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# Demographic predictors of physical activity barriers among Filipino college students: A logistic regression analysis

# Predictores demográficos de las barreras para la actividad física en estudiantes universitarios filipinos

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**Abstract**
This study investigated the influence of demographic factors on college students' perceived barriers to physical activity participation across seven key domains: lack of time, influence from others, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. Utilizing a cross-sectional design and binary logistic regression analysis, the study surveyed college students to determine which demographic variables significantly predict physical activity constraints. The results revealed that gender identity, academic year level, field of study, and socio-economic status significantly influenced specific barrier domains. Female students were more likely to report psychological and skill-related barriers, while STEM students demonstrated higher odds of perceiving time and resource constraints compared to their HUMSS counterparts. Additionally, senior and middle-income students perceived fewer barriers, reflecting how maturity and economic factors shape physical activity participation. The findings emphasize the need for inclusive, targeted strategies in university settings that address group-specific challenges to promote equitable access to physical activity. These insights offer valuable implications for physical education programs, wellness interventions, and campus health policy design.
**Keywords:** physical activity barriers, demographic predictors, college students, logistic regression, gender differences

**Resumen**
Este estudio investigó la influencia de las características demográficas en las barreras percibidas por los estudiantes universitarios para participar en actividades físicas, abarcando siete dominios clave: falta de tiempo, influencia de otros, falta de energía, falta de fuerza de voluntad, miedo a lesionarse, falta de habilidades y falta de recursos. Utilizando un diseño transversal y un análisis de regresión logística binaria, se encuestó a estudiantes universitarios para determinar qué variables demográficas predicen significativamente las limitaciones para la actividad física. Los resultados revelaron que la identidad de género, el nivel académico, el campo de estudio y el nivel socioeconómico influyeron significativamente en dominios específicos de barreras. Las estudiantes mujeres fueron más propensas a reportar barreras psicológicas y relacionadas con habilidades, mientras que los estudiantes de programas STEM mostraron mayores probabilidades de percibir limitaciones de tiempo y recursos en comparación con sus homólogos de HUMSS. Además, los estudiantes de último año y aquellos con ingresos medios percibieron menos barreras, lo que refleja cómo la madurez y los factores económicos influyen en la participación en la actividad física. Los hallazgos enfatizan la necesidad de estrategias inclusivas y específicas en entornos universitarios que aborden los desafíos propios de cada grupo, para promover un acceso equitativo a la actividad física. Estas conclusiones ofrecen implicaciones valiosas para programas de educación física, intervenciones de bienestar y el diseño de políticas de salud en los campus universitarios.
**Keywords:** barreras para la actividad física, predictores demográficos, estudiantes universitarios, regresión logística, diferencias de género

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## Introduction

Engaging in regular physical activity (PA) is widely recognized as a cornerstone of physical, mental, and social well-being across all stages of life. Gualdi-Russo & Zaccagni (2021) emphasizes that PA reduces the risk of non-communicable diseases, enhances musculoskeletal and cardiorespiratory fitness, and supports cognitive and emotional health. Specifically, among young adults, PA has been shown to improve academic performance, elevate mood, and promote long-term healthy behaviors (Biddle et al., 2021; Rodriguez-Ayllon et al., 2019).

Despite its numerous benefits, physical inactivity (PI) remains a pressing global concern. According to Annear (2022), over 1.4 billion adults globally are physically inactive, with the Asia-Pacific region recording the highest prevalence at 46%. Alarmingly, college students constitute a significant proportion of this inactive population. Transitioning to higher education presents a unique set of challenges, including increased academic demands, changes in social networks, environmental shifts, and decreased access to structured physical activity programs, all of which contribute to lower PA participation (Van Hoomissen & Downs, 2021; Wilson et al., 2021).

A growing body of literature identifies multiple barriers that hinder PA among university students. These barriers span personal (e.g., lack of time, energy, willpower), social (e.g., peer influence), and environmental (e.g., lack of resources or access to facilities) domains (Silva et al., 2022). Tools such as the Barriers to Being Active Quiz (BBAQ) developed by the U.S. Centers for Disease Control and Prevention categorize these into seven domains: time, energy, willpower, skill, resources, fear of injury, and social influence (CDC, n.d.).

While such barriers are well-documented, less is known about how these perceptions vary across different socio-demographic profiles, particularly in developing countries like the Philippines. Research has suggested that factors such as gender, socioeconomic status, academic year, and field of study can significantly influence perceived barriers. For example, females are more likely to cite safety concerns and lack of confidence, while students from low-income backgrounds face limited access to resources (Salmi et al., 2023). Additionally, students enrolled in STEM programs tend to

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report higher time and energy-related constraints due to rigorous coursework compared to those in humanities programs (Carlos et al., 2023).

In the Philippine context, such disparities are exacerbated by infrastructural inequalities and limited public health initiatives focused on college-level PA participation (Puen et al., 2021). Despite ongoing research, there is a notable gap in empirical studies using multivariate analysis to explore how multiple demographic variables interact to predict perceived PA barriers among college students.

Guided by the Ecological Model of Health Behavior (McLeroy et al., 1988), this study recognizes that physical activity participation is influenced by multiple layers of interaction—individual, interpersonal, organizational, community, and policy levels. Demographic factors such as gender, socioeconomic status, and field of study operate across these layers, shaping how students perceive and respond to physical activity barriers. This theoretical lens contextualizes the interplay between personal and environmental determinants, positioning the current study not merely as descriptive but as a contribution to the theoretical understanding of behavioral and structural influences on physical inactivity among Filipino college students.

Therefore, this study aims to examine the extent to which demographic characteristics—specifically gender identity, residence, socioeconomic status, academic year, and field of study—influence college students' perceptions of barriers to physical activity participation. By utilizing logistic regression analysis, the study seeks to generate evidence-based insights to inform inclusive, targeted interventions that promote active lifestyles within higher education institutions.

## Health Benefits of Physical Activity

Physical activity (PA) plays a critical role in enhancing an individual's physical, mental, and social well-being. Shaw et al. (2023) asserts that regular PA reduces the risk of non-communicable diseases, enhances cardiorespiratory fitness, and improves psychological health. Among youth and young adults, PA has been shown to promote cognitive functioning, emotional regulation, and resilience (Rodriguez-Ayllon et al., 2019). These benefits extend to academic performance, particularly among college students who face high stress levels (Biddle et al., 2021).

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However, despite these established benefits, the global prevalence of physical inactivity remains alarmingly high. According to Cromwell (2023), approximately 31% of adults worldwide are physically inactive, with the Asia-Pacific region reaching nearly 46%. This public health concern is even more pronounced in higher education settings, where lifestyle changes and academic demands often lead to sedentary behaviors.

### Barriers to Physical Activity

Several studies have sought to identify the underlying reasons for low participation in PA. The U.S. Centers for Disease Control and Prevention (CDC, n.d.) categorized barriers into seven domains: lack of time, social influence, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. These domains have been validated in diverse populations using the Barriers to Being Active Quiz (BBAQ), a widely used and psychometrically sound instrument (Al-Fahhad et al., 2024).

Empirical studies show that lack of time and lack of energy are the most frequently cited barriers among college students, especially those engaged in demanding academic programs (Liu & Endozo, 2025). Lack of willpower and social support also significantly affect participation, particularly among students managing multiple responsibilities or experiencing social anxiety (Jones et al., 2021).

### Demographic Predictors of Perceived Barriers

Several demographic factors have been associated with varying perceptions of PA barriers. Gender is among the most consistent predictors. Female students are more likely to report concerns about safety, lack of skills, and lower confidence in physical competence compared to their male counterparts. Furthermore, students identifying as LGBTQIA+ often face heightened social stigma or lack of inclusivity in sports and activity spaces (Cruz et al., 2023).

Socioeconomic status (SES) is another crucial determinant. Students from lower-income backgrounds tend to experience more pronounced barriers due to limited financial resources, lack of access to facilities, and competing responsibilities such as part-time work (Arazi et al., 2022). Likewise, students residing in rural areas may benefit from

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outdoor spaces but lack institutional resources such as gyms and wellness programs (Delfa-de-la-Morena et al., 2022).

Year level and academic specialization also play significant roles. Freshmen often report higher time and energy barriers due to adjustment challenges, whereas seniors typically develop better time management. Additionally, students enrolled in STEM-related courses consistently experience more academic stress and cite greater PA barriers than those in Humanities and Social Sciences (HUMSS) (Delfa-de-la-Morena et al., 2022).

### Research Gaps and the Philippine Context

While several global studies have examined PA barriers, research focusing on Filipino college students remains limited. The few existing local studies suggest similar trends but also highlight culturally specific issues such as unsafe neighborhood environments, weather unpredictability, and institutional neglect of physical education promotion (Puen et al., 2021). Moreover, existing literature often examines barriers in isolation, without exploring how multiple demographic variables interact to influence perceptions of PA barriers.

Thus, there is a need for multivariate statistical approaches, such as logistic regression, to comprehensively understand how demographic profiles collectively shape perceived barriers among college students in the Philippines.

## Methods

### *Research Design*

This study employs a cross-sectional research design, which is widely used to gather data from a specific population at a single point in time. Such a design is particularly effective for determining the prevalence of certain attributes, identifying relationships between variables, and comparing subgroups within a population. In this research, the design is appropriate for assessing college students' demographic profiles, their perceived barriers to physical activity (PA), and the associations between these variables using both descriptive and inferential analyses, including logistic regression.

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Cross-sectional designs are also commonly applied in related studies exploring physical activity behaviors and barriers. For instance, a cross-sectional approach to investigate the relationships between perceived barriers and domain-specific PA and sedentary behavior among adults. Similarly, this design examine how perceived PA barriers are associated with depression symptoms among low-active community-dwelling women.

Given its ability to capture a comprehensive snapshot of variables of interest, the cross-sectional design enables this study to offer valuable insights into the diverse factors influencing PA participation among college students. Furthermore, its non-experimental and observational nature is well-suited to the educational setting and ethical constraints of working with student populations.

### *Participants, Sampling Technique, and Sample Size*

The participants of this study consisted of 531 college students currently enrolled in selected state universities located in both rural and urban areas in the Philippines. These institutions were purposively chosen due to their large and diverse student populations, ensuring representation across various sociodemographic backgrounds.

A non-probability convenience sampling technique was employed to recruit participants. This approach was deemed appropriate due to accessibility constraints and the need for timely data collection. Convenience sampling is commonly utilized in cross-sectional studies within educational and health contexts, particularly when the target population is heterogeneous and geographically dispersed.

While convenience sampling inherently limits the generalizability of findings, efforts were made to enhance representativeness by including participants from multiple state universities located in both urban and rural settings and across different academic disciplines. This strategy ensured demographic diversity and mitigated potential sampling bias. Moreover, non-probabilistic approaches are acceptable and frequently adopted in educational and health behavior research where random selection is logistically challenging (Creswell & Creswell, 2018). The study also adhered to the minimum sample size requirement for logistic regression, following the 10:1 ratio of participants to

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predictors, which supports adequate statistical power and validity of parameter estimates (Peduzzi et al., 1996).

The inclusion criteria were as follows: students must be (1) enrolled in an undergraduate program during the academic year when the study was conducted, and (2) willing to provide informed consent prior to participation. Students from any year level, academic discipline, or gender identity were eligible. No exclusion was applied based on physical activity level or prior exposure to physical education coursework.

The final sample included respondents from diverse demographic subgroups, such as gender identity (male, female, LGBTQIA+, prefer not to say), residential setting (rural or urban), socio-economic status (low or middle income), academic year (freshman to senior), and field of study (STEM, HUMSS, or other programs). This diversity allowed for a comprehensive analysis of how these variables influence perceptions of barriers to physical activity.

The sample size of 531 is considered sufficient for conducting multivariate statistical procedures such as logistic regression, which requires large samples to ensure statistical power and reliable estimations (Cohen et al., 1979; Katsaounis, 2004). The distribution of participants across demographic categories also supported subgroup comparisons using t-tests and ANOVA.

### *Instruments*

To collect the data necessary for this study, a structured online survey questionnaire was utilized. The instrument comprised three major sections: (1) participant information and consent form, (2) sociodemographic profile, and (3) a standardized tool for measuring perceived barriers to physical activity.

The first section included an informed consent form and a brief description of the study's objectives, ensuring voluntary participation and confidentiality in accordance with ethical research practices. Participants were informed that their responses would be kept anonymous and used solely for academic purposes.

The second section gathered the demographic profile of the respondents. Items included gender identity (male, female, LGBTQIA+, prefer not to say), type of residential area (urban or rural), socio-economic status (low or middle income), academic year

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(freshman to senior), and academic specialization (STEM, HUMSS, or others). This section was essential for determining the relationship between these variables and students' perceived barriers to physical activity.

The third section measured perceived barriers using the Barriers to Being Active Quiz (BBAQ) developed by the U.S. Centers for Disease Control and Prevention (CDC, n.d.). The BBAQ is a standardized 21-item instrument that evaluates seven key domains of perceived physical activity barriers:

- Lack of Time (LT)
- Social Influence (SI)
- Lack of Energy (LE)
- Lack of Willpower (LW)
- Fear of Injury (FI)
- Lack of Skill (LS)
- Lack of Resources (LR)

Each domain consists of three items, rated on a 4-point Likert scale: 0 (Very unlikely), 1 (Somewhat unlikely), 2 (Somewhat likely), and 3 (Very likely). A score of 5 or more in any domain indicates that the respondent considers it a significant barrier to physical activity participation.

The BBAQ has demonstrated strong psychometric properties across diverse populations. Al-Fahhad et al. (2024) reported good internal consistency (Cronbach's α ranging from 0.812 to 0.844) and moderate to high test-retest reliability (Intraclass Correlation Coefficients ranging from 0.46 to 0.87). Factor analyses support its validity in capturing distinct categories of PA barriers.

To further establish the local validity and reliability of the instrument, a pilot test was conducted among 30 college students with comparable demographic characteristics who were not included in the main study. The pilot yielded a Cronbach's alpha coefficient of 0.84, indicating high internal consistency. Additionally, three experts in physical education and behavioral science reviewed the questionnaire to ensure content validity, clarity of wording, and cultural appropriateness for Filipino college students. These steps strengthened the tool's psychometric soundness and contextual relevance prior to full-scale data collection.

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The instrument was administered via Google Forms, allowing for cost-effective and efficient data collection. Response settings were configured to prevent duplicate submissions and ensure data integrity. The tool was adapted without modification to its content, as it is a publicly available resource intended for non-commercial research and educational use.

### *Data Analysis*

The data collected through the online survey were organized and processed using Microsoft Excel for initial data handling and cleaned prior to statistical treatment. The analysis was conducted using Jamovi statistical software (version 2.3), employing both descriptive and inferential statistical techniques to address the research objectives effectively.

To describe the demographic characteristics of the participants, the study utilized descriptive statistics, including frequencies and percentages for categorical variables such as gender identity, type of residence, socio-economic status, academic year, and field of study. Additionally, mean scores were computed for each of the seven barrier domains in the Barriers to Being Active Quiz (BBAQ) to determine which domains were most commonly perceived as significant barriers to physical activity participation among the respondents. This descriptive approach aligns with previous research exploring patterns of physical inactivity and its determinants among university students (Puen et al., 2021).

To determine the predictive relationship between demographic variables and each perceived barrier domain, the study employed binary logistic regression analysis. Each barrier domain was treated as a binary dependent variable (significant vs. not significant), with demographic variables entered as independent predictors. This multivariate method allowed for the estimation of odds ratios (ORs), offering insight into the strength and direction of associations. The model fit and predictive accuracy were assessed using indicators such as the likelihood ratio test, Cox & Snell $R^2$, Nagelkerke $R^2$, classification accuracy, sensitivity, and specificity. This approach is supported by methodological literature and similar studies in physical activity research that utilize logistic regression to evaluate the effects of multiple demographic predictors.

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Although the Barriers to Being Active Quiz (BBAQ) employed Likert-type response scales, each domain score was dichotomized according to the official CDC scoring protocol, where a total of five or more points indicates a significant barrier to physical activity participation. This procedure aligns with previous behavioral studies that used the BBAQ as a categorical outcome variable to identify predictors of barrier presence or absence (Al-Fahhad et al., 2024; Arazi et al., 2022). While dichotomization may reduce the variability of responses, it remains methodologically appropriate for logistic regression modeling, as it allows for clear interpretation of the likelihood of experiencing a barrier based on demographic characteristics.

Across all tests, results with p-values less than 0.05 were considered statistically significant, ensuring that conclusions drawn from the findings are both robust and meaningful.

### *Ethical Statement*

Ethical This study strictly adhered to ethical principles in conducting research involving human participants. Prior to the data collection, the researchers obtained formal approval from the appropriate academic research ethics committee of the involved institution. All participants were informed of the study's purpose, procedures, and their rights as respondents through an introductory information sheet embedded in the online survey form.

Participation in the study was entirely voluntary, and respondents were assured that they could withdraw at any time without penalty or consequence. Informed consent was obtained electronically from all participants before they proceeded to answer the questionnaire. No identifying personal information was collected, ensuring the anonymity and confidentiality of all responses. Additionally, the survey was designed in a way that all items related to demographic information were optional, thus respecting the right of participants to withhold information they were uncomfortable disclosing.

The instrument used to assess perceived barriers to physical activity—the Barriers to Being Active Quiz (BBAQ)—is publicly available and intended for non-commercial academic and educational use. Therefore, no permission was required for its use in this

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study. The researchers ensured that all ethical standards outlined in the Declaration of Helsinki and local institutional guidelines were upheld throughout the research process.

## Results

This section presents the findings of the study, organized according to the research objectives. It begins with the demographic profile of the 531 college student respondents, followed by the identification of significant perceived barriers to physical activity based on the Barriers to Being Active Quiz (BBAQ). Subsequently, the section outlines the results of inferential statistical analyses that examined the differences in perceived barriers across various demographic groups using t-tests and ANOVA. Finally, it details the outcomes of binary logistic regression analyses, which identify which demographic variables significantly predict the likelihood of experiencing specific types of physical activity barriers. All statistical results are reported with their corresponding p-values, odds ratios, and model fit indicators where applicable.

### Demographic Factors Influencing Barriers to Physical Activity Participation

This section presents the binary logistic regression results identifying which demographic variables significantly influence the perception of physical activity barriers. The focus is on four key domains: Lack of Time (LT), Influence from Others (IO), Lack of Energy (LE), and Lack of Willpower (LWP).

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**Table 1:** *Factors That Significantly Influence Barriers to Physical Activity Participation Along Lack of Time (LT), Influence from Others (IO), Lack of Energy (LE), and Lack of Willpower (LWP)*

| FACTORS | LT | | IO | | LE | | LWP | |
|---|---|---|---|---|---|---|---|---|
| | EST. | OR | EST. | OR | EST. | OR | EST. | OR |
| Gender Identity | | | | | | | | |
| Female > Male | 0.534** | 1.706 | 0.274$^{ns}$ | 1.315 | 0.767** | 2.153 | 0.826** | 2.284 |
| LGBTQIA++ > Male | 0.384$^{ns}$ | 1.468 | 0.187$^{ns}$ | 1.205 | 0.859$^{ns}$ | 2.361 | 0.821$^{ns}$ | 2.274 |
| Prefer not to say > Male | 0.589$^{ns}$ | 1.802 | 0.848$^{ns}$ | 2.334 | 1.848$^{ns}$ | 6.350 | 1.783$^{ns}$ | 5.945 |
| Year Level | | | | | | | | |
| Sophomore > Freshman | 0.271$^{ns}$ | 1.311 | 0.596* | 1.814 | 0.289$^{ns}$ | 0.806 | 0.573$^{ns}$ | 1.774 |
| Junior > Freshman | -0.312$^{ns}$ | 0.732 | 0.030$^{ns}$ | 1.030 | -0.215$^{ns}$ | 0.533 | -0.417$^{ns}$ | 0.659 |
| Senior > Freshman | -1.121** | 0.326 | -0.223$^{ns}$ | 0.800 | -0.629$^{ns}$ | 1.335 | -0.638$^{ns}$ | 0.529 |
| Field of Study | | | | | | | | |
| HUMMS > STEM | -0.630** | 0.532 | -0.705** | 0.494 | -0.734** | 0.480 | -0.949** | 0.387 |
| Other > STEM | -0.501$^{ns}$ | 0.606 | -0.143$^{ns}$ | 0.867 | -0.355$^{ns}$ | 0.701 | -1.413$^{ns}$ | 0.244 |
| Residence | | | | | | | | |
| Urban > Rural | -0.046$^{ns}$ | 0.732 | 0.086$^{ns}$ | 1.090 | 0.152$^{ns}$ | 1.164 | 0.120$^{ns}$ | 1.127 |
| Socio-Economic Status | | | | | | | | |
| Middle > Low | -0.169$^{ns}$ | 1.311$^{ns}$ | -0.576** | 0.562 | -0.305$^{ns}$ | 0.737 | -0.426* | 0.653 |
| Accuracy Measures | VALUES | | | | | | | |
| $\chi^2$ | 39.20** | | 36.30** | | 43.90** | | 60.6** | |
| Cox and Snell's $R^2$ | 0.07 | | 0.07 | | 0.08 | | 0.11 | |
| Nagelkerke's $R^2$ | 0.10 | | 0.09 | | 0.12 | | 0.16 | |
| Accuracy | 0.63 | | 0.66 | | 0.69 | | 0.72 | |
| Specificity | 0.58 | | 0.85 | | 0.22 | | 0.28 | |
| Sensitivity | 0.67 | | 0.38 | | 0.92 | | 0.91 | |

The logistic regression analysis identified several statistically significant demographic predictors of perceived barriers to physical activity participation across the domains of lack of time, influence from others, lack of energy, and lack of willpower. In the Lack of Time (LT) category, gender identity emerged as a significant factor. Female students were 1.706 times more likely than male students to perceive lack of time as a barrier to being physically active ($p < .01$), suggesting that gender-related differences in academic workload, domestic responsibilities, or time management may be associated with this perception. Meanwhile, students in their senior year showed significantly lower odds (OR = 0.326, $p < .01$) of reporting lack of time as a barrier compared to freshmen, indicating that time constraints might lessen as students progress through college—

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possibly due to greater familiarity with schedules or improved academic coping strategies. Moreover, students enrolled in the HUMSS strand were less likely to perceive this barrier than those in STEM (OR = 0.532, $p < .01$), which may reflect differences in course load intensity or physical activity integration across academic tracks.

In terms of the Influence from Others (IO) domain, sophomore students had significantly higher odds (OR = 1.814, $p < .05$) of reporting that social factors negatively influenced their participation in physical activity compared to freshmen. This could imply a transitional stage where peer influence or shifting social dynamics become more prominent. Conversely, HUMSS students (OR = 0.494, $p < .01$) and those from middle-income households (OR = 0.562, $p < .01$) were significantly less likely to report this barrier. These findings suggest that certain academic backgrounds and socio-economic contexts may foster more independence or less reliance on external validation when it comes to engaging in physical activity.

For the Lack of Energy (LE) barrier, female students again reported significantly higher odds (OR = 2.153, $p < .01$) compared to their male counterparts. This suggests that energy-related constraints may be more commonly experienced by female students, potentially due to combined academic, emotional, and physical demands. In contrast, students from the HUMSS field reported lower odds of identifying this barrier (OR = 0.480, $p < .01$), indicating that students in this academic track may be less physically or mentally drained or more accustomed to incorporating physical activity into their routines.

Finally, in the Lack of Willpower (LWP) domain, female students were found to be more than twice as likely as males (OR = 2.284, $p < .01$) to perceive willpower as a limiting factor in engaging in physical activity. Students from the HUMSS strand again showed significantly lower odds (OR = 0.387, $p < .01$), reaffirming their consistent tendency to report fewer psychological or behavioral barriers. Additionally, students from middle-income backgrounds were less likely than those from low-income groups to report lack of willpower as a barrier (OR = 0.653, $p < .05$), suggesting that financial stability may contribute to increased self-regulation or motivation in health-related behaviors.

Overall, the data show that gender identity, academic year level, field of study, and socio-economic status are significant contributors to how students perceive internal

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and external barriers to physical activity. The patterns across multiple domains indicate that these demographic variables influence not just one but several dimensions of students' readiness or capacity to engage in physical activity. These results provide a strong empirical basis for deeper discussion and future programmatic interventions that consider these contextual and identity-related factors.

## Demographic Factors Influencing Barriers to Physical Activity Participation

This section continues the presentation of binary logistic regression results identifying the demographic predictors of perceived barriers to physical activity. Table 2 summarizes the significant predictors across three remaining barrier domains: Fear of Injury (FI), Lack of Skill (LS), and Lack of Resources (LR). The table includes odds ratios (OR), significance levels, and model fit statistics that describe the relationship between demographic variables and each perceived barrier.

**Table 2.** *Factors That Significantly Influence Barriers to Physical Activity Participation Along Fear of Injury (FI), Lack of Skill (LS), and Lack of Resources (LR)*

| FACTORS | FI | | LS | | LR | |
|---|---|---|---|---|---|---|
| | EST. | OR | EST. | OR | EST. | OR |
| Gender Identity | | | | | | |
| Female > Male | 0.277$^{ns}$ | 1.318 | 0.661** | 1.937 | - | - |
| LGBTQIA++ > Male | -0.627$^{ns}$ | 0.534 | 0.672$^{ns}$ | 1.959 | - | - |
| Prefer not to say > Male | -0.020$^{ns}$ | 0.981 | 0.106$^{ns}$ | 1.112 | - | - |
| Year Level | | | | | | |
| Sophomore > Freshman | - | - | 0.234$^{ns}$ | 1.263 | 0.278$^{ns}$ | 1.320 |
| Junior > Freshman | - | - | -0.248* | 0.281 | -0.081$^{ns}$ | 0.922 |
| Senior > Freshman | - | - | -1.268$^{ns}$ | 1.263 | -0.584$^{ns}$ | 0.557 |
| Field of Study | | | | | | |
| HUMMS > STEM | 0.335$^{ns}$ | 1.398 | -0.111$^{ns}$ | 0.895 | -0.445* | 0.641 |
| Other > STEM | 2.151** | 8.597 | 1.690** | 5.421 | -0.183$^{ns}$ | 0.833 |
| Residence | | | | | | |
| Urban > Rural | -0.325$^{ns}$ | 0.722 | -0.156$^{ns}$ | 0.855 | - | - |
| Socio-Economic Status | | | | | | |
| Middle > Low | -0.057$^{ns}$ | 0.945 | -0.580** | 0.560 | -0.257$^{ns}$ | 0.773 |
| Accuracy Measures | VALUES | | | | | |
| $\chi^2$ | 14.80** | | 36.20** | | 15.90** | |
| Cox and Snell's $R^2$ | 0.03 | | 0.07 | | 0.03 | |
| Nagelkerke's $R^2$ | 0.05 | | 0.10 | | 0.04 | |
| Accuracy | 0.88 | | 0.77 | | 0.57 | |
| Specificity | 0.99 | | 0.99 | | 0.64 | |
| Sensitivity | 0.02 | | 0.07 | | 0.45 | |

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The results in Table 4b indicate several significant predictors for perceived barriers related to fear of injury, lack of skill, and lack of resources. In the Fear of Injury (FI) domain, only one variable showed a statistically significant effect. Students from academic tracks categorized as "Others" (outside STEM and HUMSS) were over eight times more likely to perceive fear of injury as a barrier (OR = 8.597, $p < .01$) compared to STEM students. Although female students had slightly higher odds (OR = 1.318), this was not statistically significant, and no other gender, year level, or socio-economic status variables were significant in this domain.

In the Lack of Skill (LS) category, female students showed significantly higher odds (OR = 1.937, $p < .01$) of perceiving skill limitations as a barrier compared to males. Likewise, students from "Other" academic tracks had a strong positive association with this barrier (OR = 5.421, $p < .01$). Interestingly, junior students had significantly lower odds than freshmen (OR = 0.781, $p < .05$), suggesting a decrease in perceived skill-related barriers as students advance academically. Socio-economic status was also significant: students from middle-income households were less likely to report skill deficiency as a barrier (OR = 0.560, $p < .01$).

For Lack of Resources (LR), the only significant demographic predictor was field of study. Students from HUMSS had significantly lower odds of perceiving this barrier (OR = 0.641, $p < .05$) than their STEM counterparts. While some gender groups and income brackets showed elevated or reduced odds, these effects did not reach statistical significance. Furthermore, the model's predictive power was moderate, with a Nagelkerke $R^2$ of 0.04 and an accuracy of 57%.

Overall, field of study consistently emerged as a significant predictor across all three domains, particularly among those enrolled in non-STEM tracks. While female students tended to perceive more barriers related to skill, this was not uniformly observed across all barrier types.

## Discussion

This study examined the extent to which demographic variables influence college students' perceived barriers to physical activity across seven domains: lack of time, influence from others, lack of energy, lack of willpower, fear of injury, lack of skill, and

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lack of resources. The results reveal that demographic characteristics such as gender identity, academic year level, field of study, and socio-economic status significantly predict variations in perceived barriers, offering important implications for inclusive and targeted physical activity promotion strategies in higher education.

Gender identity emerged as one of the most consistent predictors across multiple domains. Female students were significantly more likely to perceive barriers related to lack of time, energy, willpower, and skill. These findings echo earlier research highlighting those women, especially in academic settings, face greater internal and external constraints that reduce physical activity participation (Bobo-Arce et al., 2024). The reported lack of time could stem from the disproportionate burden of academic workloads, household responsibilities, or societal expectations that prioritize appearance over physical capability (Pérez-Enseñat & Moya-Mata, 2020). Additionally, the higher odds of females perceiving a lack of energy and willpower may reflect greater psychological fatigue, role strain, or limited recovery time between tasks—factors known to negatively affect motivation and participation in physical activity (Martínez-Sánchez et al., 2024).

Gender identity was also a key factor in the perceived lack of skill domain. The significant odds for female students in this category reinforce previous findings that many women report lower confidence in their physical competence or ability, often shaped by limited early sports exposure or experiences with gender stereotyping in PE classes (Chihuailaf-Vera et al., 2023). These psychological barriers tend to persist into adulthood unless actively addressed through inclusive, skill-building programs. Interestingly, students identifying as LGBTQIA++ and those who preferred not to state their gender also exhibited elevated odds in some domains (e.g., lack of resources, fear of injury), though many of these relationships were not statistically significant—likely due to small subgroup sizes. Still, the trend aligns with research showing that gender-diverse individuals often encounter structural and psychosocial obstacles in accessing inclusive physical activity environments (Deng, 2023).

Academic year level was another variable of interest. Senior students reported significantly lower odds of perceiving lack of time as a barrier, suggesting that as students advance through college, they may develop better time management skills, stronger

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routines, or greater autonomy in balancing responsibilities. Junior students also reported fewer concerns about lack of skill, perhaps due to increased exposure to structured physical activity programs or prior experience that boosts confidence and capability (Yen et al., 2024). Sophomore students, on the other hand, were more likely to cite influence from others as a barrier, suggesting a transitional period where peer dynamics or academic pressure may strongly affect decision-making related to health behaviors (Romero et al., 2021).

The study also identified field of study as a strong and consistent predictor. Students in the HUMSS strand were significantly less likely to perceive barriers across several domains including lack of time, influence from others, energy, willpower, and resources. This may be explained by differences in academic culture or workload between HUMSS and STEM programs. STEM students often face intense academic pressures and long sedentary study hours, which can reduce time, motivation, and perceived competence in physical activity (Garcia et al., 2023). Conversely, HUMSS students may have greater exposure to social science discourses that promote holistic well-being and less rigid schedules, allowing for easier integration of physical activity into daily life.

Surprisingly, students in the "Others" category—those outside of STEM and HUMSS—had the highest likelihood of perceiving fear of injury and lack of skill as barriers. This finding may indicate that students in niche academic programs (e.g., fine arts, technical-vocational tracks) lack both the access and prior training needed to confidently participate in physical activity. Fear of injury, in particular, can act as a psychological deterrent, especially for those with little or no background in fitness training, and may be intensified by perceived or actual physical vulnerabilities (Blackwell, 2023).

Socio-economic status (SES) also emerged as a significant influence. Middle-income students were consistently less likely to report barriers such as influence from others, lack of willpower, lack of skill, and lack of resources. These findings align with the socio-ecological framework, which posits that financial stability enables greater access to supportive environments, proper equipment, safe facilities, and motivational support systems (Li, 2024). Conversely, students from lower-income backgrounds may struggle with transportation, resource availability, or community safety, all of which can

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hinder participation and reinforce negative perceptions about physical activity (Wargama et al., 2024).

From a policy standpoint, these demographic disparities underscore the need for universities and government agencies to strengthen institutional and national initiatives promoting physical activity. The findings support the objectives of the Department of Health's "Healthy Pilipinas" framework and the Philippine Development Plan 2023–2028, both of which emphasize active lifestyles as key strategies for preventing non-communicable diseases. Integrating structured physical activity programs and facilities into higher education aligns with the Commission on Higher Education (CHED) Memorandum Orders on wellness and student development. Likewise, universities can incorporate inclusive, gender-sensitive, and context-specific physical activity programs within their curricula to address barriers identified among vulnerable groups, particularly women, STEM students, and low-income learners.

Furthermore, by linking demographic predictors to institutional contexts, the study contributes to the growing discourse on equitable access to wellness opportunities in Philippine higher education. These findings highlight the critical role of school leadership, curriculum developers, and physical education instructors in designing evidence-based initiatives that foster motivation, confidence, and participation across diverse student populations.

Finally, the regression models showed modest overall accuracy and explained variance, with Nagelkerke $R^2$ values ranging from 0.04 to 0.17 across all domains. While these figures indicate that demographic predictors account for a small to moderate portion of variance in perceived barriers, they nevertheless highlight actionable differences that can guide policy and practice. The high specificity but low sensitivity of most models suggests that while the predictors are good at identifying those who do not experience barriers, they are less effective at capturing those who do—a common limitation in self-report survey studies (Judah et al., 2022).

In sum, the findings support the notion that perceived barriers to physical activity among college students are shaped by a complex interaction of personal identity, academic context, and socio-economic standing. This supports the conclusions of earlier studies emphasizing the importance of individualized and context-sensitive strategies to

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improve participation (Pardo et al., 2021; Frederick et al., 2022). By situating these findings within both theoretical and policy frameworks, the study advances current understanding of the social determinants of physical activity and provides practical direction for institutions to promote student wellness through informed, evidence-based action plans.

**Limitations of the sudy**

Despite the valuable insights yielded by this study, several limitations must be acknowledged to contextualize the findings.

First, the use of a cross-sectional design limits the ability to establish causality between demographic factors and perceived physical activity (PA) barriers. The associations identified reflect correlations at a single point in time and may not capture changes in perceptions or behaviors across semesters or academic years. This temporal limitation means that observed relationships may vary depending on academic workload, institutional environment, or post-pandemic lifestyle adjustments, which were not captured within the study period.

Second, non-probability convenience sampling was employed, which may introduce sampling bias. Although efforts were made to include a diverse student population from both rural and urban state universities, the findings may not be fully generalizable to all Filipino college students, particularly those enrolled in private institutions or from underrepresented regions. This limitation may have influenced the distribution of certain demographic categories (e.g., gender identity or socio-economic background), potentially affecting the strength and direction of some associations.

Third, the study relied exclusively on self-reported data collected through an online survey. As such, the responses may be influenced by social desirability bias, recall bias, or misinterpretation of items, especially in assessing personal and psychological barriers like willpower or skill perception. These biases could have led to either overestimation or underestimation of specific barriers, thereby affecting the precision of the reported odds ratios.

Fourth, while the Barriers to Being Active Quiz (BBAQ) is a validated tool, it was originally developed for broader adult populations and not specifically tailored to the

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Filipino collegiate context. Cultural nuances, local environmental constraints, and academic stressors unique to higher education in the Philippines may not be fully captured. This contextual gap may partly explain why some barrier domains, such as social influence or fear of injury, showed weaker predictive relationships in the regression analysis.

Fifth, although binary logistic regression enabled the identification of significant predictors, the modest values of Nagelkerke $R^2$ and low sensitivity scores suggest that additional unmeasured variables—such as mental health status, physical environment, or prior PA experience—may further explain students' perceptions of barriers. Hence, the findings should be interpreted with caution, recognizing that demographic factors represent only one layer within the complex network of influences shaping physical activity behavior.

Future research should consider longitudinal designs, incorporate qualitative methods to explore contextual factors, and include broader geographical samples to enhance generalizability and depth of analysis.

## Conclusion

This study explored how demographic characteristics influence college students' perceived barriers to physical activity participation, using logistic regression analysis across seven domains: lack of time, influence from others, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. The findings revealed that gender identity, academic year level, field of study, and socio-economic status significantly shaped students' likelihood of encountering specific physical activity barriers.

Notably, female students consistently reported higher odds of experiencing barriers, particularly in the domains of time, energy, willpower, and skill. These results affirm long-standing gender disparities in physical activity engagement and emphasize the need for gender-sensitive interventions. Meanwhile, senior students were less likely to perceive time as a barrier, pointing to the potential positive impact of academic maturity and improved time management. Field of study was also a strong predictor, with STEM students more likely to report barriers compared to their HUMSS and "Other"

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counterparts, likely due to higher academic loads and reduced curricular flexibility. Additionally, students from middle-income households reported fewer barriers, highlighting the role of economic stability in facilitating active lifestyles.

These findings have significant implications for educational policy and institutional planning. Universities may use the results to design targeted wellness initiatives, enhance access to sports and fitness facilities, and integrate adaptive physical education modules that consider academic demands and gender inclusivity. National agencies such as CHED and DOH can likewise use the evidence to align higher education policies with the Healthy Pilipinas advocacy, ensuring that physical activity promotion becomes an integral component of student life and holistic education.

Taken together, these findings underscore that perceived barriers to physical activity are not merely personal or motivational but are deeply rooted in students' socio-demographic contexts. This highlights the importance of adopting tailored, inclusive, and contextually relevant physical activity programs within higher education institutions. Addressing the unique constraints faced by different subgroups—particularly females, STEM students, and low-income individuals—may enhance participation and support more equitable access to physical activity among college students.

Finally, this study contributes to the body of knowledge on physical activity behavior by linking demographic determinants to institutional and policy-level contexts. By advancing an evidence-based understanding of how social and academic factors interact to shape participation, the research provides actionable insights that can inform future interventions, institutional reforms, and public health strategies in the Philippines.

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