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The Relationships Between Physical Activity Behaviors And Self-perceived Fear And Anxiety Of COVID-19, Psychological Distress, Sleep Disturbance, And Life Satisfaction

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THE RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY BEHAVIORS AND SELF-PERCEIVED FEAR AND ANXIETY OF COVID-19, PSYCHOLOGICAL DISTRESS, SLEEP DISTURBANCE, AND LIFE SATISFACTION

by

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Submitted in Partial Fulfillment of the Requirements for the
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RESEARCH PAPER APPROVAL

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Approved by:

Dr. Philip Anton, Chair

Graduate School
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TITLE: THE RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY BEHAVIORS AND SELF-PERCEIVED FEAR AND ANXIETY OF COVID-19, PSYCHOLOGICAL DISTRESS, SLEEP DISTURBANCE, AND LIFE SATISFACTION

MAJOR PROFESSOR: Dr. Philip Anton

This research study aimed to investigate the correlations between international students' daily physical activity behaviors and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbances, and life satisfaction. The study found a significant weak positive correlation between VIG and FAC, suggesting that as international students engage in more vigorous physical activities, their fear and anxiety related to COVID-19 tend to increase ($r=0.425$, $p<0.05$). Another significant weak negative correlation was found between SIT and FAC ($r=-0.445$, $p<0.01$), indicating that more time spent on daily sitting is associated with lower levels of fear and anxiety related to COVID-19. This study also revealed a strong positive correlation between WALK and MOD ($r = 0.729$, $p < 0.01$), which could suggest that as international students engage more in moderate physical activity, they also tend to report increased levels of walking. Lastly, the results revealed a weak positive correlation between PD and FAC ($r=0.381$, $p<0.05$), indicating that increased fear and anxiety about COVID-19 are associated with higher levels of psychological distress among international students. While this study's findings provide some interesting insights into the correlation of different variables (e.g., VIG, SIT, PD, and levels of physical activity) with FAC, the limited sample sizes restrict the generalization of the results. Thus, future research should prioritize increasing the sample size to ensure more reliable and robust data.

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CHAPTER 1

INTRODUCTION

Background

In an increasingly globalized world, the pursuit of education transcends borders, leading to a diverse influx of students studying abroad. These international students face many challenges, ranging from academic adjustments to cultural adaptation. In addition, there could be negative impacts of the COVID-19 pandemic on international students' overall physical activity behavior. One of the often overlooked aspects of their well-being is their physical activity pattern, which is vital to their overall health and happiness.

The transition to a new country for educational pursuits is marked by a myriad of changes – cultural, social, and environmental. These changes can significantly impact the lifestyles and daily routines of international students. With academic pressures and the excitement of exploring a new culture, maintaining a regular physical activity routine can become challenging. Therefore, understanding the relationship between physical activity patterns and the general well-being of international students is crucial for their holistic development and successful integration into the host society.

This study delves into the intricate interplay between physical activity and the impacts of the COVID-19 pandemic, aiming to shed light on the variations in daily physical activity levels and their effects on psychological distress, sleep disturbance, and life satisfaction. By conducting a simple regression analysis across international students from different cultural backgrounds and educational environments studying in the United States, this research seeks to explore the relationship between the physical activity behaviors of international students and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life

satisfaction.

Statement of Purpose

This study assesses the correlation between international students' physical activity behaviors and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction.

Research Questions

1. What are the correlations between international students' physical activity behaviors and their fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction in this study?
2. Do different levels of physical activity behaviors impact international students' fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction?

Research Significance

This research contributes to the exploration of the correlation between international students' daily physical activity behaviors and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction. If the results follow the patterns seen in prior research, this study should demonstrate that international students' physical activity behaviors are negatively related to their self-perceived psychological distress and sleep disturbance and positively related to their self-perceived life satisfaction. Therefore, this study may be used to promote the importance of daily physical activity behaviors to enhance international students' well-being.

CHAPTER 2

METHODOLOGY

Data Collection

This study will use a survey questionnaire to collect data from international students enrolled in various academic programs at a Midwestern University. Data collection from various academic programs would ensure a diverse and representative sample; efforts will be made to include students from different countries, cultural backgrounds, and academic disciplines. The questionnaire will be administered through an online platform called SurveyMonkey and promoted through the Center of International Education (CIE) of the university. Participants will be informed about the study's purpose, procedures, and confidentiality, and the voluntary nature of their participation will be emphasized. Informed consent will be obtained from all participants.

Participants

Participants will complete the well-developed and publicly available instrument of the 7-item International Physical Activity Questionnaire short form (IPAQ-SF) (Lee et al., 2011) to measure their physical activity behaviors. This questionnaire is designed to provide participants with self-reported separate scores on walking, moderate-intensity, and vigorous-intensity physical activity. Also, a combined score is used to measure participants' overall level of physical activity. For example, participants are asked, "On average, how much time did you spend sitting on a weekday?". Participants are allowed to answer how many hours per day or how many minutes per day. To describe participants' total physical activity behaviors, total scores are all converted into minutes, then categorized into the following three levels of physical activity: inactive, minimally active, or healthy physical activity. Healthy physical activity is

based on exceeding minimum public health physical activity recommendations by the American College of Sports Medicine (ACSM). The ACSM guidelines recommend that at least 150 minutes of moderate-intensity physical activities per week or 75 minutes of vigorous physical activities are considered healthy level of physical activity (Garber et al., 2011).

Participants will also complete another publicly available instrument of the 26-item COVID-19 Fear and Anxiety and Life Satisfaction Model (FALSM) to investigate students' quality of life as related to COVID-19 (Duong, 2021). The FALSM's items are structured to provide measurements on the influences of the fear and anxiety of COVID-19 on life satisfaction (LS), psychological distress (PD), and sleep disturbance (SD). Participants can respond to a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much) for the first 21 items, while the remaining 5 items for life satisfaction range from 1 (strongly disagree) to 5 (strongly agree). Total raw scores can be calculated by summing all the numerical ratings of all 26 items, with the lowest score of 26 and the highest score of 130. These summary scores will also be calculated separately under the categories of COVID-19 fear and anxiety, life satisfaction (LS), psychological distress (PD), and sleep disturbance (SD). A simple regression analysis will be performed, and the scores from this questionnaire will be used as the independent variables to analyze the correlation between these four categories as the outcome variables with the independent variable of physical activity as a predictor variable.

CHAPTER 3

RESULTS

Data Analysis

In this study, we aim to explore the correlation between international students' daily physical activity behavior and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction. Our dependent variable of daily physical activity behavior and independent variables (i.e., fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction) will be analyzed through SPSS Statistical Software. Also, the data analysis results from a simple linear regression analysis will be provided. Statistical analyses, including correlation coefficients, will also be provided. Overall, this study has collected survey data from 33 participants from 17 different countries, which are Brazil, China, England, Ghana, India, Iran, Japan, Malaysia, Mali, Morocco, Nepal, Saudi Arabia, South Korea, Sudan, Taiwan, Thailand, and Turkey. All statistical results were analyzed using the IBM SPSS Statistical Software.

Variables

Dependent/Outcome Variables (Y)

The dependent variable refers to the outcome variables, which in this study refer to the four categories given in the questionnaire designed by Duong (2021) to measure the impact of fear and anxiety of COVID-19 on life satisfaction. There are a total of four independent variables included in this study.

Fear and anxiety of Covid (FAC). This variable is measured using a 5-point Likert scale to assess international students' self-perceived fear and anxiety of COVID-19. The scale is defined as 0 (not at all), 1 (rare, less than a day or two), 2 (several days), 3 (more than 7

days), and 4 (nearly every day over the last two weeks). Figure 1 below represents a histogram that displays the frequency distribution of international students' total scores on the self-perceived fear and anxiety of COVID-19 (M = 1.55, SD = 2.948).

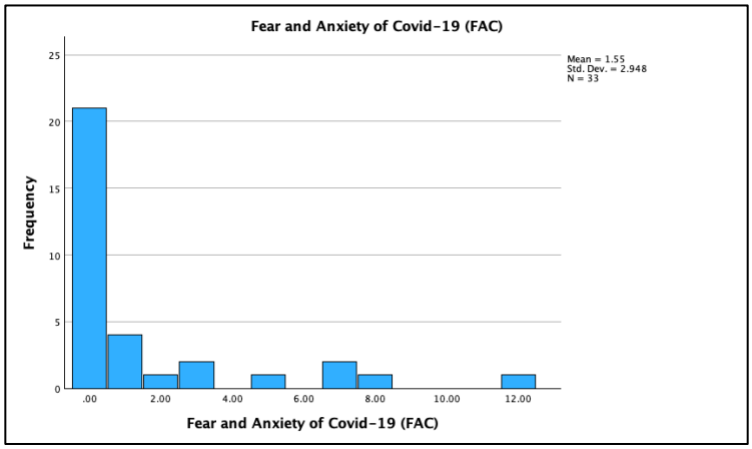

Figure 1. Histogram for Total Scores on Self-Perceived Fear and Anxiety of COVID-19.

Psychological Distress (PD). This variable is measured using a 5-point Likert scale to assess international students' self-perceived psychological distress. The scale is defined as 0 (not at all), 1 (slightly), 2 (moderately), 3 (very), and 4 (extremely). Figure 2 below represents a histogram that displays the frequency distribution of international students' total scores on self-perceived psychological distress (M = 9.00, SD = 6.31).

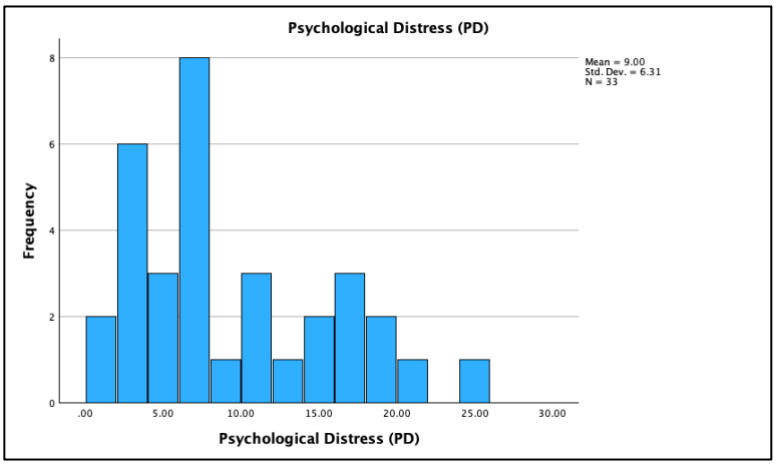

Figure 2. Histogram for Total Scores on Self-Perceived Psychological Distress.

Sleep Disturbance (SD). This variable is measured using a 5-point Likert scale to assess international students' self-perceived sleep disturbance. The scale is defined as 0 (not at all), 1 (slightly), 2 (moderately), 3 (very), and 4 (extremely). Figure 3 below represents a histogram that displays the frequency distribution of international students' total scores on self-perceived sleep disturbance (M = 7.76, SD = 3.26).

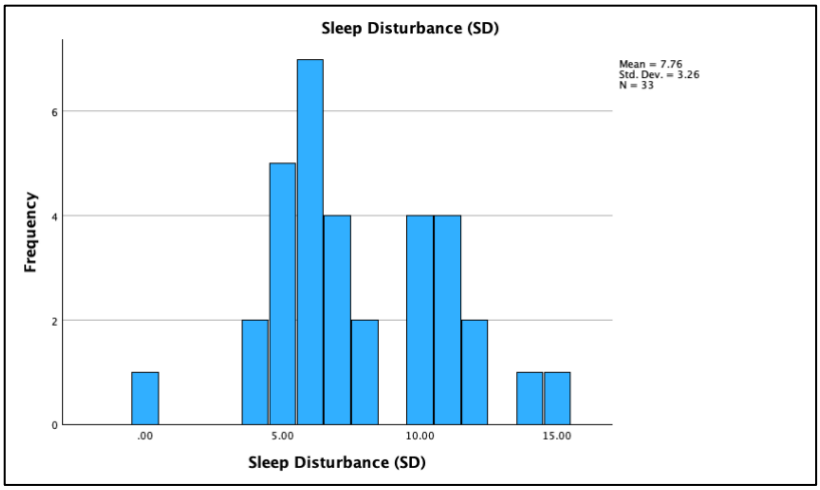

Figure 3. Histogram for Total Scores on Self-Perceived Sleep Disturbance.

Life Satisfaction (LS). This variable is measured using a 5-point Likert scale to assess international students' self-perceived life satisfaction. The scale is defined as 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly disagree). Figure 4 below represents a histogram that displays the frequency distribution of international students' total scores on self-perceived life satisfaction (M = 16.36, SD = 2.793).

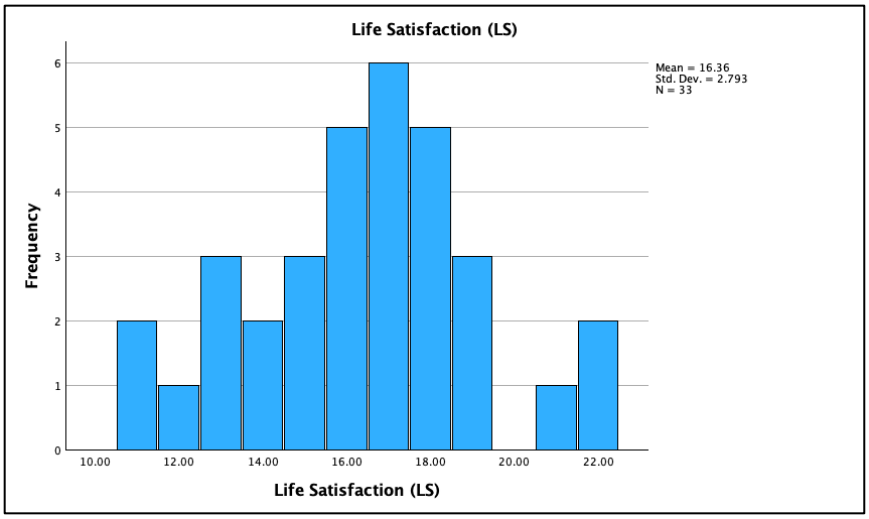

Figure 4. Histogram for Total Scores on Self-Perceived Life Satisfaction

Independent/Predictor Variable (X)

The independent variable refers to the predictor variable, which in this study is the international students' daily physical activity questionnaire by Craig et al. (2017). There are a total of four variables to measure international students' time spent on daily physical activities in the last 7 days when they completed the survey, which are daily vigorous activities, daily moderate activities, daily walking, and daily sitting. Scores are converted to minutes and categorized as inactive (Level 1), minimally active (Level 2), or healthy (Level 3) based on ACSM guidelines. Healthy activity exceeds ACSM recommendations of 150 minutes of moderate or 75 minutes of vigorous exercises per week. Students with no daily activity are inactive, while those below ACSM guidelines are minimally active.

Vigorous Physical Activities (VIG). This variable is measured using a 4-point Likert scale to assess international students' self-perceived vigorous physical activity in the last 7 days. The scale is defined as 0 (no vigorous activities), 1 (1–2 days per week), 2 (3–4 days per week), and 3 (more than 5 days per week). Afterward, the subsequent survey question

investigated the specific number of minutes per day that international students dedicated to vigorous physical activities on any of those days. Figure 5 below represents a histogram that displays the frequency distribution of international students' daily vigorous physical activity (minutes per day) in the last seven days (M = 21.21, SD = 32.74).

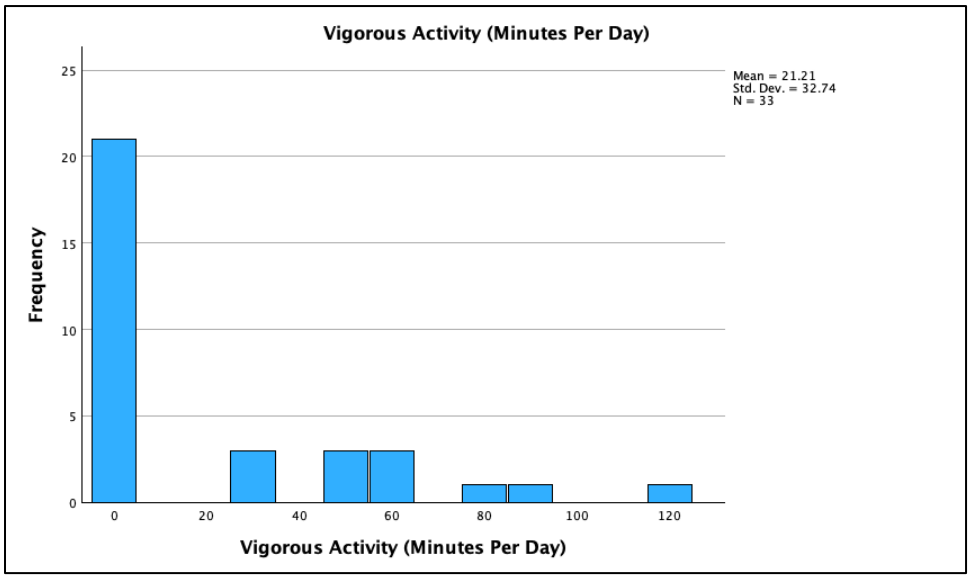

Figure 5. Histogram for Time Spent on Daily Vigorous Activity

Moderate Physical Activities (MOD). This variable is measured using a 4-point Likert scale to assess international students' self-perceived vigorous physical activity in the last 7 days. The scale is defined as 0 (no moderate activities), 1 (1–2 days per week), 2 (3–4 days per week), and 3 (more than 5 days per week). Afterward, the subsequent survey question investigated the specific number of minutes per day that international students dedicated to moderate physical activities on any of those days. Figure 6 below represents a histogram that displays the frequency distribution of international students' daily moderate physical activity (minutes per day) in the last seven days (M = 32.42, SD = 36.166).

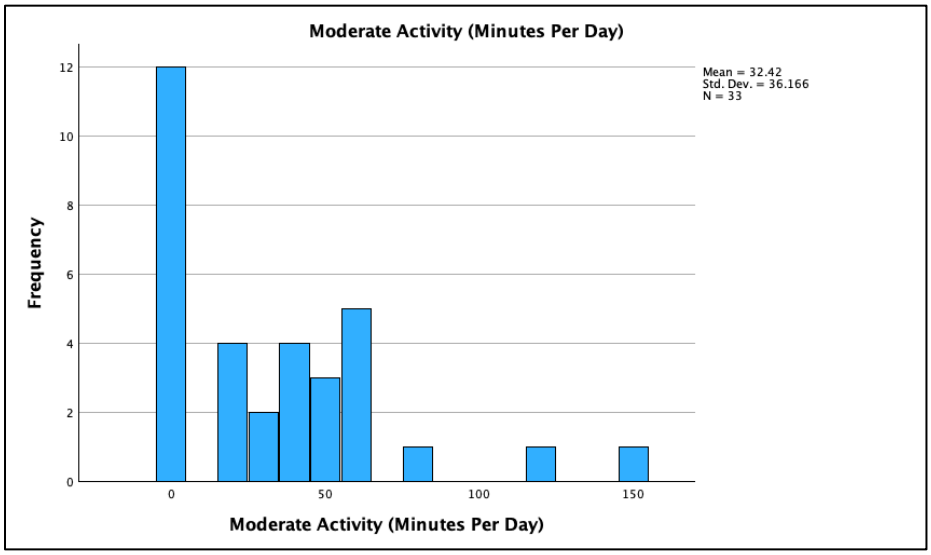

Figure 6. Histogram for Time Spent on Daily Moderate Activity

Walking (WALK). This variable is measured using a 4-point Likert scale to assess international students' self-perceived vigorous physical activity in the last 7 days. The scale is defined as 0 (no walking), 1 (1–2 days per week), 2 (3–4 days per week), and 3 (more than 5 days per week). Afterward, the subsequent survey question investigated the specific number of minutes per day that international students dedicated to walking on any of those days. Figure 7 below represents a histogram that displays the frequency distribution of international students' time spent on daily walking (minutes per day) in the last seven days (M = 47.55, SD = 51.627).

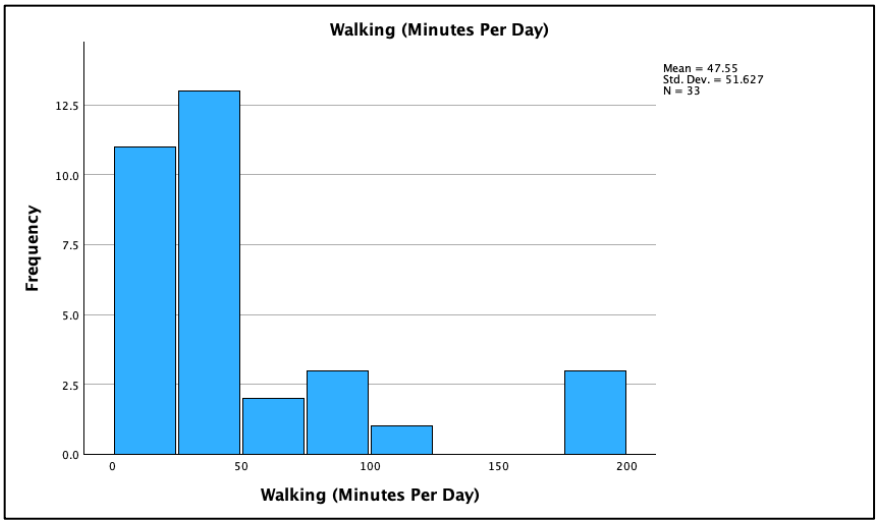

Figure 7. Histogram for Time Spent on Daily Walking

Sitting (SIT). This variable investigated the specific number of minutes per day that international students dedicated to sitting on a typical day at home or work. Figure 8 below represents a histogram that displays the frequency distribution of international students' time spent on daily sitting (minutes per day) in the last seven days (M = 379.09, SD = 223.36).

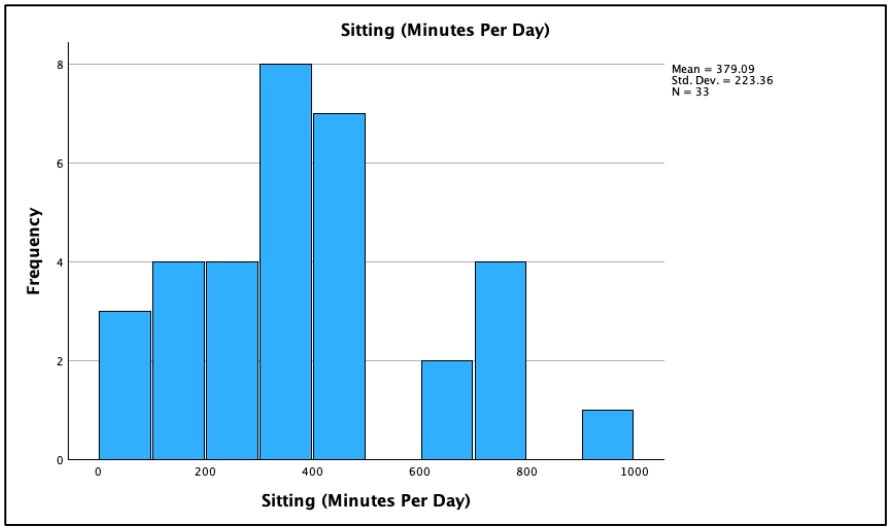

Figure 8. Histogram for Time Spent on Daily Sitting

When converting the daily time spent on physical activities by international students into different categories based on ACSM guidelines, we categorized them as inactive (Level 1), minimally active (Level 2), or healthy (Level 3). Some international students do not clearly meet minimum requirements of daily time spent for both vigorous and moderate activities. By calculating the percentage of time spent on vigorous and moderate activities, we determine if their overall activity level meets the ACSM recommendations of 150 minutes of moderate or 75 minutes of vigorous exercise per week. For instance, if a student spends 45 minutes on vigorous activities (60% of the requirement) and 20 minutes on moderate activities (13% of the requirement), totaling 73% of the minimum, they are classified as Level 2 minimally active. Conversely, if a student spends 50 minutes on vigorous activities (66.67% of the requirement) and 60 minutes on moderate activities (40% of the requirement), totaling 106.67% of the minimum, they are classified as Level 3 healthy.

Descriptive Statistics and Correlation

To answer the first research question, *"What are the correlations between international students' physical activity behaviors and their fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction in this study?",* a correlation table is created (see Table 1) to explore the correlation between four different physical activities behavior and the four categories of international student well-being, which are (1) fear and anxiety of COVID-19 (FAC), (2) psychological distress (PD), (3) sleep disturbance (SD), and (4) life satisfaction (LS). In Table 1, the analysis revealed a weak positive correlation between VIG and FAC ($r= 0.425$, $p<0.05$), indicating that as vigorous physical activity increases, international students tend to report higher fear and anxiety of COVID-19. Conversely, the analysis revealed a weak negative correlation between SIT and FAC ($r= –0.445$, $p<0.01$), indicating that as international students

reported more sitting, they tend to report lower fear and anxiety of COVID-19. In addition, the analysis also revealed the correlation between two dependent variables and two independent variables. For instance, there is a strong positive correlation between the independent variables of WALK and MOD ($r= 0.729$, $p<0.01$), indicating that as moderate physical activity increases, international students tend to report an increase in walking activity as well. Similarly, there is a weak positive correlation between FAC and PD ($r= 0.381$, $p<0.05$), indicating that as fear and anxiety towards COVID-19 increases, international students tend to report an increase in their psychological distress as well.

Table 1

Descriptive Statistics and Correlations for Physical Activity Behavior

Variable	n	M	SD	1	2	3	4	5	6	7	8
1. Vigorous	33	21.21	32.74	–							
2. Moderate	33	32.42	36.17	.106	–						
3. Walking	33	47.55	51.63	–.117	.729**	–					
4. Sitting	33	379.09	223.36	–.117	–.122	.021	–				
5. Fear and Anxiety of Covid-19 (FAC)	33	1.55	2.95	.425*	.081	–.018	–.445**	–			
6. Psychological Distress (PD)	33	9.00	6.31	.110	–.110	–.145	–.186	.381*	–		
7. Sleep Disturbance (SD)	33	7.76	3.26	.099	.152	.124	–.213	.190	.137	–	
8. Life Satisfaction (LS)	33	16.36	2.79	–.020	–.023	–.113	0.081	–.101	–.316	.144	–

**. Correlation is significant at the 0.05 level (2-tailed).*

***. Correlation is significant at the 0.01 level (2-tailed).*

To answer the second research question, ***"****do different levels of physical activity behaviors impact international students' fear and anxiety of COVID-19, psychological distress,*

sleep disturbance, and life satisfaction?", another correlation table is created (see Table 2) to explore the correlation between levels of physical activity (i.e., Level 1 for inactive, Level 2 for minimally active, and Level 3 for healthy) and the four categories of international student well-being, which are (1) fear and anxiety of COVID-19 (FAC), (2) psychological distress (PD), (3) sleep disturbance (SD), and (4) life satisfaction (LS). In Table 2, the analysis revealed a weak positive correlation between levels of physical activity and FAC ($r= 0.355$, $p<0.05$), indicating that as international students' level of physical activity increases, they also tend to report higher fear and anxiety of COVID-19.

Table 2

Descriptive Statistics and Correlations for Levels of Physical Activity

Variable	n	M	SD	1	2	3	4	5
1. Levels of Physical Activity	33	1.88	.781	–				
2. Fear and Anxiety of Covid-19 (FAC)	33	1.55	2.95	.355*	–			
3. Psychological Distress (PD)	33	9.00	6.31	.038	.381*	–		
4. Sleep Disturbance (SD)	33	7.76	3.26	.185	.190	.137	–	
5. Life Satisfaction (LS)	33	16.36	2.79	–.108	–.101	–.316	.144	–

**. Correlation is significant at the 0.05 level (2-tailed).*

As the results in Table 2 shown that there is a weak positive correlation between levels of physical activity and FAC, this study further included a one-way ANOVA test to analyze how different levels of physical activity behaviors (i.e., inactive, minimally active, or healthy) impact international students' fear and anxiety of COVID-19. This study uses a two-tailed distribution

with a significance level of p-value equal to 0.05 for the one-way ANOVA test. Our null hypothesis (H_0) stated that there are no differences between all three groups of international students with different physical activity levels, the alternative hypothesis (H_A) stated that there is a difference between all three groups of international students with different physical activity levels. Since the reported p-value of 0.042 is lower than our selected significance level of p-value equal to 0.05, it suggests statistically significant differences exist between international students' levels of physical activity behaviors and their FAC. We can conclude that there is enough evidence to reject the null hypothesis at the 0.05 significance level and indicates that the predictor variable of different levels of physical activity behaviors (X) has a significant relationship with the outcome variable of FAC (Y). Based on the reported R-squared value, 12.6% of the variability in FAC can be explained by the variability of different levels of physical activity behaviors, and 87.4% of the variability remains unexplained.

CHAPTER 4

DISCUSSIONS

Overview of Findings

This research study aimed to investigate the correlations between international students' daily physical activity behaviors and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbances, and life satisfaction. The results provided several insightful findings on how physical activity levels are associated with various mental and emotional well-being aspects among international students.

Vigorous Physical Activity and Fear and Anxiety of COVID-19

The study found a significant weak positive correlation between VIG and FAC, suggesting that as international students engage in more vigorous physical activities, their fear and anxiety related to COVID-19 tend to increase ($r=0.425$, $p<0.05$). It is commonly known that active physical exercise can improve mental health and relieve stress during COVID-19 (Constandt et al., 2020). A study has shown that physical activity before-, mid-, and end-lockdown were shown to have influences on physical activity habits and behaviors (Maltagliati et al., 2021). Therefore, our counterintuitive finding could indicate that those who are more concerned about COVID-19 after the end-lockdown might engage in vigorous physical activities as a coping mechanism or to boost their immune system. Alternatively, it could reflect a heightened awareness and resultant anxiety among those who are already physically active and thus acting more health-conscious within their daily lives.

Sitting and Fear and Anxiety of COVID-19

Next, a significant weak negative correlation was found between SIT and FAC ($r=-0.445$, $p<0.01$), indicating that more time spent on daily sitting is associated with lower levels of fear

and anxiety related to COVID-19. Past studies have shown that higher fear levels were linked to lower physical activity levels (Cardoso et al., 2023), and higher sedentary time during the pandemic was linked to worsened mental health (Runacres et al., 2021). However, there are studies that found sitting time was negatively related to mental and physical energy (Stamatis et al., 2022). Our study showed a reverse effect, indicating that those who are less active and more sedentary may not be as affected by concerns over COVID-19. This could possibly be due to the post-pandemic era, their different lifestyle priorities, or lower exposure to stressors associated with the pandemic. Future studies could build on this research to explore the negative correlation between time spent sitting and fear or anxiety of COVID-19 in the post-pandemic era.

Walking and Moderate Physical Activity

This study also revealed a strong positive correlation between WALK and MOD ($r = 0.729$, $p < 0.01$). This finding indicates that as international students engage more in moderate physical activity, they also tend to report increased levels of walking. This significant correlation suggests a complementary relationship between these two forms of physical activity, which can be interpreted in several ways. One explanation for this strong positive correlation is that walking and moderate physical activities are often part of a combined routine. Many forms of moderate physical activity naturally include walking as a component. For example, activities such as hiking, brisk walking, and certain sports involve substantial amounts of walking. This integration of walking into other moderate activities could explain the observed correlation.

Another perspective is that students who have active lifestyles may incorporate both walking and moderate physical activities into their daily routines. Walking, being a low-impact and accessible form of exercise, is likely a regular activity for those who are already moderately active. These students might use walking as a primary means of transportation, a break from

sedentary activities, or as a warm-up or cool-down for other exercises. In short, more health-conscious students may intentionally include daily walking to complement with their moderate physical activities for health benefits (Wener & Evans, 2007). Recognizing the health benefits of both forms of exercise, such individuals might consciously integrate more walking into their daily lives to enhance their overall physical activity levels and achieve a balanced fitness regimen.

Psychological Distress and Fear and Anxiety of COVID-19

In both Tables 1 and 2, the results revealed a weak positive correlation between PD and FAC ($r=0.381$, $p<0.05$), indicating that increased fear and anxiety about COVID-19 are associated with higher levels of psychological distress among international students. This aligns with existing literature (Manzoor et al., 2022) that links anxiety related to pandemics with elevated psychological distress. Similarly, the relationship between FAC and sleep disturbance (SD) ($r=0.190$) suggests a trend where increased anxiety and fear contribute to poorer sleep quality, though this correlation was not statistically significant.

Levels of Physical Activity and Fear and Anxiety of COVID-19

In Table 2, the results further revealed a weak positive correlation between levels of physical activity and FAC among international students ($r = 0.355$, $p < 0.05$). This finding suggests that as the physical activity levels of international students increase, their reported fear and anxiety concerning COVID-19 also tend to rise. This counterintuitive result warrants a closer examination of the potential underlying factors and implications. One possible explanation for this positive correlation is that students who engage in higher levels of physical activity may be more health-conscious and, consequently, more aware of the risks associated with COVID-19 (Korn et al., 2013). This heightened awareness could lead to increased fear and anxiety about

contracting the virus, especially if they are more attuned to health-related news and updates.

Thus, their proactive engagement in physical activity might be part of a broader strategy to maintain their health and mitigate perceived risks. Another perspective is that students with higher anxiety levels might use physical activity as a coping mechanism to alleviate stress (Anderson & Shivakumar, 2013). The ongoing pandemic has introduced unprecedented stressors, and physical activity is a well-known method for managing stress and anxiety. In short, those who experience higher levels of fear and anxiety might engage in more physical activities in an attempt to reduce their stress levels, thereby explaining the positive correlation observed.

CHAPTER 5

SUMMARY

Limitations

This study has several potential limitations, including a small sample size and self-report bias. While the findings of this study provide some interesting insights into the correlation of different variables (i.e., VIG, SIT, PD, and levels of physical activity) with FAC, the limited sample sizes restrict the generalization of the results. Thus, future research should prioritize increasing the sample size to ensure more reliable and robust data. In addition, self-report bias indicates that participants may overestimate or underestimate their physical activity levels, fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction scores. For future studies, efforts should be made to mitigate these limitations through transparent survey instructions and appropriate statistical analyses.

Conclusion

In summary, by employing this methodological approach, the study aims to uncover valuable insights into the relationship between international students' physical activity and their self-perceived fear and anxiety of COVID-19, psychological distress, sleep disturbance, and life satisfaction. This study can contribute to a deeper understanding of the factors influencing international students' overall well-being and educational experiences, especially during this post-COVID-19 pandemic recovery season as universities transition from online learning to classroom in-person environments.

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APPENDICES

APPENDIX A

Physical Activity Behavior Questionnaire

Included below is an excerpt of the Physical Activity Behavior Questionnaire used in the current study. For the complete scale, please refer to the following for its publicly open access link:

https://youthrex.com/wp-content/uploads/2019/10/IPAQ-TM.pdf

For more details on the validity and reliability of this questionnaire, please refer to the following article:

> Lee, P. H., Macfarlane, D. J., Lam, T. H., & Stewart, S. M. (2011). Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review. *International journal of behavioral nutrition and physical activity*, *8*, 1-11.

This questionnaire has seven items that assess the intensity of physical activity and sitting time people do in their daily lives for the last seven days. It also requests reports on the time people spend on these activities per week and estimates total physical activity based on the number of minutes people spend sitting per week.

APPENDIX B

COVID-19 Fear and Anxiety and Life Satisfaction Questionnaire

Included below is an excerpt of the COVID-19 Fear and Anxiety and Life Satisfaction Questionnaire, used in the current study, including the test format in 5-point scales. For the complete scale, please refer to the following article:

> Duong, C. D. (2021). The impact of fear and anxiety of Covid-19 on life satisfaction: Psychological distress and sleep disturbance as mediators. *Personality and Individual Differences*, *178*, 110869. https://doi.org/10.1016/j.paid.2021.110869

This questionnaire has four sections: fear and anxiety of COVID-19 (FAC), psychological distress (PD), sleep disturbance (SD), and life satisfaction (LS). All items in FAC have a five-point scale, ranging from 0 (not at all) to 4 (nearly every day over the last two weeks). All items in PD and SD have a five-point scale, ranging from 0 (not at all) to 4 (extremely). All items in LS have a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly disagree).

FAC Items: 5

PD Items: 10

SD Items: 6

LS Items: 5

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