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The Correlation Between Exercise and Burnout in Student Nurses

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Abstract

The national attrition rate for nursing students in Baccalaureate programs in 2021 was approximately 20% with 12% occurring within the first year of beginning nursing classes. One of the reasons for student withdrawing from nursing school has been the high levels of stress/pressure leading to burnout. Reports of burnout caused by workforce stress increased during the COVID epidemic; however, students with developed coping mechanisms had lower levels of burnout. With the strong need for new nurses to join the workforce, identifying interventions to lower attrition rates are important. It is proposed that developing resiliency may decrease feelings of burnout in nursing students. A correlation between exercise and resiliency has been reported. The purpose of this descriptive correlational study was to determine the relationship between exercise and reports of burnout among nursing students. A total of 360 nursing students completed the Demographic data Questionnaire and the Maslach Burnout Inventory (MBI). The scores were correlated to determine if there was a relationship between exercise rates and scores on the MBI for measurement of burnout. This study found that emotional exhaustion, depersonalization, and total burnout were significantly correlated to exercise. Total burnout decreased in students who did not exercise at all and those who exercised the most. The moderate exercise groups had the worst total burnout scores. Recommendations for future studies include improving operationalization of exercise by leaving the question open ended so participants can report exactly how many hours a week they exercise, as well as to define different types of exercise to be studied.

The Correlation between Exercise and Burnout in Student Nurses

In 2022, the American Association of Colleges of Nursing (AACN) reported a significant registered nurse shortage with a loss of over 100,000 nurses in 2021. They predict the shortage will increase due to the aging Baby Boomer population, the loss of nurses during COVID, and increases in burnout after COVID (AACN, 2022).

Burnout among nurses has been identified as a major contributing factor to this nursing shortage (Trade Schools, 2022). Maslach (1996) defines burnout as “fatigue at the very idea of work, chronic fatigue, trouble sleeping, physical problems [and] symptoms of depression” (p. 1). He also summarizes burnout symptoms under three categories: emotional exhaustion, depersonalization, and low personal accomplishment.

Exercise has been proposed as a solution to improve symptoms of burnout. Romani and Ashkar (2014) found that exercise and stretching at work reduces two components of burnout: emotional exhaustion and feelings of depersonalization in healthcare workers. Chen et. al.’s (2022) examined college students and reported a positive correlation between amount of exercise and feelings of personal accomplishment. Due to the literature supporting that exercise positively impacts these three symptoms of burnout, exercise is suggested as a possible intervention to reduce burnout.

It follows that if nursing students are educated about burnout prevention strategies prior to entering the workforce it may minimize the loss of nurses due to burnout. Unfortunately, nursing school retention has been an issue over the past few years as nursing students are experiencing burnout from nursing school. Trade Schools (2022) reported that approximately 12% of new graduate nurses left nursing during their first year of work last year, and 20% of nursing students dropped out of associate degree nursing programs this past year. Morris, (2022)

reported that some of the reasons for nursing student attrition include ignoring self-care and feeling overwhelmed. Additionally, Eiko et. al. (2006) completed a study of 20 university hospitals surveying 1,203 new nurses about the causes of novice nursing turnover. They found that new nurses reported that the main causes of new graduate nursing turnover were burnout, poor job satisfaction, life stressors, and individual characteristics.

Literature Review

Exercise is a proposed strategy to reduce feelings of burnout in nursing students, and it may be a useful educational tool to help nursing students prevent burnout once they begin working. Research has focused on the effects of exercise on three components of burnout including emotional exhaustion, depersonalization, and low personal accomplishment to determine a participant's level of burnout.

Emotional Exhaustion

Maslach (1996) defines emotional exhaustion, as “fatigue at the very idea of work, chronic fatigue, trouble sleeping, and physical problems” (p. 1). There is evidence in literature of the relationship between emotional exhaustion and exercise (Taylor et al., 2022; Romani & Ashkar, 2014).

In a systematic review, Taylor, Scott, and Owen (2022) reviewed 18 papers to determine the relationship between exercise and emotional exhaustion. Inclusion criteria included studies which focused on burnout among college and higher education students. They used Maslach's definition of burnout and reported that as physical activity increased, total burnout and emotional exhaustion scores decreased.

Romani and Ashkar (2014) conducted a systematic review of 15 experimental studies to determine the effects of exercise and stress management classes on emotional exhaustion of

healthcare professionals. This review found that a 10-min stretching exercise during work was correlated with lower anxiety and emotional exhaustion symptoms. Additionally, the more a healthcare professional engaged in aerobic exercise, the lower their depression scores.

Depersonalization

As defined by Maslach (1996), depersonalization is when “the notion of detachment is excessive, leading to cynicism with negative attitudes in regard to colleagues, feeling of guilt, avoidance of social contacts, and withdrawing into oneself” (Maslach, 1996, p. 1). There is also literature reviewing the relationship between depersonalization and exercise (Friganovic et al., 2019; Romani and Askars, 2014, and Vinnikov et al., 2021).

Friganović et. al. (2019) completed a systemic review of the literature focused on the depersonalization’s effects on stress, burnout, coping mechanisms, and job satisfaction reported by intensive care (ICU) nurses. They defined depersonalization as occurring when healthcare workers “treat patients indifferently, objectify them, and develop a negative attitude toward their colleagues and profession” (p. 1). A negative view towards colleagues was emphasized as a part of depersonalization. The review included 24 quantitative studies, 22 cross-sectional studies, two longitudinal studies, and five qualitative studies published from 2002-2018. They reported findings of the studies indicated that increased work demands, which lead to burnout for ICU nurses, were correlated to high rates of depersonalization.

Romani and Ashkar’s (2014) analyzed the effects of exercise on depersonalization. A systematic review of 15 experimental studies found that aerobic exercises for two or three days every week were associated with decreased episodes of depersonalization in healthcare workers. These exercised were shown to improve the mental and physical health of healthcare providers by reducing depersonalization and anxiety episodes.

Vinnikov et. al. (2021) examined burnout and lifestyle habits of medical staff from Kazakh Research Institute of Oncology. A total of 256 participants completed questionnaires that measured demographic characteristics, exercise, and lifestyle habits. Participants also completed the Maslach Burnout Inventory (MBI). Results revealed that medical professionals who incorporated exercise into their lifestyle had lower scores of depersonalizations on the MBI. Therefore, it can be suggested that exercise helps lower feelings of depersonalization in medical professionals.

Personal Achievement

According to the Maslach (1996), lack of personal achievement is defined as when “the individual assesses themselves negatively or feels they are unable to move the situation forward” (p. 1). There is evidence of a relationship between personal achievement and exercise in the literature (Low et al., 2019; Chen et al., 2022).

Low et. al. (2019) conducted a meta-analysis of 11 studies using the random effects model to calculate prevalence of burnout among all healthcare medical residents, physicians, and nurses. This analysis included a total of 22,778 healthcare staff members. They found that over half of healthcare participants experienced symptoms of burnout including feelings of low personal achievement, using results from the MBI. Among the various professions, there were no significant differences in prevalence of burnout. However, responses suggested that some of the largest challenges to personal achievement among healthcare professionals included poor work-life balance.

Chen et. al. (2022) conducted a cross-sectional survey of 1,270 college students in China, including nursing students, to determine the relationship between physical exercise, feelings of personal achievement, and burnout. Physical exercise was defined as “physical activity that is

accomplished at a certain intensity, frequency, and duration with the aim of benefitting physical and mental health (p. 2).” Their study used three measures: the Physical Activity Rating Scale to measure exercise, Academic Burnout Scale for College Students to measure burnout, and the 10-item General Self-Efficacy Scale to measure personal achievement. There was a statistically significant positive relationship between physical exercise and feelings of personal achievement. As physical exercise increased, participants experienced higher personal achievement. The authors concluded that when participants exercised more often, they had higher personal achievement.

Due to the predicted nursing shortages, interventions to reduce burnout rates and hopefully lower attritions rates need to be identified and implemented. Exercise has been shown to be related to lower levels of burnout and specifically less emotional exhaustion and depersonalization, and greater sense of personal accomplishment. Previous studies demonstrated how exercise may reduce feelings of poor personal achievement and burnout for college and specifically nursing students. Educating nursing students about exercise may be a positive method to cope with burnout in the nursing profession.

The purpose of this study was to determine the correlation between exercise and feelings of burnout among nursing students. It was hypothesized that higher exercise levels would reduce emotional exhaustion, higher exercise would reduce depersonalization episodes, higher exercise would improve feelings of personal achievement, and higher exercise would reduce total burnout scores.

Methods

A non-experimental design was used to determine the relationship between exercise and feelings of burnout reported by nursing students. Approval for the study was obtained from the

Institutional Review Boards of Tennessee Graduate School of Medicine and the University of Tennessee Medical Center. All subjects consented to participate before completing any surveys. This study was part of a larger study concerning the effects of emotional intelligence on burnout in nursing students.

Sampling Plan

Convenience sampling was used to obtain participants from junior nursing class from a traditional baccalaureate nursing program in Eastern Tennessee. All nursing students who answered the demographic question regarding exercise habits were included.

Procedure and Measures

The Demographic Data Questionnaire and Maslach Burnout Inventory were administered to participants before beginning their junior level medical-surgical class. All students were separated from one another while completing the survey in a large classroom and were monitored by a researcher involved in this study. Respondent confidentiality was ensured by assignment of a random identification number for participants.

Demographic Questionnaire and Exercise

The Demographic Data Questionnaire measured age, gender, nursing program currently enrolled, exercise habits, semester in nursing school, marital status, length of relationship, and dependents. Optional demographics included if burnout or emotional intelligence was addressed in their curriculum, parental healthcare profession status, spirituality, exercise habits, wellness strategies, and anxiety status. Exercise was measured with one item included on the Demographic Questionnaire. The four-point scale responses were “not at all,” “about 2 times a week,” “3-4 times a week,” and “>4 times a week.”

The Maslach Burnout Inventory (MBI)

The MBI is a 22 question 7-point Likert scale questionnaire addressing three components of burnout. These components included emotional exhaustion, depersonalization, and low personal accomplishment. The questions ask about personal feelings and ranged from 0, “never,” to 6, “every day.” It took approximately 10-15 minutes for students to complete. Higher total scores indicated higher degrees of burnout. Internal consistency of this scale was determined using Cronbach’s coefficient alpha. Reported reliability coefficients in the literature were: 0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.71 for personal achievement (Maslach, 1996). Test-retest reliability was ensured with coefficients of 0.82 for emotional exhaustion, 0.60 for depersonalization, and 0.80 for personal accomplishment (Maslach, 1996). In this study, the Cronbach’s alpha for internal consistency were 0.92 for emotional exhaustion, 0.83 for personal achievement, and 0.66 for depersonalization. A limitation of Cronbach’s alpha for depersonalization was that only five items were summed up for this score. There was no reported validity.

Analysis

The analysis was conducted using Statistical Package for Social Sciences (SPSSx). The level of significance for testing the hypothesis was $p \leq 0.05$. Descriptive statistics were calculated for each of the items and the total scores for the MBI. To test the hypothesis, an ANOVA was calculated using the four categories of exercise. Prior to analysis, all negatively worded items on the MBI were re-coded. Eighty-six students’ responses were collected and analyzed.

Sample Characteristics

The ages of the sample ranged from 20 (n=53) to 22 (n=1). Most students were 20 years old. All but two participants were female, and 62% (n=54) were reported being single. The other 38% (n=32) reported being in relationships.

Exercise

Most (n=86, 68%) junior level nursing students participated in moderate levels of exercise. Of the 86 subjects, 12% of students (n= 10) reported that they do not exercise at all, 32 % (n=27) reported working out about 2 times a week, 37 % (n=31) reported working out 3-4 times a week, and 20 % (n=17) reported exercising over four times a week.

Emotional Exhaustion

Eight items were used to determine emotional exhaustion. Scores of 0-16 are considered low emotional exhaustion, 17-26 moderate exhaustion, and 27 and higher indicated high emotional exhaustion. Scores on the subscale ranged from 0-50, $X = 24.41$ (s.d. = 11.9). The mean value of 24.41 on emotional exhaustion scores reveals that most junior level nursing students experienced moderate levels of emotional exhaustion.

Depersonalization

Five questions on the MBI were used to measure depersonalization. Scores of 0-6 are considered low levels of depersonalization, 7-12 moderate depersonalization, and 13 and higher are considered high depersonalization. Depersonalization scores ranged from 0-23, $X = 6.9$ (s.d. = 5.3). The mean value of 6.9 scoring reveals that most junior level nursing students experienced low to moderate levels of depersonalization.

Personal Achievement

Eight items were used to determine personal accomplishment. Scores of 0-31 are considered low personal accomplishment, scores of 32-28 are considered moderate

accomplishment, and scores of 39 and higher are considered high personal accomplishment.

Results for personal accomplishment ranged from 14-48, $X=33.56$, $s.d. = 2$).

Total Burnout

Students who score high on either emotional exhaustion or depersonalization and score low on personal achievement are considered to have burnout. Also, students who score high on all three subscales are considered to have burnout. A score of 42 and above is considered to be burnout. Results for total burnout ranged from 29-102, $X= 65$ ($s.d= 15.8$).

Table 1

Correlations of Exercise with Burnout and its Subscales

	Exercise Responses	N	Mean	F	P
Emotional Exhaustion	"not at all"	10	19.9	2.75	0.048
	"2x a week"	27	26.41		0.048
	"3-4x a week"	31	27.23		0.048
	">4x a week"	17	18.76		0.048
Depersonalization	"not at all"	10	3.5	5.043	0.003
	"2x a week"	27	8.96		0.003
	"3-4x a week"	31	7.74		0.003
	">4x a week"	17	4.29		0.003
Personal Achievement	"not at all"	10	31.9	0.224	0.879
	"2x a week"	27	34.26		0.879
	"3-4x a week"	31	33.61		0.879
	">4x a week"	17	33.35		0.879
Total Burnout	"not at all"	10	55.3	4.778	0.004
	"2x a week"	27	69.63		0.004
	"3-4x a week"	31	68.58		0.004
	">4x a week"	17	56.41		0.004

Hypothesis 1

The first hypothesis tested was that emotional exhaustion would be higher in people who exercise less. To determine the differences in emotional exhaustion, an ANOVA was calculated to determine if there was a difference in scores based on the four categories of exercise. There was a statistically significant difference between the four groups ($f= 2.75, p= 0.048$). The group that reported exercising over four times a week had the lowest emotional exhaustion scores, as seen in figure 1, followed by the students who reported not exercising. The students who reported exercising 2 times a week and 3-4 times a week had the highest emotional exhaustion scores.

Hypothesis 2

The second hypothesis was that depersonalization scores would be higher in people who exercise less. An ANOVA was run to calculate the differences between the four categories of exercise. As seen in figure 1, there was a statistically significant difference between the four groups. The group that reported not exercising at all had the lowest depersonalization scores, followed by the group who exercised over four times a week. Once again, students who exercised 2 times a week and 3-4 times a week reported the highest depersonalization scores.

Hypothesis 3

The third hypothesis was that personal achievement scores would be higher in people who exercise more. An ANOVA was run to calculate the differences in personal achievement scores of the four exercise categories. There was not a statistically significant difference between these four categories. Students in all four categories of exercise reported moderate levels of personal achievement.

Hypothesis 4

The fourth hypothesis was that total burnout levels would be higher in students who exercised less. An ANOVA was run to calculate the differences of total burnout in all four exercise categories. There was a statistically significant difference between all the groups as shown in figure 1. The group who did not exercise at all had the lowest burnout scores followed by the group who exercised the most. Both middle groups for exercise had the highest rates of burnout.

Results and Discussion

The results of this study did not support the previous literature that increasing physical activity reduces burnout. Chen et. al. (2022) reported that as exercise increases, burnout scores decrease. One possible reason for the differences would be the measurement of exercise. Exercise is a much more complex activity than just the number of days as you do not account for time or level of exercise activity. Chen et. al. used the Physical Activity Rating Scale to measure exercise, which measured types of exercise and overall activity level over the past 6 months.

Personal achievement scores were not significantly related to number of days of reported exercise. Furthermore, both the groups that exercised the most and the least scored the lowest in burnout, emotional exhaustion, and depersonalization. The two groups of moderate exercise consistently scored the highest total burnout and on the three subscales. One possible explanation for these results is that the group that did not exercise at all had more time in the week to get tasks done: therefore, preventing burnout due to less of a time constriction. Additionally, the group who exercised the most could have less burnout due to strict routines which allow them to complete their required weekly tasks including exercising. The two middle groups may be lacking in both sufficient time and organizational skills required to prevent burnout.

Possible confounding variables may have also affected results. An additional t test was calculated to determine if there was a difference in total burnout or each of the subscales when students reported being in a relationship versus being single. There were no differences in burnout between those who reported being in a relationship and those being single. Therefore, relationship status does not appear to impact burnout scores among nursing students. Other possible confounding variables that were not measured include type of exercise, intensity of exercise, and overall health.

There were limitations to this study which should be considered in future research. A major limitation was the operationalization of exercise. Exercise was measured with only one 4-point item and may not accurately reflect the amount of physical activity. Additionally, “physical activity” was not properly defined before administering the survey. Therefore, respondents were free to interpret anything from walking to class to rigorous weightlifting. This limited the accuracy of physical activity data and future studies should include not only the number of days, but amount of time spent and the level of intensity. Additionally, future studies should consider defining physical activity to respondents prior to administering the survey. Identifying outside variables such as overall health ought to be considered for future studies as well by including them in the demographic questionnaire.

Another limitation is convenience sampling and limits the ability to generalize results beyond the sample. Replicating the study with other nursing students across the state and country using the MBI and the Physical Activity Rating Scale would increase the external validity. Lastly, future studies should measure burnout in the middle of the semester. In this study, burnout was measured at the beginning of the semester after a six-week break which may have reduced burnout scores reported.

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