



Study Protocol

The Association Between Kinesiophobia and Self-Esteem Among Collegiate Athletes with Chronic Lower Extremity Musculoskeletal Injuries in Greater Manila: A Cross-Sectional Analytical Study Protocol

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Abstract

Background: Musculoskeletal injuries are common in collegiate athletes and can be linked to having elevated levels of kinesiophobia. Kinesiophobia, the fear of re-injury or movement, can be related to an athlete's self-esteem, as studies have shown that both variables may influence an athlete's rehabilitation. High athletic identity and low levels of kinesiophobia were seen in athletes who successfully returned to their pre-injury level of competition after rehabilitation. The working theory of this research is if an athlete has an elevated level of kinesiophobia, it decreases one's self-esteem. **Objective:** This study aims to determine the association between kinesiophobia and self-esteem among collegiate athletes in Greater Manila who have chronic lower extremity musculoskeletal injuries. The secondary objective of this study is to determine the association of kinesiophobia with demographic variables (sex, sport, and type of injury). **Methodology:** The study will be conducted from January 2023 to April 2024. The researchers will utilize online platforms and/or onsite data collection to disseminate their publication materials and questionnaires. The target participants of this study are collegiate athletes, ages 18-26, representing universities/colleges in Greater Manila, who currently have a lower extremity musculoskeletal injury lasting for 3 months or more and are not receiving physical therapy or other forms of professional treatment. The questionnaire includes the participant's name, age, sex, university, sport, type of injury, and measuring tools: Tampa Scale of Kinesiophobia, Rosenberg Self-Esteem Scale, and Numerical Pain Rating Scale. The results gathered will be analyzed using the Spearman Correlation Test to associate the variable and the Shapiro-Wilk Test to determine the normality of data. **Expected Results:** The results of the study are expected to determine the association between kinesiophobia and self-esteem among collegiate athletes with chronic lower extremity musculoskeletal injuries. The study is also expected to determine if demographic variables such as sex, type of sport, and type of injury are linked to the athletes' kinesiophobia levels. Thus, this study will aid in establishing the importance of psychological aspects in injury rehabilitation, thereby assisting healthcare professionals in determining the appropriate interventions for an athlete recovering from an injury.

Key Words: *kinesiophobia, self-esteem, chronic musculoskeletal injury*

INTRODUCTION

Intercollegiate athletes commonly suffer from musculoskeletal injuries (MSIs) with a rate of 64.1 per 1000 athlete-exposures for both contact and noncontact injuries¹, with the lower extremity being the most common area of injury in athletes.² Injuries can lead to both physical and psychological consequences. Physical consequences include loss of mobility, strength,

disuse³, and deconditioning⁴; psychological consequences include loss of self-esteem,³ depression,³⁻⁵ anxiety, and distress.⁴ These factors can hinder an athlete's recovery and ability to return to play⁶⁻⁹ and their pre-injury level.

Psychological recovery following an ACL injury, surgery, and rehabilitation may be influenced by

concerns regarding self-identity, self-esteem, self-efficacy, fear/avoidance, kinesiophobia, depression, and other emotional and behavioral aspects.¹⁰ Fear of re-injury is a typical psychological reaction of athletes with sports-related injuries, while depression, frustration, tension, and decreased self-esteem are other possible responses. Psychological responses of athletes may decrease over time during rehabilitation but may often rebound before returning to sport with a “U-pattern of recovery.” MSIs usually present with pain, which can become chronic if untreated.¹¹ Psychological factors strongly impact an athlete's return-to-sports (RTS) phase. Elevated psychological response to injury can hinder the rehabilitation process and delay RTS of the athlete if left unattended.⁷

Low kinesiophobia levels, high self-efficacy, high self-esteem, and high psychological readiness to RTS were shown by athletes who could return to sport after an ACL injury compared to those who failed.¹² Once injured, one may undergo either of the two pathways in the fear-avoidance model.¹³ They can either confront pain, leading to faster recovery or avoid it, believing that movement can worsen the pain. An increase in the athlete's fear avoidance is aligned with an athlete's decrease in physical function.¹⁴ This fear of movement is termed kinesiophobia.

Kinesiophobia is defined as an “excessive, irrational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or re-injury.”^{7,15,16} Kinesiophobia has been cited as the most common factor related to one's inability to return to sports¹⁶ and pre-injury level of activity.¹⁵ It can negatively affect physical recovery and self-reported function,⁷ and also cause poor rehabilitation results. Conversely, self-esteem is “the degree to which the qualities and characteristics contained in one's self-concept are perceived to be positive.”¹⁷ The psychological readiness for RTS of young athletes is connected with psychological factors like motivation, mood disturbance, control, recovery expectations, fear of re-injury, and self-esteem.¹⁴ Athletes with a strong athletic identity find that success or failure can significantly influence self-esteem, motivation, and overall

self-worth, while incurring injuries can be emotionally devastating, affecting the athlete psychologically.^{5,7} These can lead to negative psychological responses in athletes, such as low self-esteem, anxiety, depression, and frustration.^{7,15}

It was reported that higher levels of kinesiophobia among athletes are common in lower extremity injuries.^{3,18} A study that involves intercollegiate athletes with acute musculoskeletal injuries stated that the athlete's rehabilitation process might be delayed if an injury-related fear is left unaddressed.¹⁹ It concluded that the athletes' condition improved as their injury-related fear scores were reduced. Negative psychological responses are often greatest immediately after an injury and lessen over time.⁷ Therefore, experiencing kinesiophobia after an acute injury is an expected normal response as it serves as a defense mechanism to prevent overexertion. Over time, this fear must be reduced as the injury is expected to heal. However, it can resurface again while in the RTS phase, preventing the athlete from RTS, as seen in the U-pattern of recovery.^{7,20,21} This makes it reasonable for this study to focus on athletes with chronic musculoskeletal injuries.

Despite these, limited studies have looked at the association between kinesiophobia and self-esteem among collegiate athletes who had chronic pain after incurring any lower extremity injury. No local studies have been published on the association of demographic variables such as sex, sports, duration of playing the sport, and the type of injury. Thus, this study primarily aims to determine the association between kinesiophobia and self-esteem in collegiate athletes from Greater Manila who have sustained chronic lower extremity musculoskeletal injuries during sports participation. The secondary aim is to determine the relationship between kinesiophobia and various demographic factors, such as collegiate athletes' sex, sport, and type of injury.

This study can educate athletes, coaches, and other healthcare professionals that the physical and psychological aspects must be considered when dealing with an injury. Moreover, the study's results can aid healthcare professionals

in determining the appropriate interventions for an athlete recovering from an injury, contributing to improved physical and psychological interventions that can be incorporated into rehabilitation programs. The study's findings can also aid future researchers in identifying the factors related to athletes' sense of kinesiophobia and self-esteem, which would help them determine the appropriate intervention for their injury.

METHODS

Ethical Consideration. The study was approved by the University of Santo Tomas-College of Rehabilitation Sciences Ethics Review Committee with Protocol Number SI-2023-003 last January 18, 2024.

Study Design. This study is observational research that will utilize a cross-sectional analytical study design and will be used to find an association between the athletes' levels of kinesiophobia and self-esteem. This study will only find the association and not the causality of the variables.

Setting. The research study will be conducted from January 2023 to April 2024 and will use online platforms to communicate with the participants. The researchers will contact the schools and teams that may participate in the study. The schools included in the study are colleges and universities with sports teams located in the Greater Manila Area. The questionnaires will be given to the participants either online or onsite through Google Forms.

Participants. The target participants of this study are collegiate athletes representing universities/colleges in Greater Manila who currently have a chronic musculoskeletal lower extremity injury and are not receiving physical therapy or other forms of treatment since treatment in individuals with kinesiophobia resulted in a decrease in fear of movement.²² The participants' age was based on the average age of college students, 18-24.²³ It was adjusted based on the latest rule of the UAAP and NCAA, that an athlete must not exceed 26 years old to be eligible to play.²⁴ Collegiate athletes were chosen because studies showed that injuries are common among university-level athletes, with

competitive collegiate athletes sustaining an average of 2 injuries annually.²⁵ Lower extremity injury was chosen since it was reported that higher levels of kinesiophobia among athletes are common in lower extremity injuries¹⁸ and are associated with lower physical function.³ The chosen setting was universities and colleges in Greater Manila because most of the top universities in the Philippines are found in Greater Manila based on different local and international rankings.²⁶⁻²⁸ Greater Manila was the chosen area due to its accessibility to the researchers, making it fit for an initial study.

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Collegiate Athlete (18-26 years old) ^{23,24}	Those with acute injuries in the lower extremities. An acute injury is a sudden injury and is caused by a specific event ²⁹
Currently an enrolled active member of a university/college-recognized sports team in Greater Manila	Had received or is currently receiving any form of treatment or intervention for the chronic lower extremity injury (e.g., rehabilitation, physical therapy, acupuncture, therapeutic massage, other therapeutic strategies, etc.)
Currently has a musculoskeletal lower extremity injury caused by sports participation (scrimmages, tune-ups, weights training, skills training, etc.) lasting for 3 months or more ^{29,30}	
Currently experiencing pain from the musculoskeletal injury for 3 months or more from the initial occurrence of the injury	

The sample size was determined using the G*Power version 3.1.9.6 software. An a priori sample size using a two-tailed hypothesis was selected. The medium effect size was set to 0.3 with an alpha, or significance level of 0.05, and 80% confidence or the power of the study.³¹ It was calculated that 82 would be the total sample size, and 10% (8.2 or 9) would be added in any case of participants not answering the questionnaires. Thus, a total of n= 91 participants are needed for the study. Snowball and purposive sampling will be utilized.

Snowball sampling will be done by reaching out to coaches, school administrators, research department heads, and athletes, which will aid in determining what colleges and universities to visit for onsite data gathering. Purposive sampling will be done through online and/or onsite recruitment.

Instrumentation. The study will utilize the following tools: (1) the Tampa Scale of Kinesiophobia (TSK) to determine the kinesiophobia levels of the athletes, (2) the Rosenberg Self-Esteem Scale (RSES) to determine their level of self-esteem, and (3) the Numerical Pain Rating Scale (NPRS) to determine the level of pain the athletes are currently experiencing. All these tools will be incorporated into the self-administered questionnaire deployed to the participants via Google Forms.

The TSK will assess the fear of movement in individuals who experience musculoskeletal pain.³² The TSK has two subscales: activity avoidance, which refers to thinking that a particular activity may result in injury or re-injury, and somatic focus, which is related to the thinking that one has latent and severe medical conditions. The original TSK-17 English version consists of 17 items that use a 4-point Likert Scale with a score ranging from 17 to 68 and a score of 37 or over, indicating that an individual has significant kinesiophobia.³³

The RSES consists of 10 items that measure an individual's self-esteem. It uses a 4-point Likert scale, ranging from strongly agree to strongly disagree. The total score ranges from 0-30, with 30 being the highest score possible. A score of 15 and below indicates low self-esteem, while a score of 15-25 equates to normal self-esteem.³⁴

The NPRS is an 11-point numerical way of quantifying pain as an ordinal variable. Scoring criteria are as follows: 1) 0 = no pain, 2) 1 to 3 = mild pain, 3) 4 to 7 = moderate pain, and 4) 8 and above = severe pain. It would determine the level of pain the athlete is currently experiencing.

Data Gathering Procedure. The primary data gathering will be conducted online. However, if the need arises to meet the recommended sample size, the researchers will gather onsite

data following the researchers' COVID-19 protocol.

Reliability Testing. The researchers ran a pilot test of the Google Forms version of the TSK and RSES questionnaires to 10 participants.³⁵ This was done to check the internal consistency of the online version of the questionnaire if it would measure the same construct as the original questionnaire. The participants' answers will not be included in the data analysis of the association of the study variables.

Data Collection. The study's publication materials containing the study title, objectives, inclusion-exclusion criteria, and Google Forms in QR code or hyperlink will be posted on the researchers' official Facebook and Instagram accounts. The researchers will mainly use Facebook Messenger and Email to communicate with the participants.

The researchers will not choose any particular school, sport, or level of play as long as the participant meets the study's inclusion criteria. The questionnaire will consist of five parts. Part 1 will contain eligibility screening based on the study's inclusion and exclusion criteria for screening participants. Part 2 contains all information about the study, including the research capsule. This will ensure the participants are fully aware of the study details before consenting to participate, thus mitigating the risk of experiencing anxiety and discomfort. Afterward, they will go to the Informed Consent Form (ICF), wherein all statements should be ticked to proceed to the next part; otherwise, they cannot access the rest of the questionnaires.

Part 3 of the questionnaire will be the demographic profile sheet, including sex, type of sport, university, sports team, specific lower extremity injury sustained and injury duration, and the NPRS. Part 4 will contain the TSK, while Part 5 will contain the RSES. After completing the questionnaire, a copy of their answers will be sent to their emails, and a copy of the final paper will also be sent once the research has been published.

The researchers will also gather data onsite to meet the required number of participants. After data collection, the participants will be de-identified as Participant 1, Participant 2, etc.

Letters and soft copies of the researchers' publication material will be provided to school administrations as necessary. Once approved, the researchers will communicate with the team head coach and team captain to schedule the onsite data collection. Those who will participate will use either their gadget or the researchers' to answer the online questionnaire. Proper data gathering, management, and disposal will be done to ensure the participant's privacy and confidentiality. Only the researchers and the UST-CRS Ethics Committee will have access to the gathered data. The data collected will then be disposed of after 5 years from the study's publication date to ensure data privacy.

If emotional distress occurs while answering the questionnaire, the participant may contact the University of Santo Tomas' Counseling and Career Center for Thomasian students or St. Arnold's Center for Integral Development for non-Thomasian students or inform the researchers if a participant seeks professional help. The participants will be given monetary compensation of 100 pesos in cash or GCash.

Data Analysis.

Data will be encoded in a Google Spreadsheet & will be analyzed using IBM Statistical Package for Social Sciences (SPSS) Statistics 22. Frequency and percentage will be used for demographic variables. Mean and standard deviation will be used for interval and ratio data (age, duration of injury, level of pain, TSK score, and RSES score). The average inter-item correlation will be computed to ensure the internal consistency of the online questionnaire with the original version. Alpha was set to 0.5 and interpreted using the following values (0.90-1 excellent, 0.70-0.89 good, 0.50-0.69 moderate, and 0-0.49 low).³⁷

The Shapiro-Wilk test will be conducted to test the normality of data. Spearman rho will be used to determine the association between the TSK score and the other variables. The strength of the association will be interpreted as weak linear relationship (0 to ± 0.3), moderate linear relationship (± 0.3 to ± 0.7), and strong linear relationship (± 0.7 to ± 1.0).³⁸ Values less than 0 indicate an inverse association, while values greater than 0 indicate a linear association.

EXPECTED RESULTS

This study is expected to determine if there is an association between kinesiophobia and the self-esteem of athletes with chronic lower extremity injuries. This will also show the association of kinesiophobia with different demographic factors (sex, type of sport, and type of injury). Athletes are expected to be "mentally tough, fueling the stigma of seeking psychological support." The study's results can help the rehabilitation team and coaches of the athletic teams to include psychological interventions in rehabilitation programs and increase awareness of mental health care of athletes. This will also educate them on the need to consider and include the psychological aspect of the athletes in their athletic program.

Individual author's contributions

K.S., C.N., P.R., supervised the research and provided comments for manuscript revision; K.S., A.A., J.B., M.C., E.D., M.F., N.G., R.L., conceptualized the study and study design, drafted and co-wrote the manuscript.

Disclosure statement

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Conflicts of interest

The authors of this paper declare no conflicting interest.

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