The Relationship between Type of Music and Anxiety Level among Malaysian Women during Mammography

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ABSTRACT

Music is one of the suggested interventions that can reduce stress caused by pain from mammography procedures. The different types of music might affect the anxiety level during a mammogram screening. Thus, the study aimed to determine the anxiety level of women who underwent mammogram screening according to different types of music. A cross-sectional study was conducted on 60 women by using the purposive sampling technique in the radiology department at randomly selected private hospitals in Klang Valley from November 2018 to November 2019. Respondents were randomly divided based on the day of mammogram screening into two groups; namely slow and upbeat music. Descriptive analysis was used to determine the anxiety level for each group and T-test analysis was used to compare the significance of anxiety level between both groups. A total of 60 respondents had participated in this study with a total of 30 (50.0%) respondents allocated in slow music, while another 30 (50.0%) respondents were allocated in upbeat music. Patients who underwent mammography screening while listening to slow music had a high anxiety level (70.0%) as compared to upbeat music group (63.3%). There was no significant effect for music, $t(60) = -0.54$, $p = 0.59$, despite slow music ($M = 1.70$, $SD = 0.47$) attaining higher anxiety level than the upbeat music ($M = 1.63$, $SD = 0.49$). Upbeat music has the potential in reducing the anxiety level of women undergoing mammography screening.

Keywords: Mammogram; upbeat music; slow music; anxiety

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INTRODUCTION

Mammography is a primary and standard screening tool to detect breast cancer as compared to breast self-examination and clinical breast examination (Al-Naggar & Bobryshev, 2013). Mammography involves compression that inflicts pain, discomfort, and anxiety, which may influence a woman's decision to not return for repeat screenings (Poulos & Llewellyn 2005). In addition, undergoing certain diagnostic procedures, such as mammography, may cause people to think about serious results, felt tense and nervous or had a fear of breast cancer diagnosis had higher anxiety levels (Bolukbas et al. 2010).

Relaxation techniques have been used successfully in the treatment of numerous physical and psychologic disorders (Domar et al. 2005). In the study the effects of relaxation techniques for reducing pain and anxiety during screening mammography were studied by using music as relaxation techniques. This relaxation techniques were also used in other medical procedure and one of them by Wakim et al.'s (2010) which multiple studies showed that patients who listened to music before, during, or after general anesthesia had decreases in blood pressure and heart rate, and also lower anxiety scores.

Music is one of the interventions that has been broadly used since ancient time to improve the psychological effect of the well-being of patients as well as reduce stress caused by anxiety. Music directly influence the physiological outcome in the autonomic

nervous system and indirectly influence the caregiver behaviour in handling patient (Kemper & Danhauer 2005). Music is always referred as the "language of emotion" (Corrigall & Schellenberg 2013). Listeners may sometimes experience a more positive or pleasant emotions when listening to sad-sounding music (Kawakami et al. 2014; Taruffi and Koelsch 2014; Sachs, Damasio & Habibi 2015). However, when it comes to music, individuals have different tastes of music (Rentfrow et al. 2011). Music preference is categorised into two, which are music genre and music attribute. A particular music style is classified as music genre, such as rock, pop or jazz. Meanwhile, the preference for music with a certain psychological or auditory feature is classified as music attributes, such as fast, slow, happy or relaxing (Fricke & Herzberg 2017). Therefore, different types of music might affect the anxiety level during medical screening.

However, there were limited scientific research that focus on the use of music intervention to reduce the anxiety level for women undergoing mammogram screening (Zavotsky et al. 2014). This study will subtly support the theory of using different types of music intervention as a way to help in reducing the anxiety of women during mammogram screening. The finding of this study will serve as baseline data for further improvement in breast screening programme, and thus recommend a suitable music type for the implementation of music therapy during mammogram screening in the hospital setting.

EXPERIMENTAL METHODS

STUDY DESIGN AND POPULATION

A cross sectional study was conducted from November 2018 to November 2019 at three randomly selected private hospitals in Klang Valley. A total of 60 respondents aged 40 and above who had attended mammography screening was chosen using purposive sampling technique. Patients were divided into two groups based on the day of the mammogram screening, in which it was blinded and under the radiographer's control. The songs were selected upon agreement of the discussion among members based on the literature (Fricke & Herzberg 2017). The music then was respectively played to the respondents at 60dB during the mammogram screening.

DATA COLLECTION

Each participant was given a set of validated questionnaire (α = 0.77) that contained of 20 questions in English language that need to be answered after mammography screening was done. The "State-Trait Anxiety Inventory'

form adapted from Spielberger (1986) was used for data collection. The form has been translated into Malay language and has been back translated by two language experts. This is to ensure that the respondents understand the questions. The questions in this form were assessed based on the degree of anxiety; 1 was denoted as 'not at all', 2 was 'somewhat', 3 was 'moderately so' and 4 was denoted as 'very much so'. Twenty questions were summed up to calculate the score for the patient's anxiety level.

ETHICAL CONSIDERATION

Permission was obtained from the Institutional Review Board with a registration number (KPJUC/RMC/SOHS/EC/2019/225) and Diagnostic Imaging Service at three selected hospitals in Klang Valley. The respondents had consented to participate prior to any intervention or data collection.

STUDY INSTRUMENT

The mammography suite was equipped with an adjustable speaker (Yamaha EMX5016CF-input Powered Mixed with dual 500W), laptop and cable. The mammography units used were GE Healthcare Alpha RT unit, Philip Mammo Diagnost AR unit and SIEMENS Mammomat Inspiration unit.

STATISTICAL ANALYSIS

A total of 20 questions were summed up to measure the marks for the patient's anxiety level. The total score was categorised as low (20-23 marks), moderate (24-46 marks) and high (47-80 marks) anxiety levels. Descriptive analysis was used to determine the anxiety level among women who underwent mammogram screening with upbeat and slow music. T-test analysis was used to compare the significance of anxiety level and type of music between both groups. Data were analysed using the Statistical Package for the Social Sciences (SPSS) Version 23 and Microsoft Excel.

RESULTS

A total of 60 sets of questionnaire were fully answered. Table 1 shows the socio-demographic data of the respondents. The mean age of the respondents in upbeat music group was 55.0(±10.2) and for slow music group was 50.3(±7.4). Overall, the majority of respondents was Malays (46.7%) and Chinese (46.7%), followed by 6.7% Indians. Married women (78.3%) comprise large proportion of total respondents. Furthermore, majority of the respondents (35.0%) came for their second round of screening mammogram.

TABLE 1 Socio-demographic data (*n* = 60)

| Variable	*n*	*%*
Music		
Upbeat Music	30	50.0
Slow Music	30	50.0
Race		
Malay	28	46.7
Chinese	28	46.7
Indian	4	6.7
Others	0	0
Religion		
Islam	30	50.0
Buddha	18	30.0
Hindu	4	6.7
Christian	8	13.3
Others	0	0
Marital Status		
Single	3	5.0
Married	47	78.3
Divorced	1	1.7
Widowed	9	15.0
Have you done mammogram before?		
First time	20	33.3
Second time	25	41.7
More than 2 times	15	25.0
Do you have family history of breast cancer?		
Siblings	6	10.0
Daughter	0	0
Mother	9	15.0
Maternal aunt	3	5.0
Paternal aunt	1	1.7
Maternal grandmother	1	1.7
Sibling same father	0	0
Sibling same mother	0	0
Paternal grandmother	0	0
Others	0	0
No	40	66.7
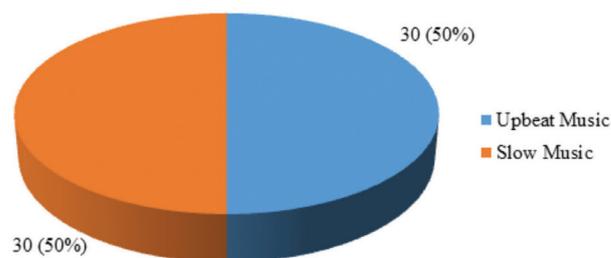
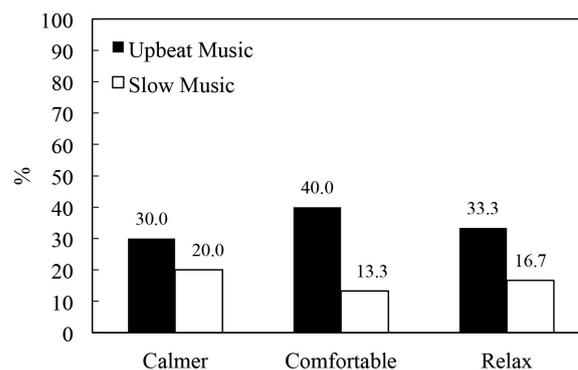FIGURE 1 Total number of respondents

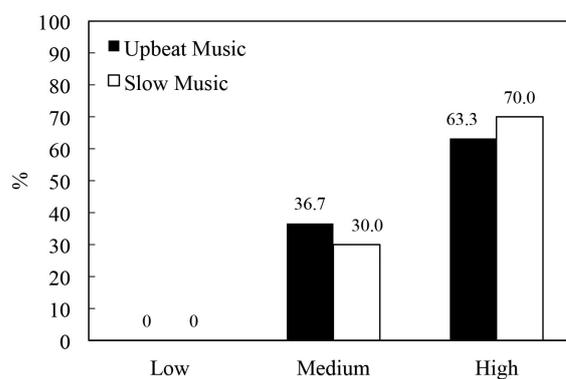FIGURE 2 Experience during mammogram

FIGURE 3 Anxiety level

Fig. 1 shows the respondents' allocation in both groups according to the types of music, namely upbeat and slow music. The number of respondents in both slow and upbeat music groups was the same. Music is said to provide calmness and ease during medical screening. Fig. 2 shows that the majority of respondents in the upbeat group (30.0%, 40.0% and 33.3%) felt calmer, comfortable and relaxed during the mammography screening, respectively.

Fig. 3 shows the anxiety level between both groups. The result revealed that most respondents in the slow music group (70.0%) had a high anxiety level as compared to upbeat music group (63.3%). However, there was no significant effect for music, $t(60) = -0.54$, $p = 0.59$, despite slow song ($M = 1.70$, SD = 0.47) attaining higher anxiety level than upbeat song ($M = 1.63$, *SD* = 0.49).

DISCUSSION

Music played positive and negative roles in homeostasis in both personal and social areas (Habibi & Damasio 2014). Music through its complex spectral and temporal patterns and activities, helps wire the brain and bind the senses, and thus affecting perceptual experience (Kraus & Chandrasekaran 2010). Koelsch (2014) revealed that music can modulate activity in the brain structure that is known to be crucial part involved in emotion, such as amygdala, nucleus accumbens, hypothalamus, hippocampus, insula, cingulate cortex, and orbitofrontal cortex.

The power of music to change the neuronal activity within the brain structures allows the use of music as therapies (Koelsch 2014). Music therapy has

healing power and has been practised for long time in the clinical setting, as it does not involve invasive procedure and can give positive vibes and effect when the situation is directed to reducing pain, anxiety, stress and depression (Supnet 2016). Thus, even though anxiety has been determined to be a common problem during all kinds of medical diagnosis, treatment and care (Bolukbas et al. 2010), including mammogram screening (Domar et al., 2005), however with music as relaxation method, it has potential in reducing anxiety level during mammography examination (Zain et al., 2020).

The finding of this study showed that the anxiety level for women who underwent mammography screening for upbeat music group was low (63.3%) as compared to slow music group (70.0%). On the other hand, a previous study showed that soothing music was effective in decreasing pain as well as reducing sensation and distress from the procedure (Labrague et al. 2013). Furthermore, Ugras et al. (2018) described that the level of anxiety on classical music significantly decreased the scores of the anxiety.

Another finding in this study showed a difference in one of the questions, as the majority of patients felt more calm, comfortable, and relax during the mammography screening with upbeat music than to slow music. Fast tempos such as upbeat music managed to stimulate optimistic and content mood as well as increased the arousal levels as compared to slow tempo (slow music) that stimulated a more unenthusiastic and sad mood as well as decreased the arousal levels (Bottiroli et al. 2014).

Another study revealed that upbeat music showed much more happiness to the participants than slow music tempo during the experiment (Hunter, Schellenberg & Griffith 2011). Khan & Ajmal (2017) revealed that pop music enhances mood and level of happiness as compared to classical and no music. Therefore, upbeat music was found to be effective in reducing anxiety level during mammography screening.

Even though patient in upbeat music group has lower anxiety level compare to slow music group, there is no significant difference on anxiety level between both group during mammography screening. This observation revealed that any kind of music can be used as a relaxation method during the mammograms. This is because according to Groarke & Hogan (2019), personally chosen music gave a positive effect to the listeners. Based on a systematic review study, the findings showed that the use of music can reduce pain and anxiety among women during mammography screening (Ruslizam et al. 2020). This is also supported by the previous study where the patients who listened to music showed a greater reduction in anxiety after the breast biopsy (Bennett et al. 2020).

In this study the limitation is related to the factors that may influenced the lower anxiety level among upbeat music group. Anxiety level may be affected by various factors such as pain from previous mammograms (Yilmaz & Kiymaz 2010; Abdel-Aziz et al. 2017). Another factors may influence the uptake of mammograms are fear of having breast cancer, previous breast procedures and lack of knowledge on how mammogram screening is done (Zain et al. 2020). Thus, it can be a useful additional information.

CONCLUSION

Music can help decrease the anxiety level of women undergoing mammogram screening. As upbeat music is happier and can lift up person's mood, this type of music was preferred by the respondents of this study. Therefore, this method can be implemented in hospitals to encourage women to undergo mammography examination effectively.

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