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Feature Article

Effect of music on depression levels and physiological responses in community-based older adults

Moon Fai Chan,[1] Engle Angela Chan,[2] Esther Mok[2] and Fionca Yuk Kwan Tse[2]
[1]Alice Lee Centre for Nursing Studies, National University of Singapore, Singapore; and [2]School of Nursing, Hong Kong Polytechnic University, Hong Kong, China

ABSTRACT: *Many people over the age of 65 do not regard depression as a treatable mental disorder and find it difficult to express themselves verbally. Listening to music can facilitate the non-verbal expression of emotion and allow people's inner feelings to be expressed without being threatened. The aim of this study was to determine the effect of music on depression levels in elderly people. A randomized controlled study was conducted with 47 elderly people (23 using music and 24 controls) who completed the study after being recruited in Hong Kong. Blood pressure, heart rate (HR), respiratory rate (RR), and depression level variables were collected. In the music group, there were statistically-significant decreases in depression scores (*$P < 0.001$*) and blood pressure (*$P = 0.001$*), HR (*$P < 0.001$*), and RR (*$P < 0.001$*) after 1 month. The implication is that nurses may utilize music as an effective nursing intervention for patients with depressive symptoms in the community setting.*

KEY WORDS: *depression, elderly patient, music intervention.*

INTRODUCTION

Studies have shown that as many as 24% of older adults in the USA and 35% in China report depressive symptoms (Wilson *et al.* 2004; Woo *et al.* 1994). In a comparative study of a middle-age (aged 65 or below) and an old-age (aged 65 and above) group, the prognosis of relapse or recurrence was found to be much more frequent among older patients (Mitchell & Subramaniam 2005). This begs the question of whether continued treatment for depression in older adults is effective. The study indicates that elderly people are at risk of inferior treatment response and poor antidepressant tolerability. This result is consistent with that of another study, which revealed that many older adults were more physically unhealthy and had their activities limited by depression (Ho 2007; Zahran *et al.* 2005).

Correspondence: Moon Fai Chan, Alice Lee Centre for Nursing Studies, National University of Singapore, Block E3A, Level 3, 7 Engineering Drive 1, Singapore 117574. Email: nurcmf@nus.edu.sg
Moon Fai Chan, PhD, CStat.
Engle Angela Chan, PhD, RN.
Esther Mok, PhD, RN.
Fionca Yuk Kwan Tse, MSc, RN.
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Depression and the elderly

Depression can be an early indicator of the presence of one of the aforementioned medical conditions (Wilson *et al.* 2004). Patients with Alzheimer's disease suffer a progressive decline in their stress threshold. Gerdner (1997) proposed a mid-range theory incorporating these elements to discuss the use of individualized music to alleviate agitation. The theory postulated that music would stimulate memory of remote events, and elicitation of memories associated with positive feelings would have a soothing effect and alleviate or decrease agitated behaviours. Within the Chinese community, failure to report a depressed mood to one's physician as a symptom is relatively common (Lai & Good 2005; Yeung *et al.* 2004). The illness beliefs of Chinese patients who are depressed in one study reflected a focus on their physical symptoms and seldom highlighted their depression as their chief concern (Lai 1999). In fact, many patients with depression do not regard it as a treatable mental disorder. Concomitantly, another belief of patients, as suggested by Cheng (1989), is that health professionals are more interested in their physical than their psychological symptoms. Thus, these older, adults with depression may allow their depressive symptoms to go untreated (Cole & Dendukuri 2003). The prevalence of depressive symptoms among elderly Chinese was estimated at 35% in a local study by Woo *et al.* (1994). Older aged Chinese with depression suffer from both emotional and somatic disturbances, but are more likely to focus on their physical problems and believe that their emotional problems result from their physical disturbances (Lai 1999) and poor quality of life (Chan *et al.* 2006). In addition, they find it difficult to express themselves verbally (Chou *et al.* 2006; Woo *et al.* 1994). Music, as a vehicle of feeling, can facilitate the non-verbal expression of emotion. Music can reach people's inner feelings without being threatening and can be a tool for emotional catharsis. Therefore, this study focused on the effects of listening to music on depression in elderly people.

Use of music intervention in health care

The prevalent use of music activity in various settings is well documented in the literature. Existing research on the use of music activity in health-care settings has ranged from acute inpatient care, including surgical care (McCaffrey & Locsin 2004), coronary care (Byers & Smyth 1997; White 1999), critical care (Chlan 1998), and oncology settings (Ezzone *et al.* 1998), to outpatient care, including nursing home settings for agitated residents (Gerdner 1997) and home-care settings for patients with chronic obstructive pulmonary disease (McBride *et al.* 1999), chronic osteoarthritis pain (McCaffrey & Freeman 2003), chronic non-malignant pain (Siedliecki & Good 2006), sleep disturbance (Lai & Good 2005), and depression (Hanser & Thompson 1994). In all these settings, studies have frequently reported that the use of music is perceived as effective and has been commonly employed. Locally, however, studies on the effect of music as a therapy for patients seem to be confined within institutional settings. For instance, surgical patients for music intervention were selected from pre- (Yung *et al.* 2002) or post-operative procedures (Chan 2007), those who suffered from anxiety (Mok & Wong 2003), and those with mechanical ventilation (Chan *et al.* 2008; Lee *et al.* 2005). An investigation into the use of music intervention in the community setting for older adults could enhance our understanding of the use of music intervention.

Entrainment of body rhythms

Haas *et al.* (1986) and Watkins (1997) all indicated that music exerts its effect through the entrainment of body rhythms. Entrainment is defined as the tendency for two oscillating bodies to lock into phase and thus vibrate in harmony (Chlan 1998). This is like individual pulsing heart muscle cells, which when they are brought close together, begin pulsing in synchrony (Haas *et al.* 1986; Watkins 1997). When a person is experiencing discomfort, anger, or stress, their body rhythms, such as breath, heartbeat, and blood flow will change (Lee *et al.* 2005). In a person who is stressed or angry, adrenaline will be released from the adrenal medulla (Smolen *et al.* 2002), affecting their breathing and heart rate (HR) and leading to changes in blood pressure, respiratory rate (RR), HR, and oxygen saturation (Kneafsey 1997). A study by Haas *et al.* (1986) showed that a close relationship was found between musical rhythm and the listener's breath or respiratory patterns. Other studies have suggested that its resolution may be experienced in the listener, physically or emotionally (Hanser & Thompson 1994; Watkins 1997). Their findings supported the entrainment process that is quite evident with music and show that there is potential for the listener's feelings to resonate with the music heard.

THE STUDY

Aims

The aims of the study were to explore the effect of music on levels of depression and physiological parameters in elderly people, with four null hypotheses formulated:

1. There is no significant difference in the reduction of depression levels between the elderly in a music intervention group and those in a control group.
2. There are no significant changes in depression levels among the four time points for the elderly in each group.
3. There is no significant difference in the reduction of physiological measures between the elderly in a music intervention group and those in a control group.
4. There are no significant changes in physiological measures among the four time points for the elderly in each group.

Research design

The design was a randomized controlled study with repeated measures (see Fig. 1), conducted in a community centre in Hong Kong. The chosen centre joined the study voluntarily and shared a similar mission to that of

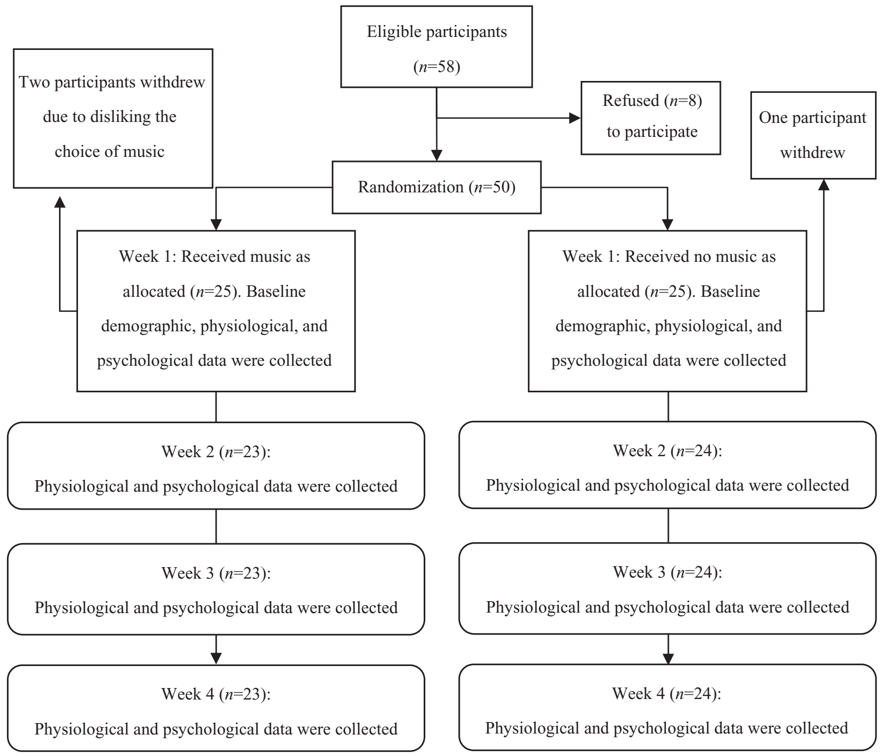

FIG. 1: *Summary of study workflow.*

our team: providing quality services to the elderly in the community. Recent studies have shown that giving participants a choice of music lowered anxiety, promoted relaxation, and led to effective treatment (Lee *et al.* 2005; McCaffrey & Locsin 2004; Yung *et al.* 2002). Therefore, the music chosen by the research team, based on several local studies (Lee *et al.* 2005; Yung *et al.* 2002), included Chinese and Western slow rhythmic music. The data were collected between October and December 2006.

Samples

The power of this study was estimated based on the primary outcome measure, Geriatric Depression Scale (GDS) scores. A two-tailed repeated measures ANOVA design to test for differences between and within groups, interaction effects, and a medium effect size (0.65 for between effects, 0.76 for within effects, and 0.69 for interaction effects) was chosen for this study based on the findings of previous studies (Chiu *et al.* 1994; Lai 1999). The required sample for each group was 25 (the total sample was 50) and this number could achieve 80% power at a 5% level of significance (nQuery Advisor 2001). Assuming a 19% refusal or drop-out rate, the actual samples required were 58. In this study, there were 58 eligible participants, eight of whom refused to participate and 50 who were randomly assigned to either the control or experimental group using a random number generated by a random digits table (Neave 1978). However, two participants in the experimental group refused to continue the 30-min intervention because they did not like the choice of music and one participant in the control group refused to continue due to having no time when the baseline data were being collected. In the end, only 47 participants (23 music and 24 controls) completed the study (see Fig. 1); it reached 5% alpha and a power of 75%. All of the elderly participants were recruited consecutively in the community centre. The inclusion criteria included both male and female participants at a community day-care centre in Hong Kong who were aged 60 years or over.

Study instrument

The study instrument was divided into three parts:

- Part 1. Demographic variables: age, sex, religion, marital status, education level, previous experience of listening to music, and medical history. Data were collected at the baseline in week 1 for all participants
- Part 2. Physiological parameters: a digital monitor was used to collect systolic blood pressure (SBP), diastolic blood pressure (DBP), HR, and RR for each participant. For participants in the experimental group, data were recorded before the 30-min music intervention

as baseline data in week 1. In weeks 2–4, data were recorded after the 30-min music intervention. For participants in the control group, data were recorded once a week for 1 month when they visited the community centre.

- Part 3. Psychological parameters: the GDS (Spreen & Strauss 1998; Yesavage & Brink 1983) was used to collect depression scores. It is a valid and reliable instrument with alpha values ranging from 0.88 (Jongenelis *et al.* 2005) to 0.91 (Parmelee *et al.* 1989), and is one of the most popular tools used in clinical settings. It is available in many languages, including Chinese ($\alpha = 0.92$), has good reliability, and is intended to assess depression in elderly people (Chiu *et al.* 1994). It comprises 30 closed-ended questions, and its focus is on asking how the elderly participants felt during the previous week. One point is assigned to each question, and a summary of all questions yields a total score from 0 to 30. Scores below 9 are considered normal, those between 10 and 19 are mild, and scores above 20 are indicative of a severe level of depression.

Music intervention

The music intervention consisted of a choice of four types of music, with each type played for approximately one 30-min session per week. Each session took place either at the day-care centre or in the participants' homes. The participants were encouraged to listen to the same type of music for 30 min every night before going to sleep. Introduction of the music to participants was accompanied by brief instructions on its correct use. The four types of music were Western classical (Beethoven's Symphony No. 5), Western jazz (April in Paris, Dreamsville), Chinese classical (TAO, Lord of Wind), and Asian classical (Everlasting Road). The tempo of the selected music was 60–80 beats/min without accented beats, percussive characteristics, or syncopation.

Data collection procedure

Using online research randomizer software (Social Psychology Network 2008), the participants were randomly allocated into either the control or music group. After the allocation of participants to groups, baseline data were collected by a nurse researcher. During the study, participants in the experimental group were provided with an MP3 player with earphones in order to listen to the music of their choice from a selection of soft, slow music without lyrics. They were able to adjust the volume to their preference and could decide on their choice of music. Prior to the music listening session, the researcher introduced the music selection to the music group by reading the titles of the music selections and playing a sample tape for each participant. In each case, the participant chose the music they would hear. A quiet room was prepared for the participant, and 5 min before the music intervention, the participants' immediate physiological and psychological data were collected. The researcher then left the participant alone and stayed a short distance away so that they could be available for any unexpected response. After 30 min, the researcher stopped the music, and within 5 and 8 min measured the participants' physiological and psychological data. A CD containing all the music was provided to the participants in the experimental group to listen to at home. During each visit, the participants in the experimental group were asked whether they had listened to the music during the previous week, and the frequency and length of their listening sessions was recorded. Participants in the control group were given an uninterrupted rest period, but the same physiological and psychological data were collected. All the data collection, including administering the intervention and collecting the data, was carried out by the same researcher.

Ethical considerations

Approval was obtained from the ethics committees of the university and the study community centre. A nurse researcher explained the study to potential participants, and written informed consent was obtained beforehand. The participants' personal identity was protected; all data were identified only by a case number, and confidentiality was assured. The participants were given an opportunity to ask questions, and were told that they could withdraw from the study at any point without adverse effects on their subsequent care. All results for this study were reported as aggregates. For those whose baseline GDS scores were high (19 or above), individual reports were sent to the study community centre, and health talks or consulting services were provided to each of them. In addition, extra care was taken to ensure the detection of any possible untoward or unanticipated unpleasant effects from the music. If such effects were noted, the intervention was stopped immediately.

Data analysis

The data were analyzed using SPSS version 12.0 (SPSS, Chicago, IL, USA). Descriptive statistics were used to describe the groups' characteristics. χ^2-test and Fisher's exact tests were used to examine the association between the groups and demographic and health history factors to ensure homogeneity. The Shapiro–Wilk test was used to examine the normality of the physiological and psychological parameters. The results suggested that non-parametric tests were appropriate. In principle, it is believed that parametric tests are more suitable for use with social science data because of their greater power and flexibility to handle multivariate questions compared with non-parametric tests (Hair *et al.* 1998; Munro 2005). However, it has been shown that the use of such techniques with ordinal data rarely distorts the results. In contrast, with non-parametric tests, there is no assumption about the distribution of the outcome and no transformation is required of the data so its original values are retained, thus making interpretation easier. However, the disadvantage of such techniques is their inability to handle multivariate analyses (Munro 2005). In this study, the Mann–Whitney *U*-test was used to determine whether any statistically-significant differences were found for all outcome variables between groups at each time point. The Friedman test was used to test for any statistically-significant changes for each dependent variable among the four time points for each group. The intention-to-treat analysis was used by replacing missing data using the group mean (Little & Rubin 1989). Multiple comparisons were performed to compare each pair, that is, baseline versus week 2, baseline versus week 3, and baseline versus week 4; the level of significance was set at $P < 0.001$.

FINDINGS

Demographic and health history variables

There were 58 eligible participants, eight of whom refused to participate. However, two participants in the experimental group refused to continue during the 30-min intervention because they did not like the choice of music. Also, one participant in the control group refused to continue due to having no time when the baseline data were being collected. Therefore, the demographic and health data for only 47 participants are presented in Table 1. The majority were aged 75 or above ($n = 21$, 44.8%); 55% ($n = 26$) were female and 95.7% ($n = 45$) were married. More than half of the participants

TABLE 1: *Demographic data of study sample by group*

			Group			
	Total ($n = 47$)		Control ($n = 24$)		Experimental ($n = 23$)	
Variables	n	(%)	n	(%)	n	(%)
Age (years)						
60–64	9	(19.1)	4	(16.7)	5	(21.7)
65–69	8	(17.0)	4	(16.7)	4	(17.4)
70–74	9	(19.1)	5	(20.8)	4	(17.4)
75–79	11	(23.4)	6	(25.0)	5	(21.7)
80+	10	(21.4)	5	(20.8)	5	(21.7)
Sex						
Male	21	(44.7)	11	(45.8)	10	(43.5)
Female	26	(55.3)	13	(54.2)	13	(56.5)
Marital status						
Married	45	(95.7)	23	(95.8)	22	(95.7)
Widow/widower	2	(4.3)	1	(4.2)	1	(4.3)
Education level						
Illiterate	27	(57.4)	14	(58.3)	13	(56.5)
Primary	13	(27.7)	7	(29.2)	6	(26.1)
Secondary or above	7	(14.9)	3	(12.5)	4	(17.4)
Religious belief						
No	19	(40.4)	10	(41.7)	9	(39.1)
Yes	28	(59.6)	14	(58.3)	14	(60.9)
Catholic	4	(14.3)	2	(14.3)	2	(14.3)
Christian	6	(21.4)	2	(14.3)	4	(28.6)
Buddhist	18	(64.3)	10	(71.4)	8	(57.1)
Tried music therapy before						
Yes	3	(6.4)	1	(4.2)	2	(8.7)
No	44	(93.6)	23	(95.8)	21	(91.3)
Diseases						
Respiratory (Yes)	11	(23.4)	5	(20.8)	6	(26.1)
Hypertension (Yes)	30	(63.8)	16	(66.7)	14	(60.9)

were illiterate ($n = 27$) and had religious beliefs ($n = 28$, 59.6%). Less than 7% had tried music intervention ($n = 3$). With regard to their health history, more than 60% had hypertensive disease ($n = 30$) and 23% had respiratory problems ($n = 11$).

Psychological measures

For hypothesis 1, the Mann–Whitney *U*-test was used to determine whether there were statistically-significant differences in the participants' depression scores for the two groups at each time point. As shown in Table 2 and Figure 2e, no such differences were found at baseline ($P = 0.783$) and week 1 ($P = 0.061$), but statistically-significant differences were found at weeks 3 ($P < 0.001$) and 4 ($P < 0.001$) between the experimental and the control group. For hypothesis 2, the Friedman test was used for each group to determine any statistically-significant changes in the depression score between the four time points. The control group showed a statistically-significant increase at week 4 (mean = 15.8, SD = 4.0) compared with baseline (mean = 13.4, SD = 4.4, $P = 0.007$). For the experimental group, there was a

TABLE 2: *Comparison of outcome measures by groups using intention-to-treat analysis*

	Group†					
	Control ($n = 25$)		Experimental ($n = 25$)		Mann–Whitney *U*-test	
Outcomes	Mean (SD)	Median (range)	Mean (SD)	Median (range)	*U*	*P*-value
Systolic blood pressure						
Baseline	143.7 (22.1)	147.0 (77.0–186.0)	143.8 (23.8)	148.0 (77.0–173.0)	480.20	0.451
Week 2	138.4 (25.1)	137.0 (87.0–204.0)	138.1 (25.0)	144.0 (87.0–171.0)	552.50	0.816
Week 3	141.4 (26.4)	141.0 (87.0–210.0)	136.4 (20.9)	141.0 (86.0–163.0)	385.50	0.044
Week 4	140.9 (26.4)	142.0 (70.0–204.0)	130.1 (21.8)	138.0 (95.0–100.0)	341.50	0.011
Friedman test	$\chi^2 = 12.33$, $P = 0.111$		$\chi^2 = 21.71$, $P < 0.001$*			
Multiple comparisons‡	A ($P = 0.033$), B ($P = 0.112$), C ($P = 0.224$)		A ($P = 0.021$), B ($P < 0.001$*), C ($P = 0.001$*)			
Diastolic blood pressure						
Baseline	72.7 (12.8)	79.0 (50.0–92.0)	73.1 (11.5)	76.0 (48.0–91.0)	491.00	0.514
Week 2	71.1 (11.1)	68.0 (55.0–95.0)	72.6 (11.8)	75.0 (55.0–97.0)	469.50	0.314
Week 3	71.7 (11.8)	72.0 (48.0–91.0)	70.7 (15.3)	73.0 (37.0–95.0)	414.00	0.310
Week 4	71.4 (13.6)	74.0 (54.0–97.0)	67.7 (14.0)	70.0 (46.0–97.0)	301.50	0.001*
Friedman test	$\chi^2 = 2.39$, $P = 0.506$		$\chi^2 = 17.93$, $P = 0.001$*			
Multiple comparisons‡	A ($P = 0.217$), B ($P = 0.310$), C ($P = 0.355$)		A ($P = 0.021$), B ($P = 0.003$*), C ($P < 0.001$*)			
Heart rate						
Baseline	77.3 (10.4)	78.0 (50.0–100.0)	72.7 (14.1)	77.0 (46.0–100.0)	421.50	0.113
Week 2	74.7 (12.7)	77.0 (51.0–104.0)	71.3 (14.5)	76.0 (46.0–104.0)	423.00	0.213
Week 3	79.4 (10.3)	78.0 (55.0–104.0)	67.5 (15.0)	68.0 (46.0–104.0)	264.50	<0.001*
Week 4	79.8 (11.0)	79.0 (56.0–106.0)	65.5 (17.1)	61.0 (40.0–106.0)	266.00	<0.001*
Friedman test	$\chi^2 = 14.16$, $P = 0.001$*		$\chi^2 = 18.94$, $P < 0.001$*			
Multiple comparisons‡	A ($P = 0.004$*), B ($P = 0.010$*), C ($P = 0.019$)		A ($P = 0.180$), B ($P = 0.001$*), C ($P = 0.002$*)			
Respiratory rate						
Baseline	22.7 (6.9)	21.0 (13.0–37.0)	22.5 (7.2)	18.0 (15.0–36.0)	462.00	0.419
Week 2	21.3 (4.2)	19.0 (12.0–32.0)	18.5 (4.4)	18.0 (11.0–33.0)	348.00	0.012
Week 3	23.0 (7.5)	18.0 (15.0–40.0)	17.5 (6.2)	16.0 (10.0–36.0)	228.00	<0.001*
Week 4	21.3 (6.5)	19.0 (12.0–42.0)	18.0 (5.6)	15.0 (12.0–35.0)	201.00	<0.001*
Friedman test	$\chi^2 = 11.29$, $P = 0.141$		$\chi^2 = 19.99$, $P < 0.001$*			
Multiple comparisons‡	A ($P = 0.130$), B ($P = 0.291$), C ($P = 0.149$)		A ($P = 0.005$*), B ($P < 0.001$*), C ($P = 0.001$*)			
Geriatric Depression Scale						
Baseline	13.4 (4.4)	15.0 (4–21)	13.1 (5.2)	16.0 (5–22)	524.50	0.783
Week 2	13.3 (5.1)	14.0 (6–20)	11.0 (4.2)	12.0 (4–19)	383.00	0.061
Week 3	14.4 (6.4)	15.0 (5–22)	9.8 (3.4)	10.0 (3–16)	210.00	<0.001*
Week 4	15.8 (4.0)	17.0 (8–23)	7.9 (3.5)	8.0 (4–11)	201.00	<0.001*
Friedman test	$\chi^2 = 17.93$, $P = 0.001$*		$\chi^2 = 20.93$, $P < 0.001$*			
Multiple comparisons‡	A ($P = 0.012$), B ($P = 0.251$), C ($P = 0.007$*)		A ($P = 0.012$), B ($P = 0.001$*), C ($P = 0.001$*)			

Geriatric Depression Scale (Chinese version) ranging from 0 to 30; the higher the score, the more depressed the participant. *$P < 0.001$. †Group: one missing data in control group and two missing data in experimental group, thus replaced by group mean; ‡A, baseline versus week 2; B, baseline versus week 3; C, baseline versus week 4.

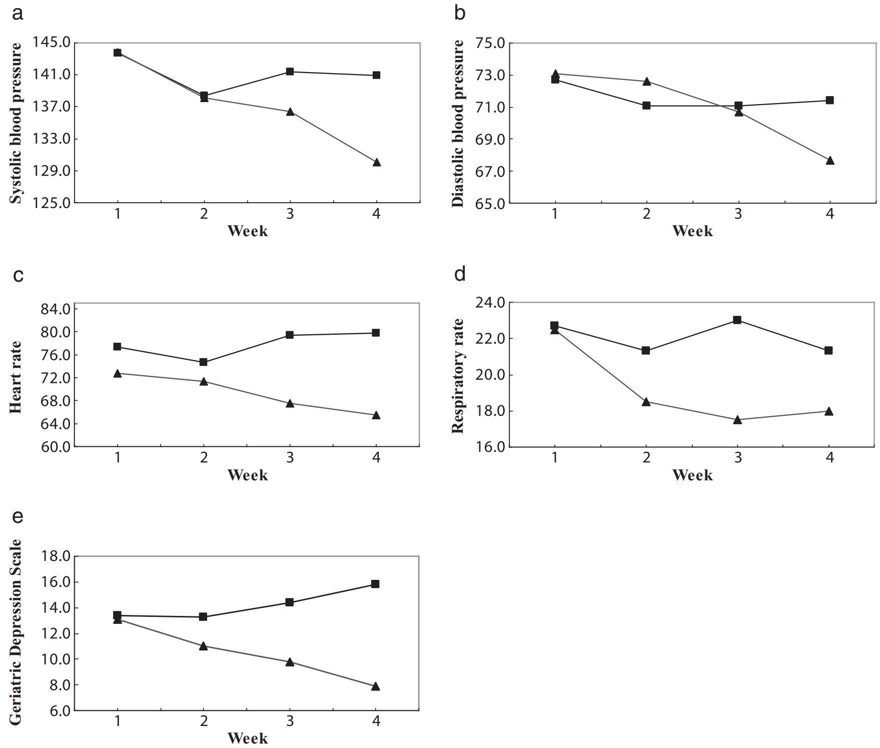

FIG. 2: *Weekly comparison of (a) systolic blood pressure, (b) diastolic blood pressure, (c) heart rate, (d) respiratory rate, and (e) Geriatric Depression Scale between groups. –■–, Control group; –▲–, Experimental group.*

statistically-significant reduction in the depression score at week 4 (mean = 7.9, SD = 3.5) compared with baseline (mean = 13.1, SD = 5.2, $P = 0.001$).

Physiological measures

For hypothesis 3, the Mann–Whitney *U*-test was used to determine whether there were statistically-significant differences for all physiological variables between the two groups at each time point. As shown in Table 2 and Figure 2a–d, for the baseline and week 2, no statistically-significant differences were found for any of the variables between the two groups. In week 3, statistically-significant differences were found between the two groups for HR ($P < 0.001$) and RR ($P < 0.001$). In week 4, statistically-significant differences were found between groups in DBP ($P = 0.001$), HR ($P < 0.001$), and RR ($P < 0.001$). For hypothesis 4, the Friedman test was used to determine any statistically-significant changes for each physiological variable among the four time points for all groups. For the control group, no statistically-significant differences were found for SBP ($P = 0.111$), DBP ($P = 0.506$), and RR ($P = 0.141$), but statistically-significant increases were found for HR ($P = 0.001$). For the experimental group, statistically-significant reductions were found in SBP ($P = 0.001$), DBP ($P < 0.001$), HR ($P = 0.002$), and RR ($P = 0.001$).

DISCUSSION

Music stimuli exert a biologically meaningful effect on human behaviour by engaging specific brain functions involved in memory, learning, and multiple motivational and emotional states (Haas *et al.* 1986). Hanser and Thompson (1994) pointed out that music evokes psychophysiological responses because of its influence on the limbic system. The fact that perception of music leads to stirring emotional experiences is an indicator that the limbic system is engaged in processing music stimuli, and that this system is influenced by musical pitch and rhythm. Thus, people's emotional reaction to music may occur because the limbic system is the neurophysiological location of emotional states, feelings, and sensations. Haas *et al.* (1986) and Watkins (1997) indicated that music exerts its effect through the entrainment of body rhythms. When a person is experiencing discomfort or stress, their body rhythms, such as breath, heartbeat, and blood flow, will change. When a person is stressed or angry, adrenaline will be released from the adrenal medulla, affecting their breathing and heartbeat, leading to a change of blood pressure, RR, and HR. Life is always fraught with depression, which in turn influences the physiological and psychological reactions of the elderly (Lai 1999; Tse & Bond 2004; Woo *et al.* 1994; Yeung *et al.* 2004). Their findings support the entrainment process that is quite evident with music, and show that music has the potential to resonate with the listener's feelings. The beneficial effect of music for the older people was demonstrated in this study. The findings show that music can exert a soothing effect on the stress-induced physiological and psychological responses of participants receiving this intervention. In the psychological measure, there was a statistically-significantly higher depression score for the control group than the experimental group at week 4. The depression level in the control group did not change within the mild depression range during the 4 weeks, but changes were found in the experimental group, from mild to normal levels. Among the physiological measures, including DBP, HR, and RR, there was a statistically-significant reduction in the experimental group. In addition, there were statistically-significant differences at weeks 3 and 4 in the values for DBP, RR, and HR between the two groups. Participants in the experimental group had greater reductions in these values than those in the control group.

Implications for practice

The results of this study have significant implications for the clinical practice of nursing. Listening to music may act as an effective intervention to allay depression levels in the elderly if they are willing to accept it. In practice, community nurses can encourage elderly patients to listen to music as an alternative self-care skill, enabling them to release their negative feelings and develop a healing process in their daily lives.

Study limitations

As with most studies, there were limitations to this one that affected its outcomes. One potential limitation is that the same researcher administered the intervention and collected the data, which had the potential to bias the results. Therefore, it is recommended that each of these tasks be carried out by a different researcher. Second, the study could not distinguish whether the reductions in physiological and depression levels in the experimental group were due to the chosen music or the placebo effect. A study by Lai (1999) saw control group participants listen to pink sound for 30 min instead of no music, pink sound being a specific spectrum of frequencies of sound that is narrowed or bent from white noise. Therefore, it is suggested that a further study be conducted with the inclusion of a placebo group to examine this possible placebo effect. Third, a small sample size and a non-attention control group may not be generalisable, which may affect the findings due to external validity. For example, the participants may or may not have listened to music during the study period, so that the significant results may not have been due only to the 30-min music intervention; any further study should therefore recruit more older people people from different centres.

CONCLUSION

Music intervention is a non-invasive and inexpensive nursing intervention. It may help nurses build therapeutic relationships with elderly patients, and nurses are encouraged to use music as part of their holistic caring for these patients. This study has shown that music is an effective method of reducing physiological and depression responses arising in a group of older people.

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