The Effect of Mindfulness-based Techniques Education on Nursing Students' Anxiety Upon Entering the Clinical Environment during the Covid-19 Outbreak


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Abstract

**Background:** During the Covid-19 outbreak period, psychological disorders, especially anxiety, are highly prevalent among nursing students. Presence in a clinical setting for the first time, despite Covid-19 disease, exacerbates anxiety. The aim of this study was to evaluate the effect of Mindfulness Based Techniques training on anxiety of nursing students in clinical environments arrival.

**Methods:** This is a quasi-experimental that was conducted in 2020-21 on 46 students selected by the census method and randomly assigned to control (n = 22) and intervention groups (n = 22). Two samples were excluded due to exclusion criteria. The data gathering tool was a demographic questionnaire and the Spielberger's Standard Scale. The intervention was carried out by the instructions of Kabat Zinn's mindfulness meetings in 8 sessions for the intervention group. Data were analyzed using SPSS ver.20 software.

**Results:** The results of this study showed that the average anxiety scores of students after the intervention was statistically significant in both groups. The average of students' anxiety scores in the intervention group increased after the intervention.

**Conclusions:** The implementation of an educational program based on mindfulness techniques had a positive effect on nursing students' anxiety disorder during the Covid-19 outbreak period. Therefore, it is recommended to use mindfulness techniques to...
Introduction

Covid-19 disease has been spreading in China since late 2019 and has spread rapidly around the world (Pfefferbaum & North, 2020). The rapid, unknown and dangerous nature of the disease, which causes respiratory tract involvement in the form of ARDS and also causes the death of a large number of patients, among the general public, health care professionals and students, especially Medical science students has caused psychological disorders such as anxiety, stress and depression (Talevi et al., 2020). High mortality rates from this disease as well as the occurrence of different variants of the virus cause anxiety and stress among staff and students of the health care system (Vizheh et al., 2020). Studies have shown that the prevalence of anxiety disorders is higher among nurses and medical students, especially nursing students, compared to normal people. Ansari et al. (2020) in their study reported a 40% rate of anxiety among medical students during the Covid-19 pandemic (Nakhostin-Ansari et al., 2020). Savitsky et al. (2020) reported the prevalence of severe and moderate anxiety among nursing students at 20% and 12%, respectively (Savitsky, Findling, Ereli, & Hendel, 2020). Kochuvilayil et al (2021) report that Australian nursing students are concerned about going to clinical setting and have moderate to severe anxiety (Kochuvilayil et al., 2021). High prevalence of anxiety among nursing students can be Probability of infection in clinical settings, Virtual theoretical courses, Induced stress from the family, exams, the massiveness of curriculums, compressive study periods, and clinical situations that impose mental pressure on students as stress and anxiety (García-González et al., 2021; Labbafinejad & Bossaghzadeh, 2012; Larijani, Neiestanak, Aghajani, & Mehran, 2009).

In this regard, Jalili (2008) points out in his study that students' clinical experiences are the main source of anxiety, and this severe anxiety disrupts their education (Jalili, Mirzazadeh, & Azarpira, 2008). Researchers believe that nursing students' anxiety affects their learning, clinical performance and social relationships, and sometimes leads to mental disorders and even suicide (Sadock, 2012; Shapiro, Schwartz, & Bonner, 1998).

Recently, mindfulness techniques have been suggested as an anxiety treatment (Brown, Creswell, & Ryan, 2015). Mindfulness-based techniques may be a useful way of responding to people with anxiety (Davis & Hayes, 2011). Also, randomized controlled clinical trials have shown a reduced likelihood of recurrence of attacks in people with frequent attacks of depression, following the use of mindfulness techniques (Hofmann, Sawyer, Witt, & Oh, 2010; Öst, 2008; Völlestad, Sivertsen, & Nielsen, 2011). Therefore, the probability that mindfulness cognitive therapy is effective among anxious people exists in reducing anxiety symptoms (Dehghani, Amiri, Molavi, & Neshat-Doost, 2014). Mindfulness requires the creation of three components: avoidance of judgment, intentional awareness, and focusing on the present moment in one's attention (Brown et al., 2015; Rodrigues, Nardi, & Levitan, 2017; Saltzman & Goldin, 2008).

Based on mindfulness-based techniques, the individual becomes aware of the daily activities and automatic functioning of his mind in the past and future and controls them with focus (Davis & Hayes, 2011; Williams et al., 2008). These interventions include concentrated focus exercises, in which the individual concentrates on a particular stimulus such as breathing, physical activity, etc. during a specific period of time, and uses mental and physical relaxation and cognitive techniques for this matter; Mindfulness techniques can be effective in increasing muscle relaxation and reducing anxiety (Azargoon & Kajbaf, 2010; Piet, Würtzen, & Zachariae, 2012; Rodrigues et al., 2017). It seems that the main mechanism of mindfulness is self-control (Brown et al., 2015; Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003). Osman et al. (2021) point to the positive effect of implementing mindfulness-based techniques on the psychological state of health care professionals and trainees (Osman, Hamid, & Singaram, 2021).

Studies in this area are limited and have not been prevalent over the period of Covid-19 disease. (Hofmann et al., 2010; Kaviani, Javaheri, & Hatami, 2011; Krisanaprakornkit, Sriraj, Piyavhatkul, & Laopaiboon, 2006). Therefore, by controlling the anxiety of nursing students, its adverse effects on learning, social relationships and patient safety are certainly controlled and corrected. Due to the importance of the above points, this study was conducted to determine the effect of teaching mindfulness techniques on nursing students' anxiety upon entering the clinical environment during the Covid-19 outbreak.

**Keywords:** Mindfulness based Techniques, Anxiety, Nursing Students, Clinical Setting, Covid-19.
Methods

The current study is a quasi-experimental study with the aim of investigating the effect of teaching mindfulness techniques on nursing students’ anxiety at the time of entering the clinical setting in the Covid-19 pandemic period. All students in the second semester of the school year 2020-21 on our nursing school had been recruited.

The study samples in this study consisted of all second-semester nursing students including 46 students who trained nursing principles. Exclusion criteria from the study included having a history of working in clinical environments, undergoing psychiatric treatments in the past year.

The random allocation process was to determine that the students whose last the number of their student number was odd were included in the intervention group (n = 22) and those whose the last number of their student number was even were included in the control group (n = 22).

The data collection tool was a two-part questionnaire, the first part contained demographic information of students and the second part consisted of Spielberger’s anxiety test, which contains 20 questions. The lowest anxiety score was 20 and the highest score was 80. This questionnaire was measured using a Likert scale in multiple-choice questions including very low, low, high and very high and grades of 1 to 4. The grades of 20 to 31 were considered as mild anxiety, 32 to 42 were lower than medium anxiety, 42 to 53 were higher than medium anxiety, and 54 to 64 were relatively strong anxiety and higher grades than 64 were considered as intense anxiety. The validity and reliability of the tool were investigated by Mahram (2002) (Mahram, 2002). The validity of the tool was determined through the content validity method with a coefficient of 0.96 and its reliability with a coefficient of 0.95.

Two of the samples were excluded from the clinical experience due to having a clinical background and the rest were randomly divided into two groups of control and intervention. Before the implementation of the project, the consent form was completed by the participants. Group meetings in Pandemic Covid-19 are held virtually via Skype and individual meetings are held in person and in accordance with standard health protocols. For intervention group samples, the intervention method which will be described in detail is implemented. The intervention method included 8 sessions of 2 hours (Figure 1).

Teaching reduction of anxiety based on mindfulness: Teaching reduction of anxiety based on Kabat Zinn’s mindfulness was used. This technique is a combination of relaxation and meditation that include training on breathing and attention control, observing feelings and feelings of the body, describing these feelings, accepting them without judgment, and accompanying thoughts and attendance at the present time, especially in routine activities. Teaching sessions of stress reduction based on mindfulness were presented in the current study based on several steps, the steps are as follows:

1. Explanation of the nature of the session formation, the effect of anxiety on the amount of consciousness, self-confidence, and self-expression, and the expression of therapeutic goals.
2. Teaching relaxation through its tension and release in muscles that are associated with emotions.
3. Teaching relaxation by recalling muscle groups that were previously called muscle relaxation via creating tension-release of muscles.
4. Relaxation in various situations and everyday activities.
5. Training the management of respiratory control and meditation (Awareness through observation of physical senses)
6. Generalization of training on breathing control and breathing meditation in everyday activities
7. Complete mindfulness that includes a brief review of the training session before sessions 4, 5 and 6.
8. Summing up the items mentioned in the previous sessions after completing the training and intervention sessions for 1 month, the process of implementing mindfulness-based techniques were followed up by samples.

After the appointed time, Spielberger’s anxiety questionnaire was available to all samples and was completed.

In this research, after intervention in order to observe ethical principles, a course of mindfulness-based techniques was developed for students participating in the control group.

All data were analyzed by SPSS software version 20. All variables measured were continuous data. Chi-square test was used for demographic variables including sex. Independent t-test was used for Age and Students’ GPA1. A paired t-test was used for comparison of the mean of anxiety scores in the control and intervention groups before and after the intervention and an independent t-test was used for comparison of the mean score of anxiety

1 Grade Point Average
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score between two groups of intervention and control before and after the intervention. Independent t-test and paired t-test were analyzed a significant level of P <0.05.

Results

The findings of the study showed that 59.37 % were female and the average age of the samples was 20.66 ± 1.64 years. The mean grade point average of the samples was 16.02. Chi-square and independent t-test did not show a significant difference between sex, age and GPA of samples in the two groups (Table 1). The results of this study showed that the average score of anxiety in the control group before the intervention was 34.78 which decreased to 33.55 after the intervention period. The result of even a t-test showed that there was no significant difference in the control group before and after the intervention (P = 0.095).

Table 1. Demographic profile of students

<table>
<thead>
<tr>
<th>Group Variable</th>
<th>Control</th>
<th>Intervention</th>
<th>Chi-square test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Male</td>
<td>11</td>
<td>13</td>
<td>X² = 0.54</td>
</tr>
<tr>
<td></td>
<td>37.93%</td>
<td>43.33%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>62.07%</td>
<td>56.67%</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>20.16 ± 1.43</td>
<td>20.36 ± 1.85</td>
<td>P = 0.68</td>
</tr>
<tr>
<td>Students’ GPA</td>
<td>16.12 ± 1.92</td>
<td>15.98 ± 2.02</td>
<td>P = 0.78</td>
</tr>
</tbody>
</table>

*SD, Standard Deviation; GPA, Grade Point Average.

The mean of anxiety scores between the control and intervention groups before the intervention was not significant (P = 0.72). After the intervention, there was a significant difference between the mean scores of anxiety in the two groups (P = 0.001). The results of the independent t-test showed a significant difference between the two groups before and after the intervention (P = 0.001) (Table 3).

Table 2. Comparison of the mean of anxiety scores in the control and intervention groups before and after the intervention

<table>
<thead>
<tr>
<th>Time of analysis Group</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>Paired T-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average ± SD</td>
<td>Average ± SD</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>34.78 ± 3.35</td>
<td>33.55 ± 3.69</td>
<td>0.095</td>
</tr>
<tr>
<td>Intervention Group</td>
<td>35.38 ± 4.24</td>
<td>28.87 ± 4.34</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The mean of anxiety scores between the control and intervention groups before the intervention was not significant (P = 0.72). After the intervention, there was a significant difference between the mean scores of anxiety in the two groups (P = 0.001). The results of the independent t-test showed a significant difference between the two groups before and after the intervention (P = 0.001) (Table 3).

Table 3. Comparison of the mean score of anxiety score between two groups of intervention and control before and after the intervention

<table>
<thead>
<tr>
<th>Anxiety Score</th>
<th>Control Group</th>
<th>Intervention Group</th>
<th>Independent T-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average ± SD</td>
<td>34.78 ± 3.35</td>
<td>35.38 ± 4.24</td>
<td>P = 0.72</td>
</tr>
<tr>
<td>After Intervention</td>
<td>33.55 ± 3.69</td>
<td>28.87 ± 4.34</td>
<td>P = 0.001</td>
</tr>
<tr>
<td>Difference between before and after intervention</td>
<td>1.23 ± 0.45</td>
<td>6.51 ± 1.14</td>
<td>P = 0.001</td>
</tr>
</tbody>
</table>

Discussion

Considering that nursing is one of the professions with high stress and anxiety, and this stress and anxiety during educational period is more likely to occur facing the clinical environment for the first time, high levels of anxiety will hurt the learning process in the classrooms and will be more intense in the clinical environment (Jalili et al., 2008; Labbafinejad & Bossaghzade, 2012; Lin, 1991). The results of this study showed that there were no statistically significant differences between the two groups control and intervention in terms of demographic

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variables, therefore it can be concluded that the significant difference in the anxiety scores between the two control and intervention groups was due to the teaching of mindfulness techniques and it is not affected by demographic variables. The results of this study showed that before the intervention, students suffer from moderate to severe anxiety, which is consistent with the results of García-González' study (2021) (García-González et al., 2021). The results of this study showed that teaching mindfulness techniques on students' anxiety has a positive effect on the clinical environment. In confirmation of the results, Shahriari et al. study showed that mindfulness techniques had a positive effect on the level of anxiety and stress among young females (Shahriari & Mehmandoost, 2016). The results of Tanay et al. study have also shown a positive effect on the teaching of mindfulness skills on reducing the symptoms of vulnerable people and anxiety (Tanay, Lotan, & Bernstein, 2012). Vollestad et al. (2011) showed in their study that mindfulness techniques are effective in reducing anxiety (Vollestad et al., 2011). Also, Rodrigues et al. (2017) conducted in their review study that mindfulness techniques could be a good therapeutic strategy for mental disorders and anxiety (Rodrigues et al., 2017). Wong et al. (2016) in their study by comparing two methods of mindfulness-based and teaching psychology in groups showed that there is no difference between the two methods on the number of anxiety disorders (Wong et al., 2016). In their study, Osman et al. (2021) showed that the implementation of online intervention of mindfulness techniques had a positive effect on nurses' stress and burnout in the Covid-19 pandemic, which is in line with the results of the present study (Osman et al., 2021). Since stress and anxiety can cause adverse effects on different aspects of personality and function of students, the probability of affecting individuals, the mental status and daily functioning of students, especially their academic status, both in clinical environments and in theoretical classes and subsequently, the learning of this group is affected (Purfeerst, 2011); However, the lack of communication with patients in the clinical environment and the unprofessional procedures for them also have anxiety-related complications that can lead to distrust from patients by the medical team, especially nurses (Lin, 1991; Purfeerst, 2011). Performing conscious behaviors, conscious monitoring, establishing relationships with thoughts, paying attention to the mind and the body, and practicing and repeating these cases by students in the clinical environment will reduce anxiety and stress, and as a result, their psychological flexibility increases (Purfeerst, 2011; Rosenzweig et al., 2003; Sado et al., 2018). Mindfulness-based cognitive techniques include attention adjustment, excitement, focus on emotions, and admission without judgment, that those aware of these can cope with anxiety and stress (Brown et al., 2015; Sado et al., 2018). By using these techniques, individuals can reject logical thinking patterns such as threatening the environment with rational and positive thoughts and thus reduce anxiety (Wong et al., 2016). Also, the use of mindfulness-based cognitive therapy in anxious students by identifying anxious thoughts, challenging and fighting these thoughts, confronting them and replacing them with non-anxious and non-threatening thoughts reduces the symptoms of anxiety (Rodrigues et al., 2017).

The limitations of this study include a small number of samples and a relatively short follow-up period due to prevalence of Covid-19, and it is recommended that future studies are conducted on more samples and the length of follow-up is to be considered relatively longer in other studies.

**Conclusion**

According to the results of this research, teaching mindfulness techniques is effective in reducing anxiety of students in clinical environments; It seems that the implementation of psychological interventions for students in their educational programs is essential and can be an appropriate method for the counselors and therapists to help students and workers of the clinical sections of hospitals reduce anxiety, in the future.

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**Author's Contributions**

All authors passed the criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

**Funding/Support**

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Ethical Statement

In order to comply with ethical principles, informed consent has been obtained from the samples to participate in the study. This study has been approved by the ethics Ethics Committee of Urmia University of Medical Sciences by the same No. 1394 – 0 – 33 – 1698.

Conflict of Interest

The authors have no conflicts of interest to declare.

Data Availability

The authors guarantee that the data of this research will be provided at the request of other researchers.

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