The effect of online laughter therapy on depression, anxiety, stress, and loneliness among nursing students during the Covid-19 pandemic

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ABSTRACT

Background: Nursing students experienced mental symptoms when they switched to distance education due to the pandemic.

Aims: This study was conducted to evaluate the effects of online laughter therapy sessions on depression, anxiety, stress, and loneliness levels in first-year nursing students.

Methods: In this randomized controlled trial, 61 healthy nursing students were randomly assigned to intervention ($n = 32$) and control groups ($n = 29$). The intervention group received online laughter therapy twice weekly for four weeks. The control group received no intervention. The data were collected using a demographic questionnaire, the Depression Anxiety Stress Scale, and the De Jong Gierveld Loneliness Scale at the study initiation and week four in both groups.

Results: There was no difference between the mean scores of the groups in the pre-test ($p > 0.05$). There was a statistically significant difference between groups in terms of depression after online laughter therapy sessions ($p < 0.05$), but there was no significant difference between anxiety, stress, and loneliness levels ($p > 0.05$).

Conclusions: Online laughter therapy sessions significantly reduced depression but had no effect on anxiety, stress, and loneliness. During the COVID-19 pandemic, online laughter therapy can be organized to reduce depression levels.

Introduction

The frequency of mental health problems in the university population is higher than in the society in the pre-pandemic period, and depression, anxiety, and stress are the most common mental symptoms (Auerbach et al., 2018; Özel et al., 2020; Zeng et al., 2019). The reason for this is that the university-age is a critical and new turning point in terms of both developmental and environmental changes (Fruehwirth et al., 2021). University students experience the transition period from adolescence to adulthood, such as finding their own identity, adapting to the values and rules of society, and reaching physical and social maturity (Taghizadeh Moghaddam et al., 2016). It has been reported that university students have higher depression, anxiety, and stress scores in the first year (Xinqiao et al., 2019). In the first year of university, new experiences such as adapting to the new social environment, living away from family, getting used to a dormitory, getting used to another city, and demanding economic independence can be a factor that creates stress for students.

The World Health Organization predicts that mental illnesses such as depression, anxiety, stress, and loneliness will increase in society due to the impact of the Covid-19 pandemic (WHO, 2021a). It has been reported that nursing students have experienced psychological problems such as depression, anxiety, and stress due to quarantine and social isolation measures during the pandemic process (Akdeniz et al., 2020; Kalkan Uğurlu et al., 2021; Yanik & Yeşilçinar, 2021). Starting to the nursing profession, which carries many health risks, especially the risk of contracting infectious diseases, may have negatively affected the depression, anxiety, and stress levels of students (Arabacı et al., 2015). In addition, it is stated that problems such as lifestyle changes, social isolation, the anxiety of disease transmission, and adaptation to distance education during the pandemic process negatively affect the mental health of students (Akdeniz et al., 2020; Fruehwirth et al., 2021; Wang et al., 2020).2

Loneliness is a negative subjective experience and an important public health problem due to the inadequacy of social relations and interactions (Bu et al., 2020). It is claimed that measures such as the

"Stay at Home" call, curfews, temporary closure of schools, and social distance implemented in the COVID-19 pandemic restrictions adversely affect the mental health of the society and cause a feeling of loneliness (Usher et al., 2020). It is emphasized that with these measures taken to prevent the spread of the contagious disease, the feeling of loneliness intensifies as a result of the inability of people to communicate face to face with their friends, neighbors, and relatives (Rossi et al., 2020).

Laughter therapy is a complementary medicine technique using breathing techniques and laughter (Kataria, 2011). It is stated that laughter therapy reduces levels of stress, depression, anxiety, and loneliness (Alici & Bahceli, 2021; Kataria, 2011; Kaur & Walia, 2008; Kim et al., 2015; Shahidi et al., 2011; Yazdani et al., 2014). In a study of nursing freshmen before the COVID-19 pandemic, it was reported that face-to-face laughter therapy significantly reduced salivary cortisol, a biomarker of stress, as well as depression and anxiety (Ozturk & Tezel, 2021). It is recommended to conduct online activities to improve the mental state of students and provide support during the pandemic process (Wang et al., 2020). Although laughter therapy is usually done face-to-face, it has been observed that it can also be done remotely with online sessions on social media during the pandemic process. This is the first study to use online laughter therapy to reduce students' mental problems. This study was conducted to evaluate the effects of online laughter therapy sessions on depression, anxiety, stress, and loneliness levels in first-year nursing students.

The hypotheses are as follows:

H.1. Online laughter therapy has an effect on reducing the level of depression.

H.2. Online laughter therapy has an effect on reducing the level of anxiety.

H.3. Online laughter therapy has an effect on reducing the level of stress.

H.4. Online laughter therapy has an effect on reducing loneliness.

Materials and methods

Design

The present study was designed as a parallel, two-armed, randomized controlled trial. This study was conducted on first-year nursing students at a state university nursing faculty in Ankara, Turkey between May 01 and 31, 2021. Participants were randomized to intervention (online laughter therapy) and control group.

Participants

Participants eligible for inclusion criteria in this study were: (a) being a first-year nursing student, (b) being aged above 18 years old, (c) feeling in good health to go about their daily lives, performing normal school lives.

Exclusion criteria in this study included having any condition where laughter therapy should be avoided (having had abdominal surgery in the last three months, taking regular medications, epilepsy, uncontrollable hypertension, glaucoma, hernia) (Kataria, 2011).

The reason of choosing those exclusion criteria was to avoid unintended side effects of laughing. People might over-strain themselves while laughing and that can cause a rise in intra-abdominal pressure (Kataria, 2011).

Sample size and sampling

The study population comprised 213 first-year nursing students at the Ankara University Nursing Faculty. The sample size was calculated with the use of software (G-Power) considering the study design, and the main statistical test of the study. In the power analysis, the required sample size was calculated as 26, with an effect size of 0.80, a power of 0.80, and a margin of error of 0.05. Thus, the sample of the research was composed of 70 students, considering the dropout rate (Fig. 1).

For sampling, a screening tool was applied online to 213 first-year students for the inclusion criteria, and 194 students who met the inclusion criteria were included in the study. To form the intervention group and control group, a random selection was made from a real random number selector website, www.random.org, among 194 students who met the inclusion criteria. There were 35 students in the intervention group and 35 students in the control group. However, three students from the intervention group did not attend the sessions and six students from the control group did not complete the post-test. As a result, this study was completed with a total of 61 students, 32 from the intervention group and 29 from the control group (Fig. 1). In this study, only the second author was blinded to the group allocation.

Procedure

The e-mail addresses and phone numbers of the students were obtained from the student affairs unit of the University, and the intervention and control groups were reached. An online information meeting was held with the intervention and control group students one week before the start of the laughter therapy sessions.

Pre-test: Before the online laughter therapy sessions started, the link to the online questionnaire was shared with the intervention and control group students. Students were asked to fill out the questionnaire.

Intervention (online laughter therapy sessions): A person who has been trained in laughter therapy and applies this intervention to a group is called a laughter therapy leader. The corresponding author is the leader of laughter therapy, and she had students do the online laughter therapy sessions herself. The intervention group took eight online sessions of laughter therapy, that is two sessions per week for four weeks. The number of laughter therapy sessions in this study was determined in line with the studies in the literature (Ozturk & Tezel, 2021; Yazdani et al., 2014). Each laughter therapy session lasted about 40–45 min. A laughter therapy session consists of clapping and warming-up exercises, deep breathing exercises, childlike playfulness, and laughter exercises (Fig. 2).

Post-test: After all the online laughter therapy sessions were completed, the online questionnaire link was shared with the students in the intervention and control groups and the students were asked to fill in the questionnaire.

Instruments

An online questionnaire was prepared via Google Forms, using the questionnaire, DASS-42, and De Jong Gierveld Loneliness Scale to collect data.

The questionnaire included closed-ended questions related to demographic features (age, gender, residence, marital status, whether there are any health problems, taking regular medications, surgery in the last three months).

The Depression, Anxiety, and Stress Scale (DASS-42) was developed by Lovibond and Lovibond (1995) and adapted into Turkish by Bilgel and Bayram (2010). The scale consists of 42 items, 14 of which are depression, 14 are anxiety and 14 are stress. Depression items measure dissatisfaction, helplessness, worthlessness, loss of interest, and low energy level. Anxiety items assess the individual's level of autonomic arousal, situational anxiety, subjective anxiety, and muscle response. Stress items measure persistent tension, irritability, and a tendency to overreact to stressful events. The scale is a four-point Likert-type scale, and the items are evaluated between 0 and 3 (0 = not at all suitable for me, 1 = somewhat appropriate for me, 2 = usually suitable for me, 3 = completely suitable for me). The total scores of the scale range from 0 to
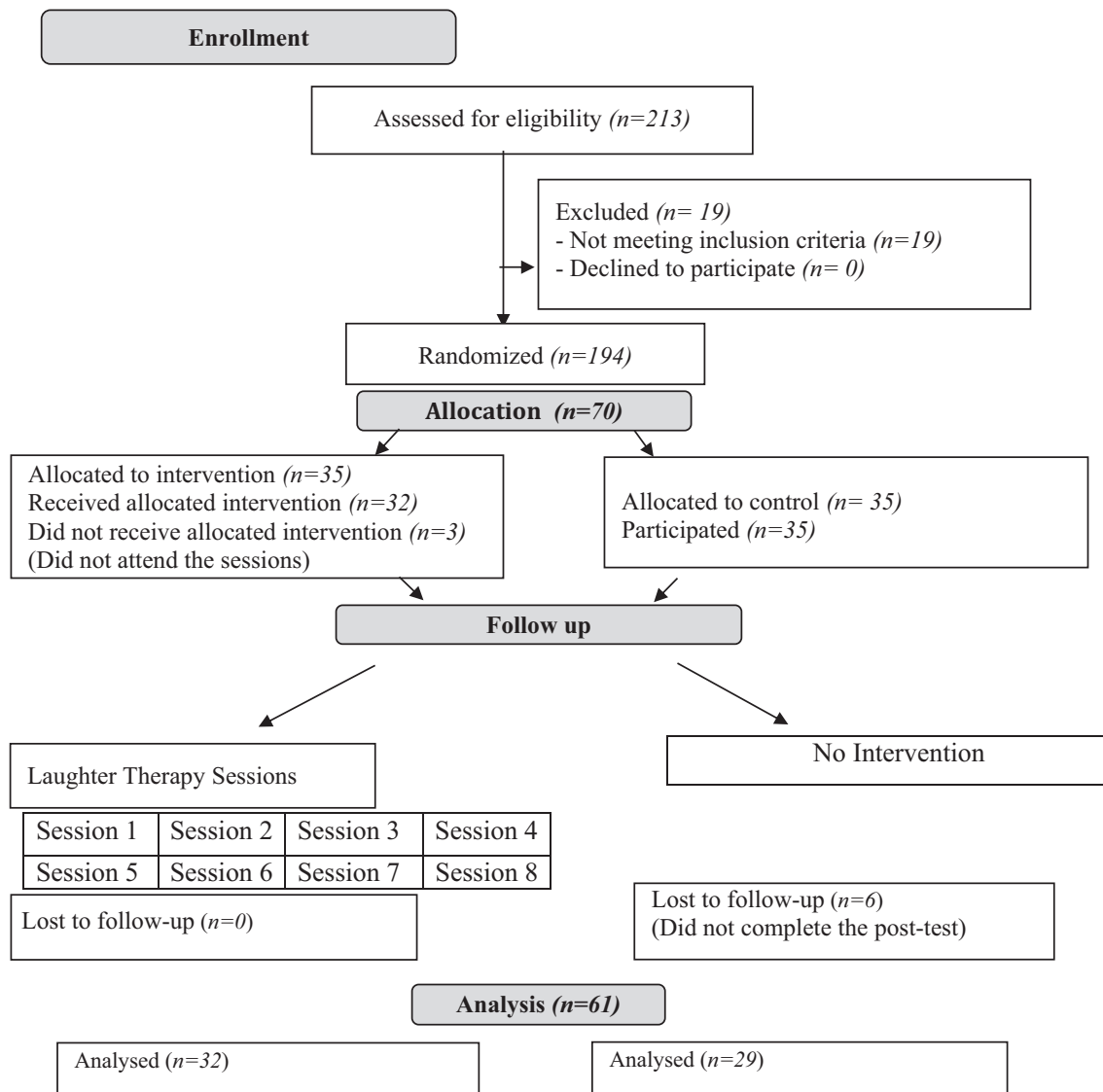
Fig. 1. Consort diagram.

42 for each sub-dimension. Scores considered in the normal range are 0–9 for depression, 0–7 for anxiety, and 0–14 for stress. Scores above these ranges indicate the degree of the problem from mild to extreme (Bilgel & Bayram, 2010). The Cronbach's alpha reliability coefficients for the depression, anxiety, and stress sub-dimensions of the scale are 0.92, 0.86, and 0.88, respectively. In this study, the Cronbach's alpha reliability coefficient for the depression, anxiety, and stress sub-dimensions of the scale were 0.95, 0.88, and 0.92, respectively.

The De Jong Gierveld Loneliness Scale (DJGLS) was originally developed by De Jong-Gierveld and Kamphuis (1985) and adapted into Turkish by Çavdar et al. (2015). De Jong Gierveld Loneliness Scale consists of 11 items and two subscales. On the scale, six negatively worded items measure emotional loneliness and five positively phrased items measure social loneliness. The sum of these two subscales constitutes the overall loneliness score. Since the items in the social loneliness dimension contain positive statements, the items are reverse coded. After reverse coding, "not applicable = 0" and "not applicable = 0"; A total of 11 points can be obtained by recoding as "appropriate = 1" and "very suitable = 1". According to these scores, people can be divided into four groups: not alone (0, 1, 2 points), moderately lonely (range 3 to 8), severely lonely (9, 10 points), and very severely lonely (11 points). In the study of Çavdar et al. (2015), the Cronbach Alpha reliability

coefficient of the scale was found to be 0.87. In this study, Cronbach's alpha reliability coefficient for the DJGLS was 0.80.

Statistical analysis

The data were analyzed via the Statistical Package for the Social Sciences (SPSS) version 26.0. Demographic characteristics such as gender, marital status, and residence were determined by percentage and frequency. The age of the participants was calculated by analyzing the mean, minimum, and maximum values. The values of skewness and kurtosis were all within the recommended limit of ± 2, which indicates the normal distribution of all the constructs of the study (George & Mallery, 2010). Independent sample *t*-test was used to compare the pretest and posttest scores between the intervention and control groups. Statistical significance level was accepted as $p < 0.05$.

Ethical principles

Permission was obtained from the Koc University nursing school and ethics committee (Date: 25/02/2021, No:2021.072.IRB3.033) for this research. Participants who are willing to participate in the study signed an online consent form to enter the online questionnaire.

Parts	Online Laughter Therapy Session	Duration (Minutes)
1	*Clapping and Warming-up Exercises* Hands are kept parallel to each other, followed by clapping the hands with the fingertips and palms facing each other. Thus, the acupuncture points on both hands are stimulated, causing the individual's energy level to increase. Clapping is done with a rhythmic pattern to increase the energy level and create synchronization in the group (Rhythm: 1-2, 1-2-3). The rhythmic patterns are accompanied by the mantra "ho-ho, ha-ha-ha" chanted aloud.	10
2	*Deep Breathing Exercises* By lifting the arms up, a breath is taken as deeply as possible. After deep inhalation, breath is held for 4-5 seconds and then exhaled slowly and rhythmically after arms are brought to normal position. In any deep breath exercise technique, exhalation time should be longer than inhalation time. Breathing exercises is gamified with activities such as blowing balloons or smelling flowers.	5-10
3	*Childlike playfulness* Childlike playfulness is used to help laugh for no reason just like a child. "Very good" is said and at the same time the hands are clapped, the same word and clapping are repeated. Then the arms are raised to the sky and simultaneously shout "yeah".	10
4	*Laughter Exercises* In this part, the group is encouraged to laugh with various laughter exercises. Some laughter exercises: Popcorn, elevator, mask, quarantine, cream cake, bubble, hot soup, barbell, national lottery, strawberry milk, greeting, lion, laughter lotion, orchestra, aloha (Hawaiian greeting), and motorcycle laughter. For example, in the popcorn laughter exercise, the leader of the laughter therapy commands the group, "Let's take a deep breath, imagine we are a corn kernel in a hot frying pan, and laugh while it explodes" and the group laughs together.	15

Fig. 2. Parts of an online laughter therapy session (Kataria, 2011).

In order to carry out the research, students were asked for their e-mail addresses and mobile phone number. This information was collected only for the purpose of sending information about the online survey and online laughter therapy sessions. Contact information of students was not shared with third parties.

Results

The demographic characteristics of the students in the intervention and control groups were similar. The students were all girls, all single, and all stayed in their own homes. The mean age of the students was 19.59 ± 2.31 (min = 18, max = 36).

The outcome variables of depression, anxiety, and stress were measured using data from the DASS-42, with means for each of the measures at pre-test and post-test by group shown in Table 1. At baseline (i.e., before the intervention group had undergone the online laughter therapy intervention), no significant difference was found between the intervention and control groups in terms of mean DASS-42 total score ($t = 0.875$, $p = 0.385$). After online laughter therapy intervention, there was a statistically significant difference between mean DASS-42 total scores of the intervention and control groups ($t = -2.268$, $p = 0.027$). While there were no statistical difference between the groups in terms of depression ($t = 0.854$, $p = 0.960$), anxiety ($t = 1.563$, $p = 0.123$), and stress ($t = 1.128$, $p = 0.264$) subscale scores before laughter therapy, it was found that the mean scores of depression subscale in the intervention group after online laughter therapy were lower than those before the intervention and also the results of the independent t-test showed a significantly difference between intervention and control groups ($t = -2.997$, $p = 0.003$). However, there was no significant difference in

Table 1
Comparison of Depression Anxiety Stress Scale mean scores before and after the intervention according to groups.

DASS-42		Intervention (n = 32)	Control (n = 29)	t	p
		Mean (SD)	Mean (SD)		
DASS-42 (pre-test)		44.65 (22.70)	39.44 (23.78)	0.875	0.385
DASS-42 (post-test)		27.78 (17.95)	39.65 (22.84)	−2.268	**0.027**
Subscales	Depression subscale (pre-test)	13.93 (9.67)	14.06 (10.74)	0.854	0.960
	Depression subscale (post-test)	7.03 (6.11)	13.44 (9.94)	−2.997	**0.003**
	Anxiety subscale (pre-test)	11.90 (7.31)	9.13 (6.42)	1.563	0.123
	Anxiety subscale (post-test)	7.90 (6.70)	9.51 (6.58)	−0.945	0.348
	Stress subscale (pre-test)	18.81 (8.63)	16.24 (9.16)	1.128	0.264
	Stress subscale (post-test)	12.84 (7.31)	16.68 (9.13)	−1.824	0.073

Independent samples t-test. Bold values indicate a statistically significant difference.

anxiety and stress subscale scores between intervention and control groups ($p > 0.05$) (Table 1).

The outcome variable of loneliness was measured using data from The De Jong Gierveld Loneliness Scale, with means for each of the measures at pre-test and post-test by group shown in Table 2. The results show that there was no statistical difference between the groups in terms of loneliness before and after online laughter therapy sessions ($p > 0.05$) (Table 2).

Discussion

This study was conducted to examine the effects of online laughter therapy sessions on depression, anxiety, stress, and loneliness levels in first-year nursing students. This study is the first in the literature to show that laughter therapy can be done online during the COVID-19 pandemic and is effective in reducing depression. In addition, this study was carried out in May, when full closure measures were taken, and the curfew and distance education continued in Turkey. It is thought that this study will be an important basis for future online laughter therapy studies. The findings of the study were discussed with previous studies since there was no study examining the effects of laughter therapy on students' depression, anxiety, stress, and loneliness levels during the pandemic process.

Depression affects >264 million people worldwide, and it is predicted that its prevalence and degree may increase with the effect of the pandemic. It is estimated that 76–85 % of people in low- and middle-income countries do not have access to treatment for depression (WHO, 2021a; WHO, 2021b). In the studies, it is stated that nursing students experience depression at various frequencies and degrees during the pandemic (Kalkan Uğurlu et al., 2021; Wang et al., 2020; Islam et al., 2020). Laughter therapy is an effective complementary medicine technique for reducing depression (Kataria, 2011; Shahidi et al., 2011). In this study, it was found that online laughter therapy sessions significantly reduced students' depression. According to this result, H.1 hypothesis was accepted. The findings of our study are similar to the studies in which face-to-face laughter therapy was performed on nursing students before the pandemic (Ozturk & Tezel, 2021; Yazdani et al., 2014). In a study of elderly women with depression in Iran, laughter therapy was found to be effective in the improvement of depression (Shahidi et al., 2011). In this study, the significant decrease in the level of depression may be related to the introduction of more oxygen into the body with deep breathing exercises, increased energy level with warm-up exercises, various physiological changes (increase in beta-endorphin

level and decrease in cortisol) in the body with childlike playfulness and laughter exercises. More, it is thought that during the COVID-19 pandemic restrictions, by participating in an online activity that provides group interaction such as laughter therapy in a socially isolated environment at home, they interact with their friends so that there could be an improvement in depression.

It is stated that anxiety and stress are commonly seen in nursing students during the COVID-19 pandemic (Islam et al., 2020; Kalkan Uğurlu et al., 2021; Naser et al., 2020). Laughter therapy is an intervention that has positive effects on anxiety and stress levels. In this study, although there was a significant decrease in the anxiety and stress levels of the students in the intervention group with the online laughter therapy, this decrease did not reach the level of significance in the intergroup analysis. According to this result, hypotheses H.2 and H.3 were rejected. The lack of a significant decrease in anxiety and stress levels might be associated with the students having a concern about disease transmission due to the ongoing pandemic process for more than a year, the distance education process, and the inability to practice face-to-face even though they are receiving training in a profession that requires practice/skill. All these concerns might be settled and chronic (Yanik & Yeşilçinar, 2021). In addition, students might still feel intense and constant sources of anxiety and stress such as the ongoing pandemic process, the change in daily lifestyle with the restrictions made during the pandemic process, the desire to return to the normal lifestyle before the pandemic, economic difficulties, false information circulating about the disease, and lack of social activity.

In studies conducted with nursing students during the pandemic, it has been reported that most of the students socially isolate themselves to protect themselves from infectious disease and experience a severe sense of loneliness (Akdeniz et al., 2020; Yanik & Yeşilçinar, 2021). Laughter therapy is reported to reduce loneliness (Alici & Bahceli, 2021; Sabori et al., 2019). In this study, a decrease was observed in the loneliness level of the intervention and control groups, but this decrease did not reach the level of significance between the groups. Thus, H.4 hypothesis was rejected. The decrease in the level of loneliness in both groups may be related to the gradual reduction of restrictions and the gradual transition to normalization in Turkey after May 17th, 2021. It is thought that with the reduction of restrictions, the students may have met their friends and relatives and reduced their loneliness levels.

Strengths and limitations

In this study, delivering an online intervention can be considered both a strength and a limitation. This study shows that online intervention attempts can be made to improve mental health even in an environment where face-to-face interventions are not possible, curfews are applied, measures to combat pandemics are taken, which can be considered the strength of this study. On the contrary, implementing laughter therapy online is also a limitation, because there is more face-to-face interaction in nature of laughter therapy, so laughter therapy sessions are held more enthusiastically. Also, a small number of attendees rarely experienced technical connectivity issues and joined a few sessions late, so technical issues may be a limitation. The results of this study can only be generalized to the study sample.

Conclusions

Online laughter therapy was found to be effective in reducing depression among first-year nursing students but was not found to be effective for anxiety, stress, and loneliness. It is recommended to apply for a laughter therapy program online and integrate it into the nursing education process to reduce the depression level of university students during the quarantine process in the restrictions during the COVID-19 pandemic process and potential pandemic restrictions that may occur in the following years.

Table 2
Comparison of De Jong Gierveld Loneliness Scale mean scores before and after the intervention according to groups.

DJGLS		Intervention (n = 32)	Control (n = 29)	t^a	p
		Mean (SD)	Mean (SD)		
DJGLS (pre-test)		3.75 (3.25)	3.93 (2.71)	0.177	0.815
DJGLS (post-test)		2.84 (2.42)	3.72 (3.08)	−1.246	0.218
Subscales	Social Loneliness (pre-test)	6.65 (2.90)	5.31 (3.32)	1.687	0.097
	Social Loneliness (post-test)	1.15 (1.34)	1.58 (1.65)	−1.116	0.269
	Emotional Loneliness (pre-test)	2.37 (1.77)	2.34 (1.71)	0.067	0.947
	Emotional Loneliness (post-test)	1.68 (1.49)	2.13 (1.82)	−1.059	0.294

[a] Independent samples *t*-test.

Declaration of competing interest

The authors state that there is no conflict of interest.

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