondents participated in the survey. Among them, the highest proportion belonged to the Physiotherapy department, accounting for 72 individuals, which represents 44.2% of the total sample. This is followed by Occupational Therapy, with 52 respondents and Speech and Language with 39 respondents.



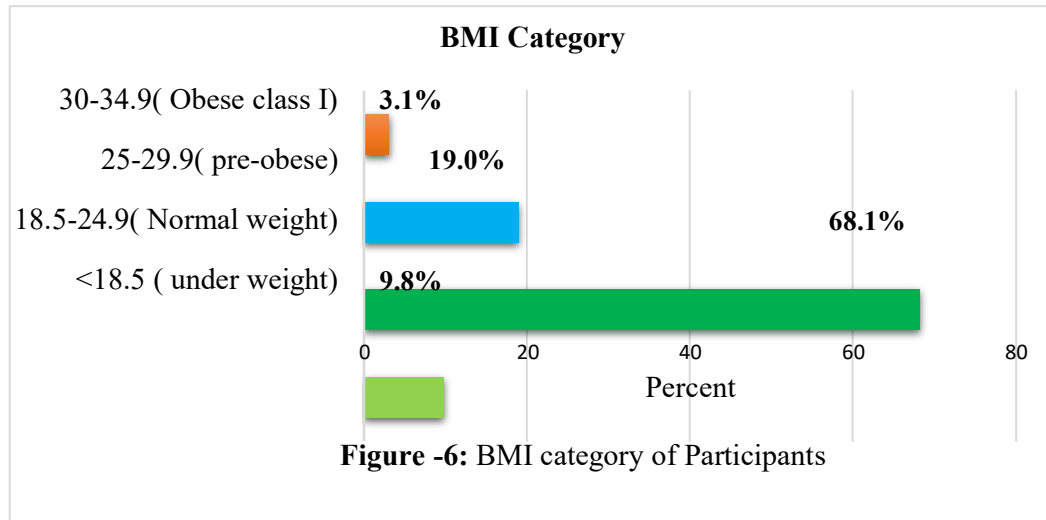
4.5 Distribution of participants by Year of Study

Among the 163 participants, the largest proportion were in their first year (n = 56), followed by those in the second year (n = 47). Students in the third year accounted for (n = 34) of the sample, while the smallest group consisted of fourth-year students (n = 26).



4.6 Prevalence of participants according to BMI Category

Among the 163 respondents, the majority—111 individuals fell within the normal weight range (BMI 18.5–24.9). This was followed by 31 individuals in the pre-obese category (BMI 25–29.9), and 16 individuals who were underweight (BMI <18.5). A smaller portion, 5 individuals, were classified as Obese Class I (BMI 30–34.9).



4.7 Classification of students according to Physical activity level

Table -2: Physical activity level

Physical activity level	Frequency (N =163)	Percentage %
Low	29	17.8
Moderate	134	82.2
High	0	0
Total	163	100.0

Table -2 shows that Out of 163 respondents, the majority—134 individuals reported a moderate level of physical activity. A smaller portion, 29 individuals indicated a low level of physical activity. Notably, none of the participants reported a high level of physical activity.

4.8 Association between physical activity level and BMI categories of participants:

Table-3: Association between physical activity level and BMI categories of participants:

Dependent variable: physical activity level			
Independent Variables:	Test value	P-value	Significance
BMI categories	40.785	< 0.001	significant

To address this, the Fisher-Freeman-Halton Exact Test was used, as it is better suited for tables with small expected frequencies. The result of this test was statistically significant ($p < .001$), indicating that there is indeed a meaningful association between BMI category and physical activity level. This suggests that individuals in different BMI groups tend to engage in different levels of physical activity, and this pattern is unlikely to be due to chance.

Obesity continues to be a significant global health issue that affects people from all walks of life, regardless of age, culture, or socioeconomic status. While malnutrition-related diseases are still a concern in many developing nations, it is the surge in health problems related to poor lifestyle choices—like being overweight or obese—that has taken center stage in recent years (Popkin, Adair & Ng, 2012). With changing diets, reduced physical activity, and increased sedentary behaviors, university students, especially in urban settings, are not immune to this growing challenge.

The purpose of this study was to examine the relationship between physical activity levels and obesity among undergraduate students at BHPI. The study involved 163 participants, with the majority (93.3%) falling within the 19–24-year age group. This age distribution is consistent with findings from other similar studies, such as one conducted among physiotherapy students in Navi Mumbai (Popat and Shabiethaa, 2023), which also reported a high concentration of students within the 18–25 age range. That similarity in age trends suggests that our sample was generally representative of the typical university-going population.

Interestingly, the gender distribution in our study was nearly balanced—50.3% female and 49.7% male. This balance contributes positively to the reliability of the data when exploring health-related behaviors across genders. When compared to other studies, such as the one involving Sudanese medical students (Yousif, Kaddam & Humeda, 2019), which had a greater female proportion (58%), we can see how gender ratios vary by region and institution, potentially affecting health outcomes and lifestyle patterns. Additionally, a very high percentage of participants (94.5%) were unmarried, which is quite expected in a university setting. Though this factor was not a major focus of the study, it aligns with the demographic characteristics of undergraduate student populations in general.

When examining academic background, the majority of participants were from the Physiotherapy department (44.2%), followed by Occupational Therapy (31.9%) and Speech and Language Therapy (23.9%). The sample also reflected a fair mix of academic years, with the highest participation from first-year students (34.4%) and gradually fewer from higher levels. This distribution may suggest that newer students

are more likely to participate in research, or it could simply reflect enrollment sizes at different stages.

As for the BMI data, most of the students (68.1%) fell within the normal weight range. However, 19.0% were in the pre-obesity range, 9.8% were underweight, and a small fraction (3.1%) were classified as Obese Class I. Compared to other South Asian student groups, where the combined rate of overweight and obesity often exceeds 25%, the BMI profile of BHPI students appears somewhat healthier. For example, Yousif et al. (2019) reported a lower normal-BMI rate of 58.3% among Sudanese students, and Popat and Shabiethaa (2023) observed significantly higher obesity levels in Navi Mumbai. These findings suggest that BMI status varies across regions, possibly due to differences in cultural food habits, lifestyle routines, or institutional environments.

In terms of physical activity, 82.2% of participants reported having a moderate level of activity, while 17.8% had low activity levels. Notably, none of the students reported high physical activity. This absence is concerning. While moderate activity is better than none, the complete lack of high-intensity physical engagement suggests a lack of vigorous or structured exercise in student routines. When compared to the Navi Mumbai study, where 29% of students reported high activity, and the Sudanese study with 23.1% high activity, the BHPI students seem less engaged in more intense physical efforts. This could point to several issues, including a lack of motivation, time constraints, or limited access to recreational facilities.

The statistical analysis confirmed a significant association ($p < 0.001$) between BMI category and physical activity level. In simple terms, students who were overweight or obese were more likely to report lower levels of physical activity. This finding is consistent with previous studies and reinforces the idea that low physical activity may not just be a result of being overweight—it can also be a contributing factor. In some cases, students may avoid exercise due to body image concerns or physical discomfort, which only deepens the cycle of inactivity and weight gain.

It's also worth noting that this study was conducted during an academic semester, a time when students are typically under pressure from coursework, exams, and clinical placements. These responsibilities might limit the time and energy they can devote to exercise. Moreover, habits like long hours spent sitting in lectures or studying at home

contribute to a sedentary lifestyle, which can quietly but significantly impact health.

Lastly, cultural and institutional factors may also play a role. For instance, while students from health-related fields like Physiotherapy or Occupational Therapy may understand the importance of physical activity in theory, that knowledge doesn't always translate into action. This gap between knowledge and practice could be due to lack of structured opportunities, or simply the challenge of balancing academics with personal well-being.

5.1 Limitations

This study encountered several limitations that should be considered when interpreting the results. Firstly, the research was conducted within a restricted time frame due to the structure of the undergraduate academic calendar. This constraint limited the depth of exploration, as well as the inclusion of potentially influential variables. With a longer duration, it would have been possible to gather more comprehensive data and refine the analysis further.

Secondly, the study sample consisted solely of students from a single institution BHPI (Bangladesh Health Professions Institute). While this provided valuable insight into a specific group, it naturally restricts the generalizability of the findings. Students from different institutions, regions, or educational backgrounds might display different patterns in terms of BMI and physical activity, so the results should be interpreted within this narrow context.

Moreover, the sample size 163 participants while sufficient for initial analysis, may still fall short in terms of statistical power for detecting subtler trends or subgroup differences. A larger and more diverse sample would strengthen the study's external validity and offer broader insights into the relationship between BMI and physical activity levels.

Another important limitation relates to research experience. As this was the researcher's first formal academic study, conducted at the undergraduate level, there were natural limitations in terms of familiarity with advanced data handling and interpretation techniques. Although every effort was made to ensure objectivity and precision, minor errors in data collection, entry, or analysis cannot be ruled out.

Finally, the lack of existing research on this specific topic in the context of Bangladesh posed challenges during literature review and comparison. While international studies offered some guidance, differences in cultural, environmental, and academic settings reduce the direct applicability of such comparisons.

6.1 Conclusion

This study was conducted to investigate the association between physical activity levels and obesity among undergraduate students at the Bangladesh Health Professions Institute (BHPI), under the Centre for the Rehabilitation of the Paralyzed (CRP), Savar. The majority of the participants were between 19 and 24 years old, with an almost equal distribution of male (49.7%) and female (50.3%) students. Most participants were single and studying in the Physiotherapy, Occupational Therapy, or Speech and Language Therapy departments, primarily in their first and second academic years. A significant portion of the respondents (68.1%) fell within the normal BMI range, while 19% were pre-obese, 9.8% underweight, and 3.1% classified as Obese Class I. Despite this relatively healthier weight profile compared to other South Asian cohorts, the findings revealed a concerning absence of high-level physical activity among all students. While 82.2% engaged in moderate physical activity, 17.8% reported low activity levels, highlighting a gap in vigorous or structured exercise routines. The results showed a statistically significant association ($p < 0.001$) between BMI categories and physical activity levels, indicating that overweight and obese students were more likely to engage in lower levels of physical activity. These findings suggest that physical inactivity is not only more prevalent among those with higher BMI but may also contribute to or exacerbate weight-related health risks. Furthermore, although the majority of students had some level of physical activity, the lack of intensity and frequency may not be sufficient to meet established health standards. This pattern underscores the importance of promoting more structured, vigorous physical activity, especially within academic environments. Overall, this study emphasizes that even among a population with generally healthy BMI levels, inadequate physical activity remains a key concern, particularly for overweight individuals. Targeted lifestyle interventions, awareness programs, and institutional support are essential for fostering healthier habits, preventing obesity, and reducing long-term health risks associated with sedentary behavior.

6.2 Recommendation

The aim of this study was to assess the relationship between physical activity levels and obesity among undergraduate students at BHPI. Due to academic and time limitations, data were collected from a single institution, which limits the generalizability of the findings to the wider student population in Bangladesh. Therefore, for future studies, it is recommended that a larger and more diverse sample be taken from multiple institutions and regions to provide a broader understanding of the issue.

Further research could use stratified sampling techniques to assess the risk factors associated with obesity and low levels of physical activity. A comparative study may also be carried out between students of different academic backgrounds or regions to determine variations in obesity prevalence and physical activity patterns. Longitudinal studies are also encouraged to evaluate how lifestyle behaviors change over time during university life. Such research would help in forming effective strategies to promote healthier lifestyles among students across Bangladesh.

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Appendix 1: IRB Application and Approval from BHPI



বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/12/2024/1038

Date: 15/12/2024

To
Mottakin Mahmud Yasin
4th Year B.Sc. in Physiotherapy
Session: 2019-20 Student ID: 112190477

Subject: Approval of the thesis proposal "Prevalence of obesity and its association with physical activity among undergraduate students in BHPI: a cross-sectional study" by the ethics committee.

Dear Mottakin Mahmud Yasin,
Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the dissertation as mentioned earlier with you as the principal investigator and Nadia Afrin Urme, Lecturer, Department of Physiotherapy, BHPI, as the thesis supervisor. The following documents have been reviewed and approved:

Sl. No.	Name of the Documents
1	Research Proposal
2	Questionnaire (English version)
3	Information sheet & consent form.

The study aims to determine the levels of physical activity and prevalence of obesity among undergraduate students in BHPI. The study involves the use of a BMI and IPAQ-SF Questionnaire to identify obesity and levels of physical activity among undergraduate students in BHPI. It may take 8 to 10 minutes to answer the questionnaire, any instruction or precaution for collection of specimen and there is no likelihood of any harm to the participants and participation in the study may benefit the participants or other stakeholders. Students benefit from answering the IPAQ-SF and calculating their BMI by gaining insights into their physical activity, health risks, and overall well-being, allowing them to set fitness goals, improve mental health, and make informed lifestyle choices. Data collectors will receive informed consent from all participants any data collected will be kept confidential. The members of the Ethics Committee have approved the study to be conducted in the presented form at the meeting held at 9 AM on 15 July 2024 at BHPI (44th IRB Meeting).

The institutional Ethics Committee expects to be informed about the study's progress, any changes occurring in the course of the study, any revision in the protocol, and patient information or informed consent, and it is asked to be provided a copy of the final report. This Ethics committee is working under the Nuremberg Code 1947, the World Medical Association Declaration of Helsinki, 1964 - 2013, and other applicable regulations.

Best regards,

Muhammad Millat Hossain
Associate Professor & Course Coordinator, MRS
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

পিন্ডারপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ। ফোন: +৮৮ ০২ ২২৪৪৪৫৪৬৪-৫, +৮৮ ০২ ২২৪৪৪১৪০৪, মোবাইল: +৮৮ ০১৭৩০ ০৫৯৬৪৭
CRP-Chapain, Savar, Dhaka-1343, Bangladesh. Tel: +88 02 224445464-5, +88 02 224441404, Mobile: +88 01730059647
E-mail: principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd

Appendix 2: Data collection Permission

Permission Letter

Date: 26/12/24

Head
Department of Physiotherapy
Bangladesh Health Professions Institute
CRP, Savar, Dhaka

Subject: Prayer for seeking permission to collect data for conducting research project.

Sir,

With due respect and humble submission to state that I am Mottakin Mahmud Yasin, a student of 4th year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: "Prevalence of obesity and its association with physical activity among Undergraduate students in BHPI: A Cross-Sectional Study" under the supervision of Nadia Afrin Urme, Lecturer, Department of Physiotherapy, BHPI. I want to collect data for my research project from BHPI. So, I need permission for data collection at BHPI, Savar, Dhaka-1343. I would like to assure that anything of the study will not be harmful for the participants and the Department itself.

I, therefore pray and hope that you would be kind enough to grant my application and give me permission for data collection and oblige thereby.

Yours faithfully,

Mottakin Mahmud Yasin
4th Year B.Sc. in Physiotherapy
Class Roll: 31; Session: 2019-20
Bangladesh Health Professions Institute (BHPI)
(An academic Institution of CRP)
CRP- Chapain, Savar, Dhaka-1343.

Forwarded,
ledz
31/12/2024

Forwarded and
Recommended
Sudu

Dr. Shazal Kumar Das, PhD
Assistant Professor and Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka-1343.

Appendix 3: Information and Consent Form

Information sheet (English)

Research study title: Prevalence of obesity and its association with physical activity among undergraduate students in BHPI: a cross-sectional study.

Objective of the study:

1. To explore the socio-demographic state of undergraduate students in BHPI.
2. To know the obesity prevalence among undergraduate students at BHPI.
3. To determine the levels of physical activity among undergraduate students in BHPI.
4. To determine association of obesity and physical activities.

Participants of the study: Students at BHPI continue their studies.

Data collection procedure: If you participate in this study, you will be asked to some personal and other related information regarding physical activity by using a questionnaire. This will take approximately 8-10 minutes of your time.

Benefits of participations: Participants will have the opportunity to reflect on, share and more aware of their thoughts and feelings about obesity and physical activities. Additionally, your participation and better statements are likely to help us find the answer to the research questions and in future study it may benefitted to the researcher.

Risks of participations: We do not foresee any risk or discomfort from your participation in the study.

Economic benefits: You will not be given any money or gifts to take part in this research.

Confidentiality: All information provided by you will be treated as confidential it will ensure that the source of information remains secret. Also, your name will not appear anywhere and no one except me will know about your specific answers.

Voluntary participation: Yours participation in this study is voluntary, so you may choose to participate or not. Your decision will not to volunteer will not influence the treatment you may be receiving either now or in the future. If you do not wish to continue, you have the right to withdraw from the study, without penalty, at any time.

Who to contact: If you have any query, you may ask me now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following:

Researcher:

Mottakin Mahmud Yasin

4th Professional B.Sc. in Physiotherapy

Bangladesh Health Professions Institute (BHPI)

Contact no: 01971-969054

E-mail: yasinmottakin@gmail.com

Or,

My research supervisor:

Nadia Afrin Urme

Lecturer, Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka- 1343.

E-mail: afinnadia4127@yahoo.com

Consent certificate

A) Participant or witness:

1. Did you understand the information sheet?

Yes

No

2. Do you have anything else to know?

Yes

No

(If yes,)

3. Do you understand that you will not benefit financially from this research?

Yes

No

4. Are you allowed to ask questions?

Yes

No

5. Do you consent to your information being recorded?

Yes

No

6. Have you got enough time to decide?

Yes

No

7. Are you consenting to participate in this study?

Yes

No

Name of Participant _____

Signature of Participant _____ Date _____

If participant is Illiterate

Name of literate witness _____

Thumb print of participant



Signature of literate witness _____ Date _____

B) Researcher:

I explained the above study precisely to the participant and she indicated his willingness to participate in the study.

Name of Researcher _____

Signature of Researcher _____ Date _____

Questionnaire

Date:

Student's name:

Student ID No:

Address:

Mobile No:

Part- I: Socio-demographic Information:

Questions	Response
1. Age Years
2. Which year are you now in?	<input type="checkbox"/> First Year <input type="checkbox"/> Second Year <input type="checkbox"/> Third Year <input type="checkbox"/> Fourth Year or higher
3. Faculty/Department:	<input type="checkbox"/> Physiotherapy <input type="checkbox"/> Occupational therapy <input type="checkbox"/> Speech and language therapy
4. Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
5. Marital status	<input type="checkbox"/> Single <input type="checkbox"/> Married

Part II: Obesity Measurement:

Question	Response
6. Weight in kg	_____ kg
7. Height in meter	_____ m
8. Body mass index (BMI)	<input type="checkbox"/> Underweight (< 18.5) <input type="checkbox"/> Normal weight (18.5 to 24.9) <input type="checkbox"/> pre-obese (25.0 to 29.9) <input type="checkbox"/> Obese class I (30.0 to 34.9) <input type="checkbox"/> Obese class II (35.0 to 39.9) <input type="checkbox"/> Obese class III (\geq 40.0)

Part III: International Physical Activity Questionnaire (IPAQ)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

Question	Response
9. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics or fast bicycling?	days per week <input type="checkbox"/> No vigorous physical activities
10. How much time did you usually spend doing vigorous physical activities on one of those days?	hours per day _____ minutes per day <input type="checkbox"/> Don't know/Not sure
11. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace or double tennis?	days per week <input type="checkbox"/> No moderate physical activities
12. How much time did you usually spend doing moderate physical activities on one of those days?	hours per day _____ minutes per day <input type="checkbox"/> Don't know/Not sure
13. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?	_____ days per week <input type="checkbox"/> No walking
14. How much time did you usually spend walking on one of those days?	hours per day _____ minutes per day <input type="checkbox"/> Don't know/Not sure
15. During the last 7 days, how much time did you spend sitting on a weekday?	hours per day _____ minutes per day <input type="checkbox"/> Don't know/Not sure

তথ্য শীট (বাংলা)

গবেষণা শিরোনাম: বিএইচপিআই-তে স্নাতক শিক্ষার্থীদের মধ্যে স্কুলতার প্রাদুর্ভাব এবং শারীরিক কার্যকলাপের সাথে এর সম্পর্ক: একটি ক্রস-সেকশনাল স্টাডি।

গবেষণার উদ্দেশ্য:

- বিএইচপিআই-এর স্নাতক শিক্ষার্থীদের সামাজিক-জনসংখ্যাভিত্তিক অবস্থার অনুসন্ধান করা।
- বিএইচপিআই-এর স্নাতক শিক্ষার্থীদের মধ্যে স্কুলতার প্রাদুর্ভাব নির্ধারণ করা।
- বিএইচপিআই-এর স্নাতক শিক্ষার্থীদের মধ্যে শারীরিক কার্যকলাপের মাত্রা নির্ধারণ করা।
- স্কুলতা এবং শারীরিক কার্যকলাপের মধ্যে সম্পর্ক নির্ধারণ করা।

গবেষণার অংশগ্রহণকারীরা: বিএইচপিআই-এর স্নাতক শিক্ষার্থীরা।

তথ্য সংগ্রহ পদ্ধতি:

এই গবেষণায় অংশগ্রহণ করলে আপনাকে কিছু ব্যক্তিগত এবং শারীরিক কার্যকলাপ সম্পর্কিত তথ্য জিজ্ঞাসা করা হবে, যা একটি প্রশ্নপত্রের মাধ্যমে প্রায় ৮-১০ মিনিট সময় নেবে।

অংশগ্রহণের সুবিধা:

অংশগ্রহণকারীরা স্কুলতা এবং শারীরিক কার্যকলাপ সম্পর্কে তাদের চিন্তাভাবনা এবং অনুভূতি সম্পর্কে আরো সচেতন হবেন এবং এতে গবেষণার উত্তর খুঁজে পেতে সাহায্য করবে।

অংশগ্রহণের ঝুঁকি:

এই গবেষণায় অংশগ্রহণের কারণে আমরা কোনো ঝুঁকি বা অস্বস্তি আশা করি না।

অর্থনৈতিক সুবিধা:

এই গবেষণায় অংশগ্রহণের জন্য আপনাকে কোনো অর্থ বা উপহার দেওয়া হবে না।

গোপনীয়তা:

আপনার দেওয়া সমস্ত তথ্য গোপনীয় থাকবে এবং তা নিশ্চিত করা হবে যে তথ্যের উৎস গোপন থাকবে। আপনার নাম কোথাও প্রকাশিত হবে না এবং শুধুমাত্র গবেষক আপনার নির্দিষ্ট উত্তরগুলি জানবেন।

স্বেচ্ছায় অংশগ্রহণ:

এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছায়, তাই আপনি অংশগ্রহণ করতে বা না করতে পারেন। আপনার সিদ্ধান্ত বর্তমান বা ভবিষ্যতে আপনার চিকিৎসা প্রভাবিত করবে না। আপনি যদি অব্যাহত রাখতে না চান, তবে আপনি যে কোনো সময় বিনা দণ্ডে গবেষণা থেকে প্রত্যাহার করতে পারেন।

যোগাযোগ:

আপনার কোনো প্রশ্ন থাকলে আপনি এখন বা পরে, এমনকি গবেষণা শুরু হওয়ার পরেও জিজ্ঞাসা করতে পারেন। আপনি যদি পরবর্তীতে প্রশ্ন করতে চান, তাহলে নিম্নলিখিত ব্যক্তিদের সাথে যোগাযোগ করতে পারেন:

গবেষক:

মুত্তাকিন মাহমুদ ইয়াসিন

চতুর্থ পেশাদার বি.এসসি ইন ফিজিওথেরাপি

বাংলাদেশ হেলথ প্রফেশন ইনস্টিটিউট (BHPI)

যোগাযোগ নম্বর: ০১৯৭১-৯৬৯০৫৪

ইমেল: yasinmottakin@gmail.com

গবেষণা সুপারভাইজার:

নাদিয়া আফরিন উর্মি

লেকচারার, ফিজিওথেরাপি বিভাগ

বাংলাদেশ হেলথ প্রফেশন ইনস্টিটিউট (BHPI), সিআরপি, সাভার, ঢাকা- ১৩৪৩

ইমেল: afrinnadia4127@yahoo.com

সম্মতি সনদ:

ক) অংশগ্রহণকারী বা সাক্ষী:

১. আপনি কি তথ্য শীটটি বুঝতে পেরেছেন?

হ্যাঁ

না

২. আপনার কি কিছু জানতে হবে?

হ্যাঁ

না

- যদি হ্যাঁ হয়,

৩. আপনি কি বুঝতে পেরেছেন যে আপনি এই গবেষণা থেকে আর্থিকভাবে উপকৃত হবেন না?

হ্যাঁ

না

৪. আপনি কি প্রশ্ন জিজ্ঞাসা করার অনুমতি দিচ্ছেন?

হ্যাঁ

না

৫. আপনি কি আপনার তথ্য রেকর্ড করতে সম্মতি দিচ্ছেন?

হ্যাঁ

না

৬. আপনি কি সিদ্ধান্ত নেওয়ার জন্য পর্যাপ্ত সময় পেয়েছেন?

হ্যাঁ

না

৭. আপনি কি এই গবেষণায় অংশগ্রহণ করতে সম্মত?

হ্যাঁ

না

অংশগ্রহণকারীর নাম :

অংশগ্রহণকারীর স্বাক্ষর :

তারিখ :

অশিক্ষিত অংশগ্রহণকারী হলে:

সাক্ষী নাম (শিক্ষিত) :

অংশগ্রহণকারীর টিপসই :

সাক্ষীর স্বাক্ষর :

তারিখ :

খ) গবেষক:

আমি উপরোক্ত গবেষণাটি অংশগ্রহণকারীর কাছে ব্যাখ্যা করেছি এবং তিনি গবেষণায় অংশগ্রহণের জন্য সম্মতি প্রকাশ করেছেন।

গবেষকের নাম :

গবেষকের স্বাক্ষর :

তারিখ :

প্রশ্নাবলী (বাংলা সংস্করণ)

তারিখ:

শিক্ষার্থীর নাম:

ঠিকানা:

শিক্ষার্থী আইডি নম্বর:

মোবাইল নম্বর:

পর্ব-১: সামাজিক-জনসংখ্যাতাত্ত্বিক তথ্য:

প্রশ্ন	উত্তর
১. বয়স বছর
২. আপনি এখন কোন বর্ষে?	<input type="checkbox"/> প্রথম বর্ষ <input type="checkbox"/> দ্বিতীয় বর্ষ <input type="checkbox"/> তৃতীয় বর্ষ <input type="checkbox"/> চতুর্থ বর্ষ বা এর উপরে
৩. শিক্ষা শাখা/বিভাগ:	<input type="checkbox"/> ফিজিওথেরাপি <input type="checkbox"/> অকুপেশনাল থেরাপি <input type="checkbox"/> স্পিচ অ্যান্ড ল্যাঙ্গুয়েজ থেরাপি <input type="checkbox"/> প্রস্টেটিকস অ্যান্ড অর্থোটিকস
৪. লিঙ্গ:	<input type="checkbox"/> পুরুষ <input type="checkbox"/> মহিলা
৫. বৈবাহিক অবস্থা:	<input type="checkbox"/> অবিবাহিত <input type="checkbox"/> বিবাহিত

পর্ব-২: স্থলতার পরিমাপ:

৬. ওজন কেজিতে:	_____ কেজি
৭. উচ্চতা মিটারে:	_____ মিটার/ _____ ফিট
৮. বডি মাস ইনডেক্স (BMI):	<input type="checkbox"/> অপুষ্ট (১৮.৫ এর নিচে) <input type="checkbox"/> স্বাভাবিক ওজন (১৮.৫ থেকে ২৪.৯) <input type="checkbox"/> প্রি-ওবেস (২৫.০ থেকে ২৯.৯) <input type="checkbox"/> ওবেস ক্লাস - I (৩০.০ থেকে ৩৪.৯) <input type="checkbox"/> ওবেস ক্লাস - II (৩৫.০ থেকে ৩৯.৯) <input type="checkbox"/> ওবেস ক্লাস - III (≥ 40.0)

পর্ব-৩: আন্তর্জাতিক শারীরিক কার্যকলাপ প্রশ্নাবলী :

আমরা মানুষের দৈনন্দিন জীবনের অংশ হিসাবে করা শারীরিক কার্যকলাপ সম্পর্কে জানতে আগ্রহী। প্রশ্নগুলি গত ৭ দিনে আপনি কতটুকু শারীরিকভাবে সক্রিয় ছিলেন তা সম্পর্কে জানতে চাইবে। দয়া করে প্রতিটি প্রশ্নের উত্তর দিন, এমনকি যদি আপনি নিজেকে সক্রিয় ব্যক্তি মনে না করেন। কাজ, বাড়ির কাজ এবং অবসর সময়ে করা ক্রিয়াকলাপগুলি মনে রাখুন।

প্রশ্ন	উত্তর
৯. গত ৭ দিনে আপনি কত দিন ভারী শারীরিক কার্যকলাপ করেছেন (যেমন: ভারী ওজন তোলা, খনন, অ্যারোবিকস বা দ্রুত সাইকেল চালানো)?	<input type="checkbox"/> _____ দিন প্রতি সপ্তাহে <input type="checkbox"/> কোন ভারী শারীরিক কার্যকলাপ নেই
১০. সাধারণত আপনি কত সময় এই ধরনের ভারী শারীরিক কার্যকলাপ করেন?	<input type="checkbox"/> _____ ঘণ্টা প্রতি দিন <input type="checkbox"/> _____ মিনিট প্রতি দিন <input type="checkbox"/> জানা নেই/নিশ্চিত না
১১. গত ৭ দিনে আপনি কত দিন মাঝারি শারীরিক কার্যকলাপ করেছেন (যেমন: হালকা ওজন বহন করা, সাধারণ গতি সাইকেল চালানো বা ডবল টেনিস)?	<input type="checkbox"/> _____ দিন প্রতি সপ্তাহে <input type="checkbox"/> কোন মাঝারি শারীরিক কার্যকলাপ নেই
১২. সাধারণত আপনি কত সময় এই ধরনের মাঝারি শারীরিক কার্যকলাপ করেন?	<input type="checkbox"/> _____ ঘণ্টা প্রতি দিন <input type="checkbox"/> _____ মিনিট প্রতি দিন <input type="checkbox"/> জানা নেই/নিশ্চিত না
১৩. গত ৭ দিনে আপনি কত দিন কমপক্ষে ১০ মিনিট হেঁটেছেন?	<input type="checkbox"/> _____ দিন প্রতি সপ্তাহে <input type="checkbox"/> কোন হাঁটা নেই
১৪. সাধারণত আপনি কত সময় হাঁটেন?	<input type="checkbox"/> _____ ঘণ্টা প্রতি দিন <input type="checkbox"/> _____ মিনিট প্রতি দিন <input type="checkbox"/> জানা নেই/নিশ্চিত না
১৫. গত ৭ দিনে আপনি কত সময় বসে কাটিয়েছেন?	<input type="checkbox"/> _____ ঘণ্টা প্রতি দিন <input type="checkbox"/> _____ মিনিট প্রতি দিন <input type="checkbox"/> জানা নেই/নিশ্চিত না