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Effects of Progressive Muscle Relaxation with Music and Aromatherapy on Decreasing Stress Levels among Teachers

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ABSTRACT

Background: Stress among teachers has a significant relationship with the psychosomatic and depressive symptoms. Progressive muscle relaxation with music and aromatherapy is an intervention which can be implemented to reduce the level of stress among teachers.

Purpose: This study aimed to investigate the effects of progressive muscle relaxation with music and aromatherapy on decreasing the level of stress among teachers.

Methods: This study employed a pre-posttest quasi-experimental design with a control group. The samples were 46 teachers recruited by purposive sampling and were evenly assigned to the intervention group and the control group. Progressive muscle relaxation with music and aromatherapy was given to the intervention group for four sessions in four days; each lasted for 20 minutes. The data were collected using the Teacher Stress Inventory and analyzed using the t-test to know the effects of the intervention.

Results: The results showed that the mean of stress level among the teachers in the intervention group decreased from 50.65 ± 3.761 to 32.78 ± 8.426 after the intervention. Meanwhile, in the control group, the mean of stress level slightly decreased from 49.87 ± 3.348 to 49.17 ± 4.868 . The t-test obtained a p-value of 0.000, indicating that there were significant differences in the stress levels between the intervention and the control group.

Conclusion: Progressive muscle relaxation with music and aromatherapy reduced the level of stress among teachers. Based on the findings, it is recommended that community nurses promote this relaxation therapy to decrease the stress level among school teachers.

Keywords: Aromatherapy; music; progressive muscle relaxation; teacher stress

BACKGROUND

Work stress is one of the health problems that often occurs in teachers. International Labour Organization in 2016 mentioned that one of the highest prevalence of work stress occurs in the education sector (International Labour Organization, 2016). Furthermore, the Health and Safety Executive (2016) reported that in the teaching profession, there are about 2,530 cases of stress per 100,000 teachers. It means that among 465,112 teachers of high school and vocational school in Indonesia, there are approximately 11,767 cases of stress (The Central Statistic Agency, 2015). The high number of cases of teacher stress indicates that there is a problem in the society's mental health that should be solved.

Teachers indeed have a very important role in improving the quality of education of a nation (Seth, 2016). However, when teachers experience stress, there will be some unfavorable effects on the learning process and the quality of the educational institution. Results of a study conducted in Turkey showed a significant negative relationship between stress levels of teachers and the health of educational organizations (Sabanci, 2015). Moreover, another study by Mclean and Connor (2016) reported that teachers who had depressive symptoms caused poor quality of learning in the classroom. Teachers' emotional fatigue affects the teachers' perceived support and the teachers' depersonalization with the development of student motivation (Shen, Mccaughtry, Martin, Gam, Kulik, & Fahlman, 2015). Teacher work stress can also affect the physical and mental health of teachers. Results of previous studies indicated that increased work stress raised psychosomatic problems and depressive symptoms (Chang & Min, 2009; Madhura, Subramanya, & Balaram, 2014). Teachers who experience work stress will try to protect themselves by self-withdrawal, absent, decreased performance, loss of commitment, dissatisfaction at work, and interpersonal conflict (Seferoğlu, Yıldız, & Yücel, 2014).

Community nurses can help teachers address the problem of stress at work. In this context, the nurses may provide psychosocial support to the teachers to deal with the issue of occupational stress in the form of prevention which focuses on individual workers. One of the efforts which can be made is through nursing complementary interventions (Snyder & Lindquist, 2006). A common complementary intervention which has been widely used to deal with the problem of work stress is progressive muscle relaxation (PMR). A study by Sundram, Dahlui, and Chinna (2016) reported a significant reduction in the level of stress among male workers after given the PMR. Similarly, progressive muscle relaxation with music was reported to increase the focus of attention and reduce mental tension (Robb, 2000). The reduction in stress levels showed the potential of PMR therapy as a coping strategy at the workplace.

In addition to PMR, other complementary therapies which can reduce stress include music therapy and aromatherapy. Listening to music prior to a standardized stressor predominantly affects the autonomic nervous system (in terms of a faster recovery) and a lesser degree the endocrine and psychological stress response (Thoma, la Marca, Brönnimann, Finkel, Ehlert, & Nater, 2013). Music affects the body relaxation by reducing the activity of alpha-amylase and systolic blood pressure (Linnemann, Ditzen, Strahler, Doerr, & Nater, 2015). Aromatherapy describes the use of essential oils from various plants which are beneficial to improve the physical and psychological state of an individual (McCabe & Jacka, 2001). Previous studies reported that aromatherapy improved mood (Linnemann et al., 2015) and decreased stress (Toda & Morimoto, 2011). Unfortunately, there have been limited studies which investigate the effects of progressive muscle relaxation with music and aromatherapy to cope with work stress. Thus, it is necessary to conduct a study which explores the effects of such combination of interventions on teachers' stress.

PURPOSE

This study aimed to examine the effects of progressive muscle relaxation intervention with music and aromatherapy on decreasing the level of stress among teachers.

METHODS

This study used a pretest-posttest quasi-experimental design with a control group. The samples were 46 teachers from two vocational high schools in Manggarai regency in East Nusa Tenggara, Indonesia. The samples were assigned into two groups: the intervention group that received progressive muscle relaxation with music and aromatherapy (n=23), and the control group which did not receive such intervention (n=23). The samples were recruited using purposive sampling. The inclusion criteria included teachers who were favorable to lavender aromatherapy and relaxation music and experienced a moderate level of stress. The exclusion criteria were teachers having other stress management therapy, and experiencing severe and acute heart disease, pain, infection or inflammation of the musculoskeletal, and hearing loss.

Prior to the study, the researchers conducted an initial screening using the Teacher Stress Inventory (TSI) to determine the level of stress in teachers subjectively. The TSI questionnaire was administered to 75 teachers in two vocational high schools. Results indicated that the respondents who met the inclusion and exclusion criteria were 46. Objective measurement of stress was also conducted using a cocoro meter to check the alpha amylase concentration in the saliva as an indicator of stress. If the result is 0-30 KU/L (kilo unit per liter), it means that the respondent is happy and does not have stress. A result of 30-45 KU/L means the respondent is slightly stressed; 45-60 KU/L means the respondent experience stress, and 60 KU/L means the respondent has severe stress (Ariyanto, Wahyuning, & Desrianty, 2015).

The intervention in this study was progressive muscle relaxation intervention with music and aromatherapy which was administered for four sessions in four consecutive days. The duration of each session was 20 minutes. Aromatherapy through inhalation works best using a vaporizer or diffuser. The use of diffuser was preferable in this study as it can spray different molecules at the same time. A 3% concentration of lavender oil was used. In total, 20 drops of lavender oil were mixed with 50 ml of water. The diffuser containing aromatherapy was turned on half an hour before the intervention. In this research, the researcher also played the music of Pachelbel Canon in D Major. This music had a regular rhythm, less than 80 beats per minute, lacked extreme tones, smooth and flowing melodic sounds. During the intervention, the music was also played for 20 minutes. Objective and subjective measurement were performed before and after the intervention. The collected data were analyzed using the t-tests.

The study was approved by the research ethics committee of the Faculty of Medicine, Diponegoro University, and the schools where the study took place. All respondents were informed of the purpose of the study and consented for their participation in the study.

RESULTS

The characteristics of respondents included age and years of teaching, sex, education, and marital status. Based on Table 1, the majority of teachers were males, bachelor degree holders and married. Most of them were employed by the school foundation. The mean of age in the intervention and control group was 32.43 and 32.83, respectively. The mean of years of teaching in the intervention and control group was 6.43 and 6.78, respectively.

Table 1. Characteristics of respondents (n=46)

Variable	Intervention Group		Control Group		Total	
	n	%	n	%	n	%
	Sex					
Male	14	60.9	13	56.5	27	58.7
Female	9	31.9	10	43.5	19	41.3
Education						
Associate degree	1	4.3	1	4.3	2	4.3
Bachelor degree	22	95.7	22	95.7	44	95.7
Status of Marriage						
Single	7	30.4	6	26.1	13	28.3
Married	16	69.6	17	73.9	33	71.7
Status of Employment						
Honorary	2	8.7	2	8.7	4	8.7
Government employees	1	4.3	2	8.7	3	6.5
Employees of foundation	20	87	19	82.6	39	84.8
Age ($M\pm SD$)	32.43 \pm 6.88		32.83 \pm 7.63			
Years of teaching ($M\pm SD$)	6.43 \pm 5.84		6.78 \pm 6.22			

Table 2. The mean of stress among teachers in the intervention group and control group using cocoro meter

Group	Time of measurement	n	Mean	SD	Min-Max	CI
Intervention	Pre test	23	50.65	3.761	45-59	
	Post test	23	32.78	8.426	21-54	49.03-52.28
Control	Pre test	23	49.87	3.348	45-57	29.14-36.43
	Post test	23	49.17	4.868	36-58	48.42-51.32
						47.07-51.28

Table 2 shows that the stress value among teachers before the intervention in the intervention was 50.65 kU/L, while in the control group was 49.87 kU/L. After the intervention, the stress value among teachers in the intervention group decreased to 32.78 kU/L, meaning that teachers did not experience stress. Meanwhile, in the control group, the stress value slightly decreased (49.17 kU/L).

Table 3. Mean difference of teacher stress after the intervention in the intervention group and control group

Group	n	Mean	SD	Variants	p-value
Intervention	23	32.78	8.426	0.013	0.000
Control	23	49.17	4.868		

Based on Table 3, there was a significant difference in the level of stress among teachers after the progressive muscle relaxation with music and aromatherapy on in the intervention group and control group ($p=0.000$). It indicates that the intervention was effective to decrease teacher stress.

DISCUSSION

The results of this study proved that there was a significant effect of progressive muscle relaxation with music and aromatherapy on decreasing the level of stress among teachers. This is in line with a previous study which reported that progressive muscle relaxation could reduce cortisol levels by an average decrease of 0.013 units per 15 days ($p=0.039$) (Linnemann, Ditzen, Strahler, Doerr, & Nater, 2015). Music therapy and lavender aromatherapy give effects on the stress management by decreasing the alpha-amylase activity (Hur, Song, Lee, & Soo, 2014). Muscle relaxation combined with music can increase the focus of participant attention and reduce mental tension; music encourages the body becomes more relaxed and able to motivate participants to follow a relaxation program (Robb, 2000). Meanwhile, aromatherapy has been proven to be a supportive therapy which improves mood and sense of comfort (Linnemann et al., 2015).

Another study by Robb (2000) also showed a decrease of the mean of State Anxiety Inventory (STAI) in the group receiving progressive muscle relaxation intervention with music by 15.54, whereas in only music and muscle relaxation intervention, the decrease of STAI is only 9.20 and 11.06. This proves that progressive relaxation techniques with music are more effective than using progressive relaxation or music techniques only (Robb, 2000).

Another study examining the combination of relaxation therapy showed that mindfulness intervention combined with room aromatherapy can decrease the stress by 32.9%. This study proves that aromatherapy increases awareness during meditation (Redstone, 2015). Similarly, Davis and Nurse (2005) reported that a combination of aromatherapy interventions in reducing muscle tension through massage therapy with music suggests a significant decrease in anxiety.

Progressive muscle relaxation is a relaxation technique aimed at reducing muscle energy use. Stress was related to the reporting of musculoskeletal pain which involved head pain (35.2%) and back pain (31.9%) (Østerås, Sigmundsson, & Haga, 2015). Through progressive muscle relaxation interventions, there is a relaxation of the skeletal muscle which impacts on the relaxation of visceral muscles so that the body's consumption of oxygen, the speed of metabolism, respiratory rate, muscle tension, systolic and diastolic blood pressure decreased (Bernstein, Borkovec, Hazlett-stevens, & Douglas, 2000).

The process of relaxation in skeletal muscles that impacts on visceral muscle relaxation becomes more leverage with the help of relaxation music. Music provides a stimulus to decrease muscle energy. The results of other studies showed that music could reduce the activity of alpha-amylase and systolic blood pressure (Linnemann, Ditzen, Strahler, Doerr, & Nater, 2015). Decreased alpha-amylase activity through music is influenced by the elements contained in the music. The type of music used by researchers in this study is the type of music Pachelbel's 'Canon' and stress relief that has a slow frequency, regular rhythm with a tempo less than 80 beats. Elements contained in the music used to affect the response of relaxation respondents. This is in line with studies that show an increase in brain-derived neurotrophic factor (BDNF) that functions in controlling

anxiety and emotions after being given intervention with a low rhythm and mild tempo of 50-60 dB (Angelucci, Ricci, Padua, Sabino, & Attilio, 2007).

The additional intervention other than PMR and music used in this study is lavender aromatherapy. Other studies showed that aromatherapy relaxed breathing muscles and made breathing rhythms more regular. Moreover, the use of lavender aromatherapy is effective in improving mood and provide a sense of comfort (Linnemann et al., 2015). Aromatherapy lavender can lower the level of salivary cortisol that indicates decreased stress (Toda & Morimoto, 2011).

The PMR intervention with music and aromatherapy performed in this study was conducted in 4 sessions for four days. The results showed that the effect of the intervention was seen to be significant between before and after the intervention within that period. The results of this study were supported by studies that showed a decrease in blood pressure, electromyography, anxiety, and fatigue after the provision of progressive muscle relaxation with music for four sessions of exercise (Jose & Almeida, 2013; Kyung, 2010).

CONCLUSION

The stress of teacher respondents decreased after given PMR with music and aromatherapy in the intervention group. Whereas in the control group, the level of stress remained almost similar before and after the intervention. Nurses can implement PMR with music and aromatherapy in the workplace as one of the occupational health services and work together with the educational authorities to open opportunities for nurses to implement relaxation interventions as an effort to prevent occupational stress.

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