

Mindfulness Meditation Versus Physical Exercise in the Management of Depression Among Nursing Students

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ABSTRACT

Background: Depression among nursing students is an ongoing problem. Several psychotherapies have been suggested as alternatives to antidepressants in the management of depression. The aim of this randomized controlled study was to compare the effectiveness of mindfulness meditation versus physical exercise in the management of depression among nursing students. **Method:** A sample of 181 soon-to-graduate nursing students participated in the study and were assigned at random to one of two therapies: physical exercise ($n = 90$) or mindfulness meditation ($n = 91$). The Center for Epidemiologic Studies Depression Scale was completed by the participants in both groups prior to the therapies and after completion. **Results:** The findings indicated that both therapies were effective in the management of depression. However, mindfulness meditation is more effective than physical exercise. **Conclusion:** Mindfulness meditation is recommended over physical exercise in the management of depression among undergraduate nursing students. [*J Nurs Educ.* 2017;56(10):599-604.]

Depression disorder is a disturbance of mood, leading to a state of sadness, low self-esteem, guilt, sleep disturbance, and change in appetite (Fry, 2016). Depression is associated with increased morbidity and mortality, including a higher rate of attempted and completed suicide (Peltzer, Yi, & Pengpid, 2017). The disorder is also associated with decreased quality of life (Kolovos et al., 2017) and increased health care and work-related cost (Hallgren et al., 2017). It is estimated that 15% of the total population of the world experiences various degrees of depression (Hallgren et al., 2017). Studies report that depression is considered a major impetus for suicide among university students (Peltzer et al., 2017), and increases the risk of substance abuse (Bravo, Pearson, & Henson, 2017).

Studying is considered an exhausting experience for nursing students (Cheung et al., 2016; Patterson, 2016), and stress from study overload and the heavy requirements of undergraduate education may result in depression and anxiety (Dubert, Schumacher, Locker, Gutierrez, & Barnes, 2016; Smith & Yang, 2017). Studies report a high prevalence of depression among nursing students worldwide, such as in China (Chen et al., 2015), Turkey (Yildirim, Karaca, Cangur, Acikgoz, & Akkus, 2017), and Hong Kong (Cheung et al., 2016). In the past, 24.3% of nursing students reported severe depressive symptoms.

Few studies have investigated depression among university students in Jordan. One exception, by Alorani and Alradaydeh (2017), reported that 56% of the university students have mild to severe signs and symptoms of depression. Jordanian students experience several stressors in academic life that put them at risk of depression, including academic performance, transition into a new environment, financial difficulties (Alorani & Alradaydeh, 2017), and lack of spiritual well-being (Musa, 2015). Depression has an influence on academic performance (Alorani & Alradaydeh, 2017), perpetuates aggression (Alorani & Alradaydeh, 2017), and encourages substance abuse among students (Al-Zboon & Al-Dababneh, 2017; Mauseth, Skalsky, Clark, & Kaffer, 2016). Al-Zboon and Al-Dababneh (2017) reported that depression was the second most common cause of substance abuse among university students, with substances including alcohol and illicit substances. The same study reported a lack of psychiatric counseling or treatment for depression on

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The authors have disclosed no potential conflicts of interest, financial or otherwise.

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Received: December 27, 2016; Accepted: April 25, 2017

doi:10.3928/01484834-20170918-04

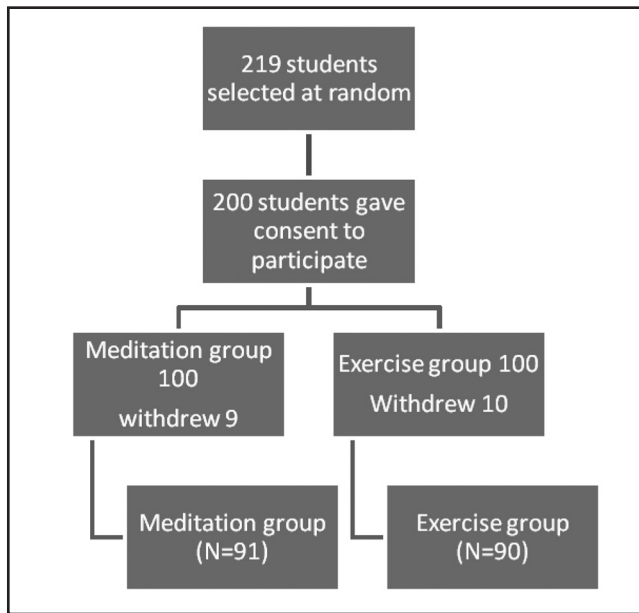


Figure. Sampling procedures.

the university campus. Early identification and management of depression facilitates students' learning, and enhances professional development and competence in the future (Guo et al., 2016; Roso-Bas, Jiménez, & García-Buades, 2016). Thus, the purpose of the current study was to compare the effectiveness of mindfulness meditation with exercise in the alleviation of depression.

BACKGROUND

Antidepressants are commonly used in the treatment of depression (Vedana, Magrini, Miaso, Zanetti, & Borges, 2017), although their use is associated with devastating side effects that may prevent compliance with the therapeutic regimen (Rheker, Winkler, Doering, & Rief, 2017). Some patients reported worsening signs and symptoms of depression after using the prescribed antidepressants (Shankman et al., 2017), and an increased risk of mortality and morbidity also exists (Nelson & Spyker, 2017). The evidence-based guidelines for treatment of depression include both pharmacologic and nonpharmacologic modalities. Such nonpharmacologic modalities include mindfulness meditation and physical exercise.

Mindfulness meditation is a nonpharmacological modality that includes several techniques (Course-Choi, Saville, & Derakshan, 2017), including mindfulness walking, mindfulness breathing, and mindfulness body scan, and is considered an effective therapeutic technique in the reduction of depression (Hoge et al., 2017; Morone, Moore, & Greco, 2017).

Similarly, physical exercise is considered as a nonpharmacological treatment for depression (Hallgren et al., 2017). Touns et al. (2017) reported that depression was significantly reduced among participants who performed physical exercise, compared with others who did not. This finding is supported by Bewernick, Urbach, Bröder, Kayser, and Schlaepfer (2017), who re-

ported that physical activity improves mood and helps in the alleviation of depression.

In Jordan, as in other countries in the Middle East, mental health has long been associated with social stigma (Findley, 2016). Studies reported psychological disturbances and social conflict among families who have members with psychiatric disorder. This social stigma causes people to deny the need for psychiatric evaluation and to refrain from seeking psychiatric treatment (Al Ali, Alqurneh, Dalky, & Al-Omari, 2017; Dardas, Silva, Noonan, & Simmons, 2016). Several factors affect people's attitudes toward mental health. Those who are more likely to seek psychiatric assistance tend to be of higher socioeconomic status and higher education (Dardas, Bailey, & Simmons, 2016). However, Middle Eastern university students have been found to show more sensitivity regarding psychiatric counseling, less openness to speak about psychiatric illness, less recognition of personal psychiatric needs, and a greater tendency to believe in the traditional healing that is inherent in their culture (Dardas, Silva et al., 2016).

Although both exercise and mindfulness meditation have been supported as effective interventions for depression among undergraduates, little is known about which intervention is superior. Thus, the aim of this study was to evaluate the level of depression among nursing students and to compare the effectiveness of mindfulness meditation with physical exercise in the management of their depression among them.

METHOD

Design

This study was an experimental, randomized, controlled study. A pretest–posttest survey was used to compare the effectiveness of meditation therapy and physical exercise in the management of depression among nursing students.

Sample Size Determination and Sampling Technique

G*Power software was used to calculate the required sample size for this study, based on an estimated medium effect size of 0.5, $\alpha = .05$, power = .95. To run two groups with an independent sample *t* test, the required sample size was determined to be 176 (88 participants in each group).

A simple random sample technique was used to recruit participants. A list of all nursing students was obtained from the administration, and 219 were selected using a random number generator. Of these, only 200 students were willing to participate in the study. Students were then assigned at random, using computer software, to either the meditation group or the control group. Ten students from the exercise group and another nine from the meditation group dropped out, ending with a sample size of 181 (90 in the exercise group and 91 in the meditation group). The **Figure** shows the sampling procedures.

Setting

The study took place in a public university in Jordan. The university was chosen because it has facilities that fit the physical exercise and meditation session requirements. The exercise sessions were held in the indoor volleyball court of the university. The court is 25 meters long by 15 meters wide and is

equipped with air conditioning and adequate lighting. The temperature was maintained at 18°C to 20°C, with 50% humidity. The meditation sessions were held in a separate room that was quiet, clean, and away from noise. The room was 20 meters by 20 meters, with windows to let in natural light, scented with jasmine, and maintained at a constant temperature of 18°C. It was painted white, had no distracting furniture, and was equipped with mats and pillows for the meditation sessions.

Data Collection

Information about the study was given to students in their classrooms. None of the authors in this study were actively engaged in teaching these students. Students who agreed to participate were sent to a registration office then randomly assigned to either the exercise group or the meditation group. On the day of the pretest, the researchers submitted the questionnaire to the participants individually. The posttest was submitted after completion of the interventions in each group. Both pretest and posttest were completed by the participants themselves. Although the focus of the study was to compare meditation with exercise in the alleviation of depression, all students were invited to participate in the study to improve the participation rate and to discourage dropout that might arise as a result of the social stigma related to depression. It was also to encourage the students to provide honest responses in both the pretest and posttest.

Data were collected over a 3-month period from August to November 2016. On the first day of the study, a presentation was given. Students were informed that the aim was to evaluate their level of depression and to compare the effect of mindfulness meditation with exercise in its alleviation. They were told that they could withdraw from the study at any time. After completion of the pretest, the students were guided to the exercise and meditation locations.

The 1-hour exercise classes took place 3 days per week over 10 weeks. The exercises were of three types: stretching for 20 minutes, followed by 20 minutes of aerobics, and then another 20 minutes of strength exercises. Stretching included 2 minutes each of running, a standing side-stretch, forward hanging, and low lunges, and 1 minute of bound angle stretch. A break of 2 minutes was given between two sets. Aerobic exercises included 2 minutes each of rope jumping, bunny hop (a jump forward in a crouched position), and lateral bounding, and 3 minutes of jumping jacks. The aerobic exercise was repeated, with a 2-minute break between the two sets. Strength exercises included push-up exercises for 2 minutes, squat exercises for 4 minutes, plank exercises with a T-rotation for 2 minutes (1 minute for each side), and reverse lunge with front twist for 2 minutes. A 1-minute break was given between each minute of exercise.

The mindfulness meditation classes were also 1-hour sessions for 3 days per week over 10 weeks. Each session contained three different techniques: 20 minutes each for mindfulness breathing, mindfulness body scan, and mindfulness walking. During the breathing section, participants were instructed to assume a sitting position, breathe naturally, and focus their attention on inhalation and exhalation. During the walking section, they went back and forth between two points that were

TABLE 1
Participants' Baseline Characteristics (N = 181)

Characteristic	n (%)
Gender	
Male	69 (38%)
Female	112 (62%)
Academic year	
First	23 (12%)
Second	45 (25%)
Third	70 (39%)
Fourth	43 (24%)
Marital status	
Single	179 (99%)
Widowed	2 (1%)
Employment	
Employed	6 (3%)
Not employed	175 (97%)

10 meters apart, starting slowly for 5 minutes, then slower for another 5 minutes, and quite slow for the rest of the time. During the mindful body scan section, they were instructed to sit on a mat, cover themselves with a blanket, and rest their head on a pillow, then sweep their whole body with awareness from top to bottom and to notice feelings such as pain, nonacceptance, or tension in any part. The principal investigator (F.A.A.), who has mindfulness meditation expertise, guided these sessions. A report summarizing the activities was made after each meditation and exercise session to ensure consistency.

Instrument

The Center for Epidemiologic Studies Depression Scale (CESD-R) was used to measure depression among the students before and after the intervention for both groups. The CESD-R, developed by Radloff (1977), is one of the most popular instruments in the field of psychiatric and mental health (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). It has good internal consistency (Cronbach's $\alpha = .85, -.90$), and test-retest reliability (.45, $-.70$). Validity was established by correlation with the Hamilton Clinician's Rating Scale and the Raskin Rating Scale (Radloff, 1977). No permission was required to use the CESD-R. The original English version was used in this study. Translation for the CESD-R was not needed, as the language of education for nursing students in Jordan is English.

Ethical Considerations

The institutional review board at Mutah University approved this study. Each participant gave written agreement to take part. A master code list of students' numbers and codes was created. Each participant was provided with a code to match the pretest and posttest results, and the students were instructed to use only their codes to maintain confidentiality. Data were secured on the

TABLE 2**Pretest and Posttest Results of the Meditation Group
(*n* = 91) and the Exercise Group (*n* = 90)**

Variable	Students' Mean Score (<i>SD</i>)	<i>t</i>	<i>p</i>
Pretest scores (overall)	31.3 (13.2)		
Meditation	32.0 (13.5)	-1.4	.15
Exercise	33.3 (11.2)	—	—
Posttest			
Meditation	19.7 (22.3)	5.2	.00
Exercise	29.1 (12.9)	—	—
Within each group			
Meditation pretest	32 (13.5)	-4.3	.00
Meditation posttest	19.7 (22.3)	—	—
Exercise group pretest	33.3 (11.2)	2.9	.05
Exercise posttest	29.1 (12.9)	—	—

principal investigator's personal laptop, and only the principal investigator had access to the electronic and hardcopy data. All materials regarding the study were discarded after completion of the research.

Data Analysis

Data were analyzed using SPSS® version 21 software. Frequency analysis was conducted to investigate the baseline characteristics of the participants. An independent sample *t* test was conducted to compare the pretest and posttest depression scores between the exercise and meditation groups. A paired-sample *t* test was conducted to detect the change in depression scores from the pretest to the posttest within each group.

RESULTS

This study was a randomized controlled trial with a sample of 181 students. The majority of participants were women (62%), and the mean age was 22 years (*SD* = 2.1). **Table 1** summarizes the baseline characteristics of the participants. The overall mean depression score for the whole group pretest was 30.5 (*SD* = 13.2).

Pretest and Posttest Depression Scores

For the pretest, no statistical difference existed in depression scores between the mindfulness meditation group and the physical exercise group, *t* (179) = -1.4; *p* = .15. For the posttest, both groups showed a significant decrease in depression scores; however, participants in the mindfulness meditation showed significantly more alleviation in their depression score than the physical exercise group, *t* (179) = 5.2; *p* = .00. **Table 2** shows the changes from pretest to posttest.

DISCUSSION

To best of the authors' knowledge, and per a literature review, this is the first study to evaluate depression among nursing students in Jordan. The aim of this study was to compare the effectiveness of mindfulness meditation with physical exercises in the alleviation of depression among nursing students. Both had a significant effect in reducing the symptoms of depression; however, the meditation was more beneficial than the exercise. These findings support those of previous studies that indicate the beneficial use of both physical exercise (Hallgren et al., 2017; Schuch et al., 2016) and meditation in the management of depression (Aggarwal, Sharma, & Sinha, 2017; Hoge et al., 2017). One study reported that both are more effective than antidepressants (Gartlehner et al., 2016).

On the other hand, the results of the current study are inconsistent with previous studies. Pandey and Nayak (2017) found no difference in effectiveness between mindfulness meditation and exercise in the alleviation of depression, whereas Alderman, Olson, Brush, and Shors (2016) reported the benefit of the use of a combination of exercise and meditation in management of depression instead of using only one of them.

LIMITATIONS

This study has some limitations. Although it used a true experimental design, the sample was collected from a single university, which limited the generalizability of the findings. It also measured the level of depression on completion of the program, but not the retention of benefits over time. Future studies are strongly encouraged to compare the effectiveness of meditation and exercise over multiple points in time, and to integrate both physical exercise and mindfulness meditation in one therapeutic regimen to investigate their combined benefit.

The participants were aware of the study purpose, which might have affected their responses in both the pretest and posttest. In addition, the study did not assess the effects of antidepressants or substance abuse among the participants; future studies are recommended to consider these factors before initiation of the therapy. Also, despite including participants with either different levels of depression or none at all, a relatively high attrition rate of 18% still existed between the pretest and posttest, possibly as a result of the social stigma attached to mental health. Future studies are recommended to provide more privacy when conducting the interventions. Finally, the level of exercise and physical activity the students engaged in outside of the study was not assessed. That might have affected the results, as the participants in the physical exercise group might be exhausted and could not perform better. Future studies are recommended to assess the level of physical activity among participants prior to the initiation of the study.

CONCLUSION

The findings revealed that the nursing students in the current study have various degrees of depression, and although mindfulness meditation is recommended over physical exercise in its management, on-campus psychiatric facilities are recom-

mended to ensure privacy and confidentiality in overcoming the social stigma regarding psychiatric illness among students.

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