

# Mammogram: Does Music Therapy Helps?

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**Abstract**— Anxiety was the barrier mostly chosen by women for not performing mammography examination. Music was perceived as an effective method in reducing these barriers. Thus, this study was done to investigate how music would influence anxiety level among women undergoing mammogram screening. A cross-sectional descriptive study was conducted at randomly selected private hospitals around Klang Valley. The 'State-Trait Anxiety Inventory' form was used to measure the level of anxiety. Respondents were categorized into two groups, which are control (no music) and experimental (with music) groups. Descriptive analysis was used to determine the anxiety level and T-test analysis were used to compare the anxiety level between both groups. A total of 60 respondents participated in this study in which 30 (50.0%) were in a control group and 30 (50.0%) were in the experimental group. Mean age of respondents were 53.5 ( $\pm 12.7$ ) years. The anxiety level is high in women who underwent mammography with no music (60.0%) as compared those with music (53.3%), although the difference is not significant ( $p > 0.05$ ). Music intervention has potential in reducing anxiety level during mammography examination.

**Index Terms**—mammogram; music; anxiety.

## I. INTRODUCTION

Mammography is a technique that allows early detection for breast cancer in reducing mortality [1], and it also has been known as the gold standard in detecting breast cancer [2]. Malaysian Government has provided minimal fee for mammogram screening [3], nonetheless the prevalence mammogram screening in Malaysia was only 7.6% in 2006 compared to developed countries such as United Kingdom, Sweden and France with prevalence between 80- 95% [4].

This showed that even though mammography has capability to improve women's health and reduce risk of breast cancer, majority of women are not willing to undergo this screening. Several barriers on mammography screening have been identified that influenced in mammography uptake. Most of the common barriers are pain and anxiety [5]-[7].

Pain is defined as uncomfortable feeling that is channelled to the brain by sensory neurons [8]. Patient might feel painful during mammography screening because it involve compression to the breast tissue [9]. Some women might have

faced bad experience from previous mammography screening [10]. Women felt severe pain when they have thicker breast [9]. About 67% women expected a painful mammography [11]. Thus, if women continuously face pain during the screening, the possibility for them to re-attend the next mammography appointments is low [11]-[12].

Anxiety is a psychological reaction to a threat or danger [13]. There are several factors that cause anxiety in mammography such as previous mammography experience, fear of having breast cancer, previous breast procedures and lack of knowledge on how mammogram screening is done. Women feel anxiety about mammography due to pain experienced during the procedure [9]. Such factors may contribute to anticipatory anxiety and this may lead to pain emphasis [14]. Thus, patient with low anxiety will be more pain tolerant compared with patient with higher level of anxiety [15].

Music gives healing potential in natural way in term of physical, emotion and social concern for people in all ages [16]. Music can also provide distraction to patient which can help patient to become less stress and anxious during medical procedure [13], [15]. However, there is a limited study on music as relaxation technique for reducing anxiety during mammography [17]-[18], and no such study has been done in Malaysia. Therefore, this study is conducted to investigate how the music would influence anxiety level among women undergoing mammogram screening with and without music therapy.

## II. MATERIALS AND METHOD

### A. Study Design and Population

A cross-sectional descriptive study was conducted at randomly selected private hospitals around Klang Valley. The respondents were selected from the patient aged 40 years old and above who came to radiology department for mammography using a purposive sampling. Patients were allocated into two groups; experimental group who received the music and control group who did not received any music. For the experimental group, the patients were provided with the music from beginning until the end of procedure. This

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sample randomization is based on schedule that was prepared by person in-charge.

**B. Data Collection**

The mammography suite was equipped with an adjustable speaker (Yamaha EMX5016CF-input Powered Mixer with dual 500W, a laptop installed with slow-type of music and a connection cable. Music was played at 60 dB during the mammography screening. Each respondent was given a set of validated questionnaire ( $\alpha = 0.77$ ) in English language that needed to be answered after the mammography screening. This questionnaire was designed to obtain information on socio-demographic data, and measure anxiety level using The 'State-Trait Anxiety Inventory' Form. There are 4 degree of anxiety which '1' represents as 'not at all', '2' as 'somewhat', '3' as 'moderately so' and '4' as 'very much so'. Twenty questions were summed up to measure the marks for the patient's anxiety level.

**C. Ethical Consideration**

Permission was obtained from the Institutional Review Board with registration number (KPJUC/RMC/SOHS/EC/2019/225). Respondent consented to participate prior to any intervention or data collection.

**D. Statistical Analysis**

The categorical response (Yes/No) was applied for each items. '0' was assigned to Yes while '1' was assigned to No answers. With the reference to Spielberger (1986), the total score of anxiety is categorized as low (20 to 23 marks), moderate (24 to 46 marks) and high (47 to 80 marks). Descriptive analysis was used to determine the anxiety level among women undergoing mammogram with and without music therapy. T-test analysis were used to compare the significance of anxiety level between both groups. All data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20 and Microsoft Excel.

**III. RESULTS**

Table I shows the socio-demographic data of the participants. A total of 60 respondents participated in which 30 (50.0%) were in a control (no music) group and 30 (50.0%) were in the experimental (with music) group.

TABLE I: SOCIO-DEMOGRAPHIC DATA (N=60)

Socio-demographic	Frequency (n)	Percentage (%)
Group		
Experimental (With music)	30	50.0
Control (No music)	30	50.0
Race		
Malay	25	41.7
Chinese	31	51.7
Indian	4	6.7
Others	0	0
Marital status		
Single	9	15.0
Married	41	68.3
Divorce	2	3.3
Widowed	8	13.3
Have you ever done mammogram before?		
Yes	4	6.7
First time	20	33.3
Second time	23	38.3
>2 times	12	20.0
No	1	1.7

The mean age of respondents was 53.50 ( $\pm 12.7$ ) years. Majority of the respondents were Chinese (51.7%) followed by Malay (41.7%) and Indian (6.7%). Majority of the respondents were married (68.3%). A total of 20 (33.3%) women were undergoing mammogram for the first time.

Fig. 1 shows the percentage of experimental (with music) and control (no music) group in calm aspect. Both groups showed different level of calm. The result shows that many respondents in control (no music) group (13.3%) do not feel calmer during mammography screening than the experimental (with music) group.

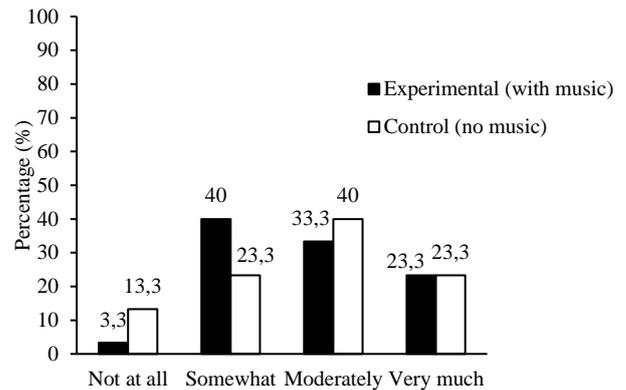


Fig. 1. Calm during mammography screening.

Fig. 2 shows the relaxing feels by the both groups. The result shows that many respondents in control (no music) group (10.0%) do not feel relaxed during mammography screening than the experimental (with music) group.

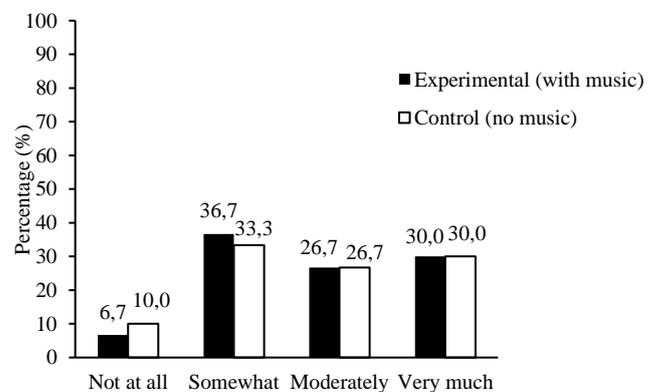


Fig. 2. Relax during mammography screening.

Fig. 3 shows the anxiety level between both experimental and control group. The results revealed that most participant in control (no music) group (60.0%) has high anxiety level compare to experimental (with music) group (53.3%). However, there were no significant difference on anxiety level between both groups during mammography screening ( $p > 0.05$ ).

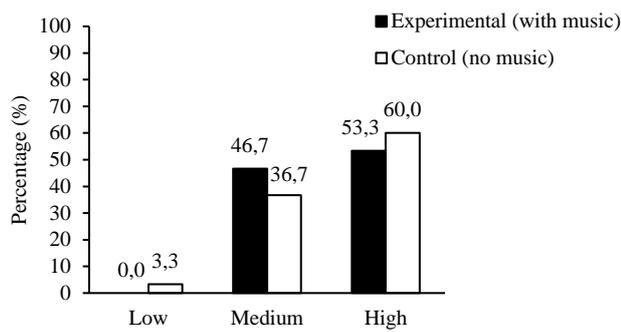


Fig. 3. Anxiety level during mammography screening.

#### IV. DISCUSSION

Delay in diagnosis and treatment of breast cancer affects directly the patient's survival and increased morbidity and mortality [19]-[20]. The low survival rates in developing countries are explained by scarcity of early detection programs, resulting in a high proportion of women presenting with late-stage disease at diagnosis, along with the lack of adequate diagnosis and treatment facilities [21] as well as delays associated with treatment [22]. Pain and anxiety are often a hindrance to the rate of intake of mammography screening among women [23]. Despite numerous methods being implemented to improve breast health in Malaysia, the situation is still worrying as the breast cancer cases in Malaysia is still higher than its neighbouring countries [3].

In this study, women in aged of 40 years old and above are selected as participants. This is because women aged 40 to 44 should have the choice to start annual breast cancer screening with mammograms, women aged 45 to 54 should get mammograms every year and women aged 55 and older should switch to mammograms every 2 years, or can continue yearly screening [24]. However, in this study, the number of participants that undergo mammography screening for more than once was only 29.7%. This observation shows that the number of repeat mammography screening was low. This might be due to the perception and expectations of pain from the mammogram [11].

Music therapy is recognized to be a useful tool in order to reduce the anxiety [25]. In this study, when music is applied during mammography screening, most of the participants feel calmer and comfortable than when no music was applied. This shows that this relaxation method can distract patient's mind. Based on a systematic review study, the findings showed that the use of music can reduce pain and anxiety among women during mammography screening [23]. This is also supported by the previous study where the effectiveness of hearing music while undergoing medical examination is also proved especially in MRI examination, where music is able to distracts attention from examination and relaxes the patients [26].

A study among participants in age from 15 to 93 years old from outpatient radiology practice, showed that participants receiving the live music therapy had fewer scans repeated due to movement and shorten the length of time required for individuals to complete the scan. It also reported the participants revealed they had better perception of the procedure [27].

Plus, in another study showed that patient in intervention group with music therapy under general anaesthesia feels satisfaction during abdominal surgery rather than patients in group without music [28]. Thus, music helps to improve mood and distract from physical illness [29]. It is because music can activate the endorphins, which decreases the unpleasant feelings and emotions and also decreases the sympathetic nervous system activity [30].

However, there were patients that still feel worry and afraid during mammogram screening. This might not be because of a mammogram but because of fear about having breast cancer while waiting for the mammogram's result. Women feel anxiety due to fear of cancer and pain during mammogram and this fear prohibited the women from having mammogram [9]. Another study reported that 20% and 5.5% of the participants were fearful of the mammogram's result and fearful of having mammogram, respectively [2], [31].

Even though patient in control group has high anxiety level compare to experimental group, there is no significant difference on anxiety level between both experimental and control group during mammography screening. This observation revealed that the music is not effective for all women during the mammography examination. Furthermore, the insignificant of the difference between both groups might be due to fear of mammography procedure followed with the fear of results, which are common among the women prior to mammography examination.

This is supported by the previous study, where it concluded that state of anxiety regarding mammography is linked to attending, thinking on actual procedure, nervous anticipation about outcome of mammography examination, uncertain result and fear of the result, but it is not perceived as a great problem by some of the women in the study [32]-[34]. However, these factors can be prevented by delivered accurate information and emotional support [32], [35].

#### V. CONCLUSION

In conclusion, music as relaxation method has potential in reducing anxiety level during mammography examination, despite it did not greatly affected for all patients. Therefore, by applying this method with effective communication and explanation to patient, patients can be influenced to change their perceptions on mammography examination. This serve as a paradigm shift for further improvement in breast cancer screening program in Malaysia.

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