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From stress to strength: The influence of physical activity on the mental well-being of students

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Abstract

Engaging of students in some physical exercise helps promote positive mental health and even reduces the chances of developing some forms of mental disorder. This particular study intends to assess the importance of physical activity in relation to students' mental health and ascertain differences in these two factors in terms of demographic variables. A descriptive cross-sectional approach was utilized in this study using The Global Physical Activity Questionnaire (GPAQ) to assess the students' physical activity, while the General Health Questionnaire-12 (GHQ-12) was used for the assessment of mental health among nursing students of a Catholic University in Santiago City, Philippines. The results showed that the level of physical activity and mental health status of the population studied correlated poorly, as well as did the level or any other demographic variable of the population's mental health, and physical activity. The findings suggest that there may be other factors that can account for nursing students' mental health. Although, it is appreciated that being active is beneficial, the present research could not demonstrate any positive effects of physical activity, on mental health. A more holistic approach to their well-being where the mental health of nursing students is called is suggested.

Keywords: *health, mental well-being, mental health, physical activity, physical exercise*

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1. Introduction

Mental health disorders are a major public health concern affecting an individual, families, and society. Serious depression and anxiety disorders affect more than 260 million people, with the latter being the leading cause of disability, contributing to the total burden of sickness globally (World Health Organization, 2021). This requires a new and innovative approach to prevention and treatment since the prevalence of these conditions is still on the rise with better treatment and education. Building an exercise habit currently is as effective as any other means of facilitating psychological well-being and reducing the risk of psychological diseases (Schuch et al., 2021; Smith & Merwin, 2021; Herbert, 2022; Coventry et al., 2021; Huang et al., 2023), which are deemed more broadly as any energy-expending physical activity undertaken by skeletal muscles. Expenditure on physical activity covers the scale from constant walks, gardening, and housekeeping, to a more formal exercise programme. Physical activity does not only make the body better; it also facilitates psychological and emotional well-being.

Studies have illustrated how physical exercises can be used to treat various psychiatric conditions. For instance, the research has established that exercising individuals are at a reduced risk of falling victim to anxiety and depression disorders (Harvey et al., 2018; Schuch et al., 2018). Thousands of studies reflect that exercise intervention enhances the benefits that could be observed in clinical populations; it helps decrease the anxiety and depressive symptoms with outcomes often equal to or surpassing traditional treatments for such disorders (Cooney et al., 2017; Josefsson et al., 2017). Indeed, the interrelation between physical activity and mental health is managed by a unique ensemble of various systems, including ones that are social and psychological as well as physiological. It has been found that exercise stimulates the secretion of growth factors, neurotransmitters, and endorphins. The latter result in an improvement in mood, reduction in inflammation, and neuroplasticity (Dinas et al, 2017; McDowell et al., 2019). Group-based activities are helpful for creating social relationships, fostering social support, and building protective aspects against mental health issues (Mahindru et al., 2023). It shows a wide acceptance of physical exercise to be an asset for mental health improvement, while research into such an aspect is relatively conspicuous in the link between physical activity and mental health outcomes.

Numerous studies show that exercise programs such as walking can help to decrease symptoms of depression, anxiety, and stress, but little is known about how to efficiently

incorporate exercise into campaigns aimed at mental health awareness. Many health agencies in several countries emphasize on talk therapies and medication but fails to popularize the use of exercise as a proactive, preventive mental health intervention. Moreover, findings from research indicate that the maintenance of physical activity can possibly enhance mood, reduce symptoms of most mental health conditions, and improve cognitive functioning through the release of endorphins and enhancement of neuroplasticity (Mahindru et al., 2023). Despite these advantages, campaigns intended to create greater awareness about mental health usually overlook exercising as an adjunctive treatment. Therefore, there is a need for researches into the role of exercise in promoting mental health as well as the best ways of advocating for its adoption in public health messages.

The study of Schuch et al. (2018) fill in the importance of the research gap through more nuanced research on the effects of tailored exercise regimens on mental health across diverse groups. There is also an evidence gap in the amount and strength of the most effective types of physical activity may differ from conditions of many types of mental health. Although physical exercises, such as jogging or swimming, have been suggested to sustain general mental health, much is not known about the potential of strength training, yoga, or low-intensity activities such as walking for individuals with specific mental health conditions. In line with this, a one-size-fits-all approach is likely inappropriate, as exercises differ in suitability for certain populations and populations may vary, for example, more severely anxious individuals or those with bipolar disorders (Schuch et al., 2018.

There is also few research on the long-term sustainability of workout interventions for management of mental health. Though numerous studies undertaken to attest that a short-term outcomes of exercise about mood enhancement. Compared to other few studies, they probe into long-term mental health assistances after maintaining a consistent pattern of exercise. This also poses a challenge in maintaining the exercise habit for those who suffer from mental illness, as they are less likely to be motivated and may feel tired or have physical disabilities (Schuch et al., 2016). Leaving the benefits of physical activity for mental health underutilized due to uncertainty on how to maintain long-term exercise habits. Physical activity increases self-esteem, self-efficacy, and perceived control of one's life, thereby acting as a buffer against stress and negative affects (Craft & Landers, 2017). The growing body of data suggests that physical activity has direct benefits to mental health, but several issues remain and present a challenge.

Some significant problems associated with mental health do not have a single standardized definition; major concerns are anxiety and depression, seen at relatively high prevalence rates in young people (Biddle et al., 2019). The association between physical exercise and mental health is not well defined. Physical exercise was related to less risk for developing diabetes, cardiovascular disease, stroke and death from all causes. Still, there is solid research evidence that suggests activity can be related to better mental well-being. Relatively few studies have examined this relationship among student nurses. In fact, many nursing school students perceive nursing school as stressful and demanding. Moreover, nursing students are also susceptible to stress, anxiety, and depression. Nursing school is a complex and demanding program that quite often challenges students to overcome many personal, professional, and educational barriers. Hence, it is vital to analyze how exercise aids in facilitating success and well-being in nursing students.

A large number of studies have already shown the advantages of physical activity for overall health and scholarship. However, there is a dearth of research on its specific impact on nursing students. Hence, this research study aims to bridge this gap by studying connections between the levels of physical activity and other outcomes that are relevant to nursing practice and education. According to Lee et al. (2022), the nursing students are very stressed out, anxious, and depressed. Therefore, a high probability of mental health disorders along with unhealthy lifestyles prevails amongst nursing students. Some of the disciplines engaged in thorough research about the relationship between physical activity and mental health are psychology, psychiatry, neuroscience, and public health. Among them, two of the mildest to moderate mental health conditions that have been highly affected by physical activity are depression and anxiety (Lee et al., 2022). Although Paluska (2017) mentions how depressed persons often tend to be less physically active than their non-depressed counterparts, studies have shown how sharply increasing aerobic activity or strength training can dramatically lessen depressive symptoms.

This study aims to establish whether physical exercise had an influence on the mental health of nursing students. Despite such limitations, this study envisions on advancing the knowledge on how physical exercises influence mental well-being. With this, the aim to evaluate the probable benefits and results of physical activities on the psychological well-being of nursing students at a university in the Philippines.

2. Literature review

2.1 The Importance and Benefits of Physical Activity to Nursing Students

The physical activity is considered a vital component to everyone's healthy lifestyle, and as a nursing student it is a must to recognise it as they advocate for general health and wellness (Cilar et al., 2017). Reduced physical activity can have an impact on mental health and contribute to the development of illnesses such as sadness and anxiety. Furthermore, advocating for an active and healthy lifestyle among student nurses is important since it helps them promote good behaviours to their patients (Geok et al., 2015). The relevance of physical exercise in fostering a healthy lifestyle among student nurses emphasise the benefits of regular physical activity on overall well-being (Geok et al., 2015). In addition, the relevance of physical activity among nursing students emphasises the need of the students in physical activities to improve exercise capacity, physical fitness, and overall health benefits, mostly for nursing students (Cilar et al., 2017). According to Alkhawaldeh et al. (2024), numerous advantages were perceived of physical activity, such as enhancing flexibility, endurance and strength likewise, enhancing physical appearance, stress alleviation, boosting productivity, and uplifting self-assurance. In addition, Posadzki et al (2020) cite that physical activities give several negative and positive health outcomes specifically decline in cognition, mortality, high glycemic index, pain, mobility, bone strength and well-being (Posadzki et al., 2020). Furthermore, Cilar et al., (2017) explored the main dimensions of physical activity implementation among nursing students, including attitudes towards physical activity, barriers, and motivation and incentives (Cilar et al., 2017).

Despite the well-known advantages of physical movement for mental health, research shows that nursing students frequently participate in insufficient amounts of exercise (Baj-Korpak et al., 2020), with sedentary behaviour pervasive throughout their academic career. Time restrictions, academic burden, exhaustion, and a lack of enthusiasm are all factors that prevent nursing students from engaging in physical activity. Furthermore, the stress and obligations of nursing school may discourage students from prioritizing their physical health and well-being. The lack of understanding regarding the optimal dose, volume, and intensity of physical activities as a barrier to nurse engagement in physical activities emphasize the importance of promoting physical activity among nurses (Veseta et al., 2022). Hence, factors like sex, perception and issues about health, including time spent on looking for health

information on the internet have overall impact on health promotion behaviour of every individual.

2.2 Promotion of Physical Activity and Mental Health

The World Health Organization defines mental health as a condition of a well-being in which people able to recognise their potential, manage with stressors in their life, able to work effectively, and contribute to their surroundings. Mental health protection derives from the literal sense of protection, in which it is to keep an individual safe from any harm, danger or damage (Singh et al., 2022). It includes the learning on how to maintain positive mental health, prevent mental diseases and treatments, stigma reduction, and increased help-seeking effectiveness. It also emphasizes the ramifications of such treatments in low-resource settings and suggests future approaches to mental health promotion and prevention (Mansfield et al., 2020).

There are several strategies that have been suggested and have been developed to enhance and increase physical exercise and have a positive mental health outcome for nursing students. These include educational programs like health teaching to raise awareness about the benefits of exercise to address stress and provide stress management. Likewise, the establishment of resources relating to physical activity in every school, incorporation of physical activity into the curriculum of nursing program, and also the implementation of exercise breaks during lectures or even during their clinical rotations (Maselli et al., 2018; Vaez & Laflamme, 2008). An additional helpful strategies suggested by Wang et al. (2023) revolve around support systems, which directly pointing on the family and friends, therapies, seminars and workshop on stress management that have revealed a potential in encouraging nursing students to adopt healthier lifestyle habits and better cope with academic challenges.

According to Sodeify et al. (2020), multifaceted issues give impact on the mental health among nursing students, often face higher levels of stress, anxiety, and depression than their classmates in other academic fields. Similarly, numerous studies have consistently shown that nursing students have high rates of mental health problems, with factors such as loaded with academic work, clinical placements or duties in the hospital, and personal life stressors contributing to their psychological distress and becoming their burden (Labrague et al., 2018; Quek et al., 2019). It is therefore necessary to emphasize the effective intervention of healthcare practitioner including appropriate mental health services that should be rendered

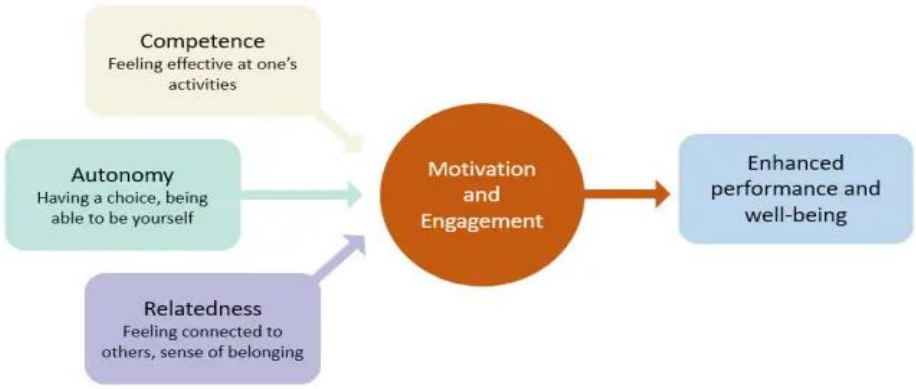
(Sodeify & Tabrizi, 2020). The experiences and the perspectives of nursing students about mental health and illness emphasize the priority of early detection and treatments (Alexander et al., 2023).

2.3 Theoretical Framework

The Self-Determination Theory (SDT) developed in the year 2000 is the theoretical framework used in this study. The SDT of motivation was established by psychologists Edward Deci and Richard Ryan, and it overthrew the conventional wisdom that the best method to motivate an individual to do tasks is to reward them for it. The theory also strongly emphasizes the three roles such as relatedness, competence, and autonomy that play in fostering psychological well-being. It is related to nursing students that frequently experience external expectations and demands, which may lessen their innate desire to be physically active. Also, the interventions based on this theory include the principles that can improve mental health outcomes by increasing motivation and encouraging prolonged physical activity by promoting autonomy and bolstering students' sense of competence in their exercise endeavors.

Figure 1

Self-determination theory



The SDT is said to be a motivational theory that has been used in various settings, including health, sports, education, and the workplace. Accordingly, health is defined as an indispensable aim for all, and it is impacted heavily by habits and lifestyle decisions while motivation, or energy focused towards goal influences lifestyle choices and capacity to make long-term adjustments to preserve health. Moreover, there are three primary psychological requirements, as illustrated graphically in figure 1. When social surroundings, includes those

in which we receive health care, are more supportive of these psychological demands, that motivation improves. Alternatively, when psychological requirements are not adequately satisfied or even hindered by social interactions, the quality of motivation is more restricted. Several researches have revealed that when an individual are more independently driven, they are more likely to attain their long-term health objectives (Deci & Ryan, 2012).

3. Methodology

3.1 Research Design

The study utilized a descriptive cross-sectional quantitative research design. This is used to investigate the relationship between physical activity and mental health among the respondents. A descriptive cross-sectional research design was an observational study that can analyzed data from a population, or a representative subset, at a specific point in time. This design involved collecting data once, providing a snapshot of the variables of interest within the population at that particular moment (Setia, 2016). The design does not involve manipulating variables or establishing cause-and-effect relationships but rather to describe the current status and situation of the variables that is being studied. It allowed the researcher to capture a snapshot of the current levels of physical activity and mental health among nursing students, which was crucial for understanding the present state of these variables within the student body. Also, by collecting data at a single point in time, this design was time-efficient and cost-effective, making it feasible to gather information from a relatively large sample of 268 nursing students within a reasonable timeframe.

3.2 Setting and Participants

The study was conducted at a University located in Santiago City, Isabela, Philippines. There were two hundred sixty-eight (268) student-nurses enrolled during the 2nd semester of the school year 2023-2024. The representation of the sample population was proportionately divided into 1st year to 4th year. The use of stratified-proportional random sampling ensured that the sample accurately represented the various year levels of the nursing program, enhancing the generalizability of the findings to the entire population of nursing students at the university.

Table 1

Demographic characteristics

	F	%
Sex		
Male	75	28.0
Female	193	72.0
Age		
18-19 years old	143	53.3
20-21 years old	112	41.8
22-23 years old	13	4.9
Year level		
1st year	104	38.8
2nd year	75	28.0
3rd year	59	22.0
4th year	30	11.2

Table 1 shows the distribution of the participants according to sex, age and year level. Majority of the participants were female (72%), under 18-19 years old (53.3%) and from 1st year level (38.8%.). As highlighted by Cilar et al. (2017), gender differences can influence health behaviors, including physical activity and mental health management. Thus, addressing the specific needs of female nursing students can potentially enhance their overall well-being and academic performance. As noted by Thivel et al. (2018), physical activity is vital for managing many stress and improving mental health, which is particularly relevant for younger students who are still adapting to the rigors of higher education. The high proportion of first-year students emphasizes the need for early intervention strategies to support academic and mental health needs. As Maselli et al. (2018) suggest, integrating physical activity into the curriculum can provide significant benefits for students' physical and mental health, aiding their transition and retention in the program.

3.3 Research Instrument

The research tool employed in this study is a General Health Questionnaire (GHQ-12) by Goldberg and Williams (1988), in English translation to answer the question about the respondents' emotional intelligence level and the Global Physical Activity Questionnaire (GPAQ) developed in 2002 by the World Health organization (WHO).

The GHQ-12 is a self-administered screening tool intended to identify cases of potential psychiatric diseases and psychological morbidity in settings like primary care or the general public. The GHQ-12 demonstrates strong reliability Cronbach's alpha of 0.82 and validity area under the receiver operating characteristic curve of 0.88, according to many studies. The GHQ-12 has 12 propositions, six of which then connected to the presence of new unpleasant experiences and six of which are related to the incapacity to perform typical functions. Every item lists a symptom associated with depression, anxiety, or psychological distress. Each item has four possible answers on a 4-option Likert-type scale: "not at all," "no more than usual," "somewhat more than usual," and "much more than usual." The GHQ score, which provides the best psychometric qualities detecting vulnerability to mental diseases, is used to quantify the acquired responses. The Likert-type scale response options are converted to a dichotomous-type scale (0–0–1) using the GHQ score.

The GPAQ addresses the question regarding the respondents' degree of physical activity. It is a standardized instrument created by the WHO to evaluate persons between the ages of 18 and 65 on their level of physical activity. The purpose of the questionnaire is to collect data regarding people's patterns of physical activity to work, transportation, and leisure activities, among other areas of everyday life. It is a set of questions intended to record the frequency, length, and intensity of various physical activities that people engage in over the course of a typical week. It asks about work-related, transportation-related, and leisure-related activities in addition to moderate- and vigorous-intensity exercises like walking and jogging. Cronbach's alpha coefficients for GPAQ items have been recorded in studies; these coefficients generally range from 0.70 to 0.85, indicating acceptable to good internal consistency. Indicating good to outstanding stability of answers over time, test-retest reliability coefficients (e.g., intraclass correlation coefficients, ICC) for GPAQ total scores have been reported between 0.70 and 0.90. To guarantee thorough coverage of pertinent activities, specialists in physical activity assessment and epidemiology provided feedback during the development of GPAQ. Content validity was determined by consensus and expert examination. There is evidence of moderate to good criterion validity in the correlations between GPAQ total scores and objective criteria measures (e.g., accelerometry), which range from 0.40 to 0.70. Significant correlations have been shown between GPAQ scores and several health outcomes, including mortality and risk factors for cardiovascular disease. For instance, the construct

validity of the GPAQ is supported by the fact that people who have more advanced levels of physical activities on the scale typically have lower risk profiles for chronic diseases.

3.4 Data Analysis

The data analysis in this study involves both descriptive statistics and inferential statistics. First, descriptive statistics used to analyze the demographic profile in terms of sex, age, and year level, as well as the level of physical activity and the mental health status of the nursing students, were examined using frequency and percentage. Second, to determine the relationship between the physical activity and mental health status of the nursing students, as well as the differences in mental health status and the level of physical activity when grouped according to their profile, inferential statistics were utilized to analyze the data, such as Chi-Square.

The GHQ-12 scores sum up the answers to all 12 questions. Lower mental health is indicated by higher scores. This modified version of the GHQ-12 can be used to evaluate nursing students' mental health and pinpoint areas that might require further assistance. The total scores can vary from 0 to 36. The following will be the scoring guide scale:

11 to 14 Normal mental issues

15 to 19 Minor mental issues

20 and above Major mental issues

The computation of GPAQ scores involves several systematic steps. Firstly, data collection is initiated by administering the GPAQ questionnaire to individuals, ensuring their truthful and comprehensive responses to each item. Secondly, physical activities reported are categorized into three distinct domains: work-related, transportation-related, and leisure-related. Within these domains, activities are further categorized based on perceived intensity, distinguishing between moderate- and vigorous-intensity activities. This categorization facilitates the conversion of reported exercise durations into weekly minutes. Subsequently, scoring entails assigning metabolic equivalent of task (MET) values to each activity based on its intensity level:

3.3 Activities of moderate intensity

4.0 Normally assigned to walking as a mode of transportation

6.7 Vigorous intensity activities

These MET values are then multiplied by the reported weekly duration (in minutes) of each activity to determine the total MET minutes for each domain. Finally, the total MET minutes per week for physical activity within each domain (work, transportation, and leisure) are computed by summing up the MET minutes of all activities within that domain. For effective interpretation and analysis, it is imperative to guarantee consistency and accuracy in data collection, activity classification, and scoring techniques to provide GPAQ results that can be trusted. Additionally, when calculating and interpreting GPAQ scores, take in consideration using the established rules and protocols supplied by the World Health Organization (WHO) or other pertinent health organizations.

3.5 Research Ethics

This study ensured strict compliance with appropriate research ethics on the conduct of research involving human subjects. The study was given permission and clearances from the University of La Salette, Inc. The study also ensured voluntary participation of the students through the consent form; the purpose and objectives of the study were clearly explained to the participants. The study also uphold strict confidentiality of the data gathered as there are sensitive information pertaining to the participants' level of mental health.

4. Findings and Discussion

Table 2

Participants' physical activity

Category	F	%
Inactive	266	99.3
Active	2	0.7

Table 2 shows the participants' distribution in two groups, inactive and active, based on their degree of physical activity. It revealed that about 99.3% of respondents are inactive, with only 0.7% engaging in regular physical activity. This alarming trend highlights the need for targeted health promotion initiatives. According to WHO, physical activity is crucial for preventing non-communicable diseases and improving overall well-being. Encouraging physical activity among nursing students is essential, as noted by Geok et al. (2015), to foster a healthy lifestyle that they can also advocate for in their future professional roles.

Table 3

Mental health status

Category	F	%
Normal mental health issues	65	24.3
Minor mental health issues	202	75.4
Major mental health issues	1	0.4

The GHQ results (table 3) show that 24.3% of respondents have normal mental health, 75.4% have minor mental health issues, and 0.4% experience severe mental health difficulties. This indicates a high prevalence of minor mental health issues, which can impact students' academic performance and well-being. Addressing these concerns is crucial, as noted by Sodeify and Tabrizi (2020), who emphasize the importance of providing culturally and practically effective mental health services to nursing students.

Table 4

Chi-square test of independence on physical activity and mental health status

	X^2	df	p-value
Physical activity Mental health status	0.658	2	0.720

As shown in table 4, the chi-square test findings reveal no significant relationship between physical activity and mental health status. Despite the well-documented benefits of physical activity on mental health (Posadzki et al., 2020), the overwhelming inactivity among respondents might have limited the variability needed to detect a significant relationship. This suggests a need for interventions to increase physical activity levels among nursing students to better evaluate its impact on mental health. Wang et al. (2023) emphasize the importance of addressing barriers to physical activity, such as time constraints and academic workload, to promote a more active lifestyle.

As shown in table 5 and table 6, the chi-square test results show no significant difference in mental health status and physical activity based on year level, age, or sex. This uniformity suggests that mental health challenges are widespread across different demographic groups within the nursing student population. Interventions should, therefore, be comprehensive and inclusive. As highlighted by Posadzki et al. (2020), regular physical

activity can significantly improve mental health outcomes, and such benefits should be communicated and encouraged across all demographic groups.

Table 5

Chi-square test of independence on mental health grouped according to profile

	X^2	df	p-value
Sex	2.220	2	0.330
Age	5.750	4	0.675
Year level	4.623	3	0.593

Table 6

Chi-square test of independence on physical activity grouped according to profile

	X^2	df	p-value
Sex	0.783	2	0.376
Age	3.000	4	0.558
Year level	2.073	3	0.557

The combined discussion of the statement of problems and literature review underscores the critical need for targeted interventions to promote physical activity and support mental health among nursing students. Addressing the specific demographic characteristics, enhancing physical activity levels, and providing strong mental health support can significantly improve the well-being and academic success of nursing students. Integrating these strategies into nursing education programs can prepare students not only for their personal health but also to advocate for the health of their future patients.

5. Conclusion

This study shows that the student-nurses are mostly inactive with minor mental issues. Furthermore, the study found no significant relationship between physical activity and mental health status of the participants, and there is no significant difference on the mental health status and the level of physical activity when grouped according to their profile.

This study recommends university administrators to implement mental health awareness programs and resources, develop policies addressing students' unique needs, and promote inclusivity on campus. Creating a supportive environment and reducing stigma can enhance engagement among individuals with minor mental health issues. With the help of

healthcare professionals or school health director, there is a need to recognize inactive respondents to develop strategies to engage them effectively. Collaborating with mental health specialists, providing integrated care, and advocating for increased access to mental health services can improve outcomes for patients with minor mental health issues. Lastly, future researchers can conduct qualitative studies to understand the experiences of inactive respondents with minor mental health issues. Exploring social determinants of health and developing interventions to increase engagement among the concern population.

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Institutional Review Board Statement

This study was conducted in accordance with the ethical guidelines of University of La Salette, Inc. The conduct of this study has been approved and given relative clearance(s) by University of La Salette, Inc.

Declaration

The author declares the use of Artificial Intelligence (AI) in writing this paper. In particular, the author used QuillBot in searching appropriate literature, summarizing key points and paraphrasing ideas. The author takes full responsibility in ensuring proper review and editing of contents generated using AI.

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