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Effects of Music Therapy on Depression among College Students during the COVID-19 Pandemic

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Abstract: - Anxiety and depression are prevalent mental health problems. Along with stress, they are considered effective outcomes of mental health. This paper intended to examine whether music listening for ballet and watching ballet could help lower depression levels in college students. Eighty-four participants who were selected from different universities in Guangzhou completed a 13-week randomized controlled trial. They were segregated into the music group (n = 28), the music and watch group (n = 28), and the non-participant or control group (n = 28). The first group was administered with 30 minutes of weekly music listening suggestions, and the music and watch group watched dance performance videos for 30 minutes a week. The score of depression in the subjects were estimated with the help of the Depression, Anxiety and Stress Scale-21. They had to a given a rating to every aspect on a Likert scale of four points ranging from zero: "not true" to three: "always true." The subjects in the music and watch groups showed substantially lower depression levels in comparison to subjects from the non-participating group. Therefore, music listening may be a beneficial strategy in reducing patients' levels of depression. To promote college students' physical and mental health, colleges and universities should incorporate music therapy into their mental health education curriculum.

Keywords: ballet music; college students; COVID-19; depression; mental health

Introduction

Covid-19 or the he Coronavirus disease in 2019 (COVID-19) initially originated in the Wubei province of Wuhan, during December 2019 and rapidly transmitted to 24 countries worldwide (Hui & Madani, 2020). As the outbreak globally evolved, the mental health problems that accompanied the pandemic were promptly aggravating the public health burden (Torales, 2020). These outbreaks of infectious diseases cause people to be diagnosed with mental health concerns, like emotional distress, and also other mental illnesses like anxiety, phobias and depression (Shultz et al., 2015). The WHO (2013) or the World Health Organization suggests that the concept of health can be understood, as a condition where people experience complete social, mental and physical wellbeing and not just be free of a disorder. With the increasing demands of present-day society, different groups of people are experiencing increasing pressure, and a significant component are students. The seriousness of college students' mental health problems is gradually being recognized. Multiple reports indicate excessive stress, anxiety and depression, and also increases in debilitating mental health outcomes among them (Benton et al., 2003). The mental wellbeing of students from college in during COVID-19 were investigated and it was found that older college students were more anxious and hostile. Students experiencing major life events were susceptible to showing symptoms of somatization. Students not having less social support were also susceptible to experience depression and panic than those with close friends. A survey was conducted on the levels of anxiety status in returning students from college during the pandemic. It was found that 20.0% of them had mild levels of anxiety, and 6.5% had severe or moderate levels of anxiety (Chen, et al., 2020). These conditions may adversely affect basic activities and can cause sleep deprivation, eating irregularities, and substance abuse (Saharaian & Javadpour, 2010). College students experience a greater psychological impact, as excessive stress exposure may lead to poor mental, emotional and physical health outcomes (Päivi & Vainiomäki, 1999). Classes, traumatic events, and moral

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dilemmas may be aggravating factors for vulnerability to psychological conditions like depression (Dyrbye et al., 2006). College students' mental health has become one of the main obstacles to their healthy development and should be a highly prioritized mental health and wellbeing challenge for intervention.

The Music, Mood, and Movement theory, that describes the impacts of music on human psychological responses states that Music can produce mood-altering psychological responses that improve health. (Murrock & Higgins, 2009). Music listening is a non-pharmaceutical and non-surgical way to affect mood may control depression. This is seen when the emotional and psychological responses produced by music are considered. (Chan et al., 2012). Music surpasses the auditory brain cortex, where the limbic system evaluates it leading to emotional responses (Tramo, 2001). Listening to suitable music can regulate the emotions of the subject, that can result in useful effects, like reducing depressive effects (Guzzetta, 1988).

Common types of therapeutic music include eastern and western classical music, folk music, new century music, and so on. Most types of therapy will not choose a single type of music (Chan, 2011; Maratos, 2008). Some researchers speculate that music therapy is always beneficial, regardless of the type of music used (Hsu, 2004). Recent studies have shown that allowing subjects to select the type of music can result in beneficial treatment by promoting relaxation and by decreasing anxiety (Lee et al., 2005; Chang et al., 2008; Chan et al., 2009; Hsu & Lai, 2004). Music between 60 and 80 beats every minute, which is closest to the human heart beat, can relieve peoples' negative emotions and enable them to physically and mentally relax (Chan, 2011). However, limited papers have investigated where listening to music-controlled depression during COVID-19, especially among college students. The following study intends to study the impact of music listening on the depressive outcomes of students studying in college in the context of COVID-19.

Literature Review

Materials and Methods

Experimental Design

For investigating the role of music on depression, this study implemented a 13-week randomized controlled trial (RCT) via the internet between October and December 2021. It evaluated the hypotheses that periodic music listening can decrease symptoms of symptoms.

Around 1,890 college students were selected, of whom 84 could finish the complete study. These 84 subjects were segregated to three groups in a randomized manner. One of the groups (the non-participating group, n = 28) were not required to engage in music listening and the remaining two groups (music group, n = 28; music and watch group, n=28) had to listen to dance and drama music for 30 minutes weekly for 13 weeks.

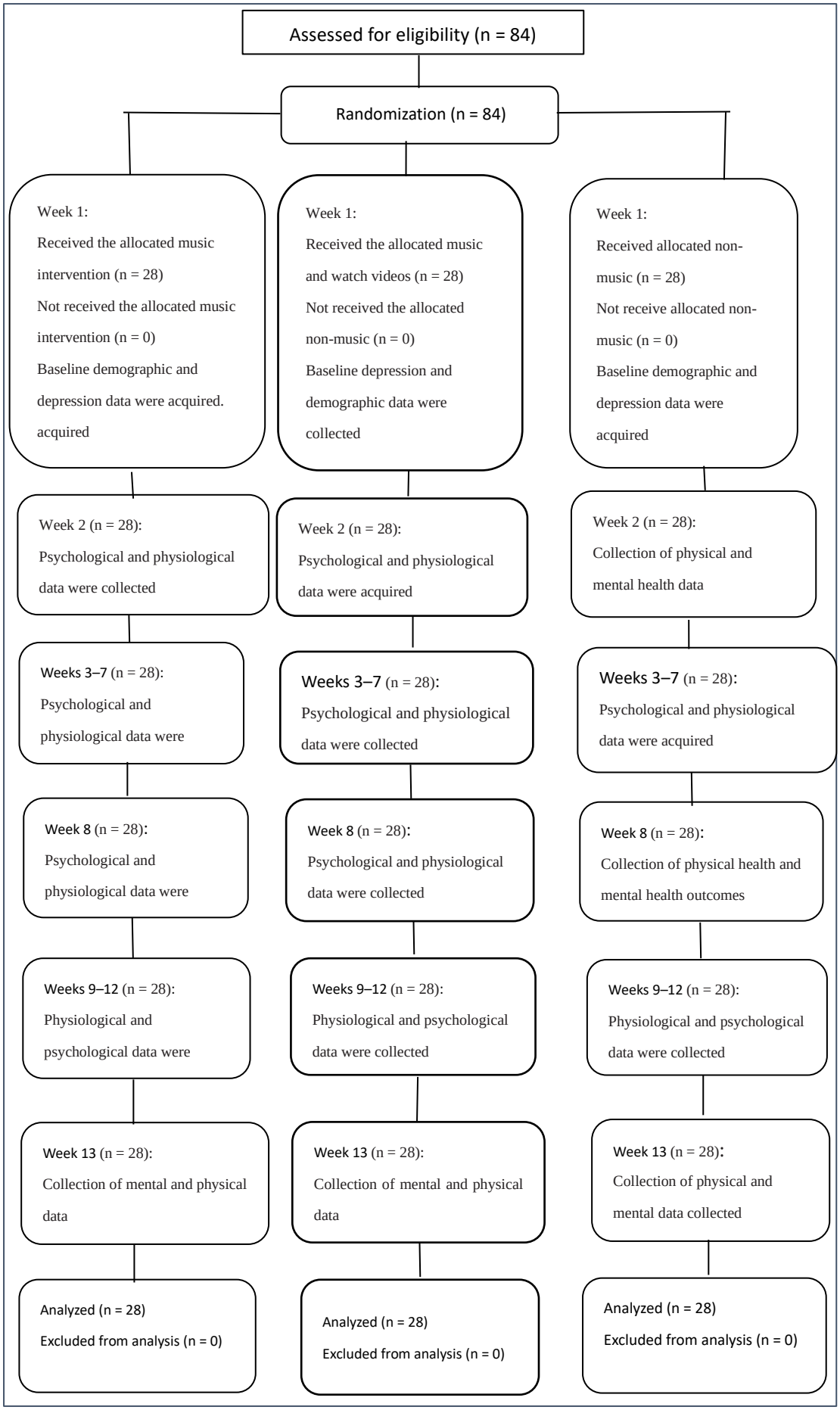
Measures

Firstly, the health and demographic data of the subjects, like sex, age, marital status, religion, musical experience, level of education and health history were collected. Such factors have prevalently been used in other papers that evaluated the role of music intervention (Moradipanah et al., 2009; Chan et al., 2009;). During the pandemic, anxiety and depression were the main negative emotions (Tian et al., 2020). The Depression, Anxiety and Stress Scale-21 (DASS-21), which measures anxiety, stress and depression, was employed for checking the depression scores of participants.

Methods

The researchers implemented a randomized controlled study. The design was also based on repeated measurements with music interventions for every week throughout 13 weeks. The levels of depression in the participants were also scored every week. Each of these stages have been represented in the figure below.

Figure 1. Experimental Flowchart


Assessed for eligibility (n = 84)
Randomization (n = 84)
Week 1:
Received the allocated music intervention (n = 28)
Not received the allocated music intervention (n = 0)
Baseline demographic and depression data were acquired. acquired
Week 1:
Received the allocated music and watch videos (n = 28)
Not received the allocated non-music (n = 0)
Baseline depression and demographic data were collected
Week 1:
Received allocated non-music (n = 28)
Not receive allocated non-music (n = 0)
Baseline demographic and depression data were acquired
Week 2 (n = 28):
Psychological and physiological data were collected
Week 2 (n = 28):
Psychological and physiological data were acquired
Week 2 (n = 28):
Collection of physical and mental health data
Weeks 3–7 (n = 28):
Psychological and physiological data were
Weeks 3–7 (n = 28):
Psychological and physiological data were collected
Weeks 3–7 (n = 28):
Psychological and physiological data were acquired
Week 8 (n = 28):
Psychological and physiological data were
Week 8 (n = 28):
Psychological and physiological data were collected
Week 8 (n = 28):
Collection of physical health and mental health outcomes
Weeks 9–12 (n = 28):
Physiological and psychological data were
Weeks 9–12 (n = 28):
Physiological and psychological data were collected
Weeks 9–12 (n = 28):
Physiological and psychological data were collected
Week 13 (n = 28):
Collection of mental and physical data
Week 13 (n = 28):
Collection of mental and physical data
Week 13 (n = 28):
Collection of physical and mental data collected
Analyzed (n = 28)
Excluded from analysis (n = 0)
Analyzed (n = 28)
Excluded from analysis (n = 0)
Analyzed (n = 28)
Excluded from analysis (n = 0)

Instruments

The participants' depression scores were assessed using DASS-21, which is a summarized version of the self-reported Depression, Anxiety, and Stress Scale by Lovibond and Lovibond (1995), which also had 42 items. The DASS-21 scale includes three subscales on anxiety, stress and depression. The internal consistency coefficient of the questionnaire (Cronbach's α) was 0.956. The Cronbach's α for each subscale was > 0.8. The retest reliability was 0.884. The correlation coefficients of the total score of the scale and each subscale were 0.922 (depression) and 0.927 (anxiety). Three common factors (stress, anxiety and depression) were extracted from the scale and explained 58.45% of the total variables. The convergence validity and convergence validity of the scale are reasonable and suitable for college students (Xu et al., 2010). DASS-21 is known as a questionnaire, containing 21 items that measures the seriousness of symptoms of stress, anxiety and depression by using a self-reported format and by summing the scores of seven items in each area. The scores are classified as "normal," "mild," "moderate," "severe," or "extremely severe." This tool was selected since it shows reliability and convenience during administering. It was therefore suitable for research and clinical purposes. These items were related to subjects' "recent (past week)" experiences of adverse emotions or related physical outcomes. Items included statements, such as, "I'm depressed" and "I'm starting to feel thirsty." The subjects had to rate each of the items on a 4-point Likert-scale. This was from zero: "not true" to three: "always true." After testing, the questionnaire had a good validity and reliability, simplicity in its language, and short time of usage (Psychology Foundation of Australia, 2018).

Participants

Around 84 participants (76 females) participated in the trial (Age: 18-25 years). Every subject was numbered ranging from one to 84 and assigned randomly to either listen to music, watch videos, or not listen to music. There were 28 participants in each of the three groups. They were contacted through social media, and the music intervention was conducted online, by using convenient sampling methods and questionnaires. Of the 84 participants, none dropped out of the study.

The music used in the study was from the musical ballet "Flag." It has songs that have fast melodies and also are lyrical. The listener was free to select any track they preferred from the list.

Demographics

Most of the subjects were not affiliated to any religion (98.8%), did not regularly engage in music listening (81%), and did not have any serious health conditions (98.8%). No significant differences were seen in the medical history and demographics of these groups (Table 1).

Table 1. A comparison of the groups' demographic characteristics

Demographic	Total (n = 84) n (%)	Non-music (n=28) n (%)	Music (n = 28) n (%)	Music & watch (n=28) n (%)
Age				
18-25 years	84 (100)	28 (100)	28 (100)	28 (100)
Sex				
Male	8 (9.5)	3 (10.7)	3 (10.7)	2 (7.1)
Female	76(90.5)	25(89.3)	25 (89.3)	26(92.9)
Marital status				
Married	0 (0)	0 (0)	0 (0)	0 (0)
Single	84(100)	28(100)	28 (100)	28 (100)
Educational level				
Graduate	84 (100)	28 (100)	28 (100)	28 (100)

Religious belief				
No	83 (98.8)	27 (96.4)	28 (100)	28(100)
Yes	1 (1.2)	1 (3.6)	0 (0)	0 (0)
Perception of sleep quality				
Good; very good	30 (35.7)	9 (32.1)	8 (28.6)	13 (46.4)
Fair	22 (26.2)	8 (28.6)	8 (28.6)	6 (21.4)
Bad; very bad	32 (38.1)	11(39.3)	12(42.8)	9 (32.1)
Habit of listening to music				
No	68 (81.0)	25 (89.3)	20 (71.4)	23 (82.1)
Yes	16(19.0)	3 (10.7)	8 (28.6)	5 (17.9)
Chronic illnesses				
No	83 (98.8))	28 (100)	27 (96.4))	28 (100)
Yes	1 (1.2)	0 (0)	1 (3.6)	0 (0)

Ethical Considerations

Prior to commencing with the music intervention, the study's methods and purpose were explained to each participant in writing and informed consent was collected. The subjects' identities were removed to maintain confidentiality. They were also told that while attending the study, if they felt uncomfortable or distressed in any way, they could immediately stop the intervention.

Data Collection

The subjects in the music group (n = 28) had an audio intervention over the internet once every week and were could freely listen to their favorite music for 30 minutes. The 28 participants in the music and viewing group organized an online intervention once every week and could select freely their favorite video clips to watch for 30 minutes. After 30 minutes, their outcomes of depression were acquired with the help of DASS-21. Outcomes of depression were collected from the second week and until week 13. The experiments for both groups were implemented in settings that were comfortable and quiet. The subjects were required to relax themselves prior to the experiment. Prior to data collection, the control group subjects were also required to relax themselves for some time prior to collecting their depression scores.

Results

Data analysis

The Statistical Package for the Social Sciences (SPSS) version 12.0 (IBM, Chicago, IL, USA) was used to check the results. Table 2 presents the findings of the DASS-21's results by groups over the first week to week 13.

Table 2. The comparison of the DASS-21's results by groups over weeks one–13

Depression	Music (n = 28)			Non-music (n = 28)			Music and watch (n = 28)			Intergroup significance		
	MEAN (SD)	Median (Range)	Intra-group significance	MEAN (SD)	Median (Range)	Intra-group significance	MEAN (SD)	Median (Range)	Intra-group significance	Music VS Non-music	Non-music VS watch	Music VS watch
Week 1	44.0(4.7)	43(39.0-56.0)	0.88	43.6(3.9)	42(40.0-58.0)	0.73	43.5(4.6)	42(39.0-56.0)	0.86	0.73	0.92	0.6855
Week 2	42.3(4.5)	41.5(37.0-54.0)	0.84	43.6(3.9)	42(40.0-58.0)	0.73	42.1(4.5)	40(37.0-54.0)	0.85	0.25	0.19	0.8584

Week 3	41.7(4.1)	40.5(37.0-53.0)	0.78	43.5(3.8)	42.5(40.0-57.0)	0.72	41.4(3.0)	39.5(37.0-52.0)	0.76	0.10	0.04	0.6956
Week 4	41.4(4.2)	40(37.0-53.0)	0.80	43.4(3.7)	43(40.0-57.0)	0.71	40.8(4.1)	39(37.0-51.0)	0.78	0.07	0.02	0.5871
Week 5	39.9(4.1)	39(35.0-51.0)	0.78	43.4(3.7)	43(39.0-57.0)	0.69	39.8(3.8)	38(35.0-49.0)	0.71	0.0018	0.0001	0.5237
Week 6	39.1(4.1)	37.5(33.0-48.0)	0.75	43.3(3.5)	43(39.0-55.0)	0.66	39.4(3.5)	37(35.0-47.0)	0.66	0.0001	<0.0001	0.4757
Week 7	38.4(3.4)	37.5(34.0-47.0)	0.64	43.1(3.4)	43(39.0-55.0)	0.64	37.6(3.1)	37(34.0-45.0)	0.59	<0.0001	<0.0001	0.3701
Week 8	37.5(3.5)	36.5(33.0-47.0)	0.67	43.1(3.4)	43(39.0-55.0)	0.65	36.9(4.0)	36(33.0-45.0)	0.56	<0.0001	<0.0001	0.4905
Week 9	36.3(3.4)	35(32.0-46.0)	0.64	43.0(3.6)	42.5(39.0-55.0)	0.68	35.6(2.5)	35(33.0-43.0)	0.48	<0.0001	<0.0001	0.3522
Week 10	35.3(3.5)	34(31.0-45.0)	0.66	43.1(3.8)	42.1(39.0-56.0)	0.72	34.6(2.4)	34(31.0-42.0)	0.46	<0.0001	<0.0001	0.3552
Week 11	34.3(3.3)	33.5(30.0-43.0)	0.62	43.1(3.7)	42.0(39.0-56.0)	0.69	33.2(2.3)	33(30.0-40.0)	0.43	<0.0001	<0.0001	0.1599
Week 12	33.7(3.0)	33.0(29.0-41.0)	0.56	42.9(3.5)	42(39.0-55.0)	0.67	32.6(2.1)	32(29.0-39.0)	0.39	<0.0001	<0.0001	0.112
Week 13	33.2(2.7)	32(29.0-40.0)	0.51	42.9(3.5)	42(39.0-55.0)	0.66	32.0(2.2)	32(29.0-39.0)	0.41	<0.0001	<0.0001	0.0842

note α=0.05。

Figure 2. The comparison of depression between two groups

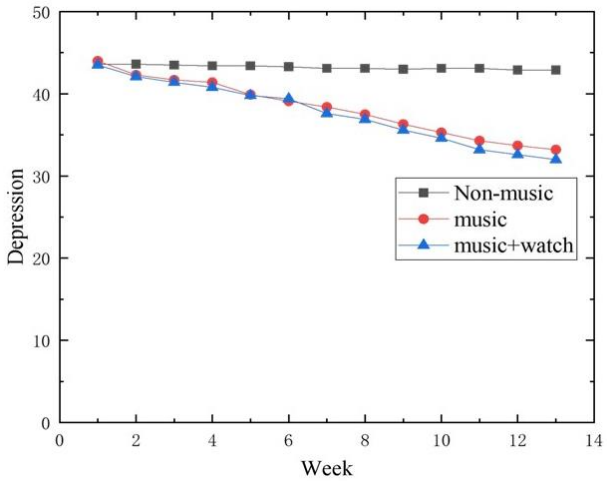


Table 2 shows that the baseline differences in the three groups is not significant. However, the baseline value of depression in the context of COVID-19 is higher than that of our previous study (Pan, 2020). This indicates that COVID-19 has aggravated students' depression. There were significant changes in non-music and music between groups during week five ($p<0.0018$). By the third week, significant differences were seen between the music-

viewing and non-music-viewing groups ($p<0.04$), which also showed that the changes in the music and viewing groups were better than those in the music-only group. These changes were more pronounced, and the effect of depression was reached in a shorter time. After the 13th week of the intervention, the significance value between the music group and the music watching group decreased. This indicates that the significance between them tends to increase. In the subsequent study, we will increase the duration to study whether the effect of the music watching group is more prominent.

Figure 2 compares the outcomes of the three groups after 13 assessment weeks. Depression outcomes in the people who were not subject to music did not significantly change between week one and week 13. From week five, the depression outcomes of the music group and the music watching group progressively decreased. From week 11 to week 13, the depression scores tended to plateau. We simultaneously found that the decline trends of the two groups were similar. However, the results of the music watching group was slightly less as compared to the music intervention group, which also shows that music significantly affects depression treatment.

Discussion

In the authors' previous study (Pan et al., 2020), SD values ranged from 42–43 in the musical and non-musical groups, and 43–44 in the study conducted during COVID-19. This was slightly more than during the non-COVID-19 context. Isolation, traffic control, extended holidays, and large and constant volumes of negative information on the internet during public health emergencies may easily lead to anxiety among individuals (Gao et al., 2003). Research by Murrock and Higgins (2009) suggests that music improves health by evoking psychological responses and changing one's mood. Music perception leads to exciting emotional responses. This suggests that the brain's limbic system engages in the processing of musical stimuli. Such a function is regulated by the rhythm and pitch of the music (Guetin et al., 2009; Guzzetta, 1988). It may, hence, be indicated that music can significantly affect the emotional response of a person. This may affect a human's emotions and mental and physical health. At week five of this trial, a major difference was seen in depression outcomes between the musical and non-musical groups. Gold et al. (2009) studied patients having mental illnesses who received music interventions and systematically reviewed the responses. Their findings resembled ours. During the experiment, depression levels in subjects that received music) were significantly less than people in the non-music group. This demonstrated a decrement that was significant statistically in outcomes of depression gradually in the music intervention receiving group from week five onwards. The outcomes of the music group are significantly different than the control group that did not receive music. This clearly shows that listening to music can significantly impact on the college students' levels of depression. These findings show that music listening can effectively control depression levels in college students. Therefore, music maybe perceived as a convenient and inexpensive way to cope with depression under COVID-19. As a direction for further studies, universities must implement similar researches to regularly assess students' mental health. This study also found that there were major changes in the subjects that received music and the subjects that watched music videos, and the non-music group, which is an interesting phenomenon. The author will continue the experiment and organize it such that everyone participates in the ballet drama. This may result in optimized results of dance interventions on depression.

Limitations

RCT designs are considered the gold standard for establishing validity (Higgins et al., 2019). The study was based on findings from a questionnaire with randomized data collection. However, there is an ongoing debate regarding whether this is the only appropriate design for a psychotherapy study (Holttum & Huet, 2014). Changes within the calculation group, pre- and post-treatment may be limited (Cuijpers et al., 2017; Eysenck, 1963). Additionally, several studies report the benefits of diverse interventions in psychotherapy and counseling. These include psychodynamic short-term therapy, general counseling, and depression counseling, as compared to treatments

such as cognitive behavioral interventions (Cuijpers et al., 2013; Ward et al., 2000; Pybis et al., 2017; Freire et al., 2015; Richards & Bauer, 2011; Steinert et al., 2017;). Furthermore, due to the impact of COVID-19, the control and the experimental group could not physically attend the site, so the experiment was conducted through remote listening and watching. Therefore, the participants may not have been in a similar psychological state, which may have impacted the study results. Moreover, the experiment's sample size was small because it was not sampled in proportion. Further study with a larger sample size is planned by using multivariate technology.

Conclusion

The findings demonstrate that during global emergencies such as COVID-19, more attention should be paid to college students' mental health. Furthermore, psychological health screening and behavior interventions should be actively included in the overall deployment of pandemic prevention and control. This may resultantly guide college students to maintain a healthy lifestyle. To promote college students' physical and mental health, colleges and universities should incorporate music therapy as a subject into their mental health education curriculum. School psychological consultation is an important way to improve college students' mental health, prevent and cure mental diseases, and improve their mental quality. A combination of school education, family upbringing, and personal awareness of healthcare is necessary. The school should promote mental health education to the student and create a balanced study, life, and fitness environment. Parents should provide a healthy environment for their children to develop in and pay attention to their children's mental health from an early age. College students should also master the basic knowledge of psychology and mental healthcare methods, and the three aspects of mutual integration. These jointly promote and improve the level of mental health. The specific approach may be used to set up a psychological counseling center or outpatient services, open consultations via telephone or website. It may be a foundation for questionnaire surveys on freshmen's mental health. It may also be used in developing a psychological file for each student with challenges, where regular psychological counseling session feedback may be recorded.

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Conflict of Interest

There is no conflict of interest from the authors.

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