

## Effectiveness of the "Emotion Recognition" Music Therapy Module in Schizophrenia Patients: A Quasi Experimental Study

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### Abstract

One of the deficit domains of social cognition in schizophrenia patients is emotion recognition. Negative emotion recognition deficits, such as emotional deficits of fear, anger, and sadness already exist in the first episode of schizophrenia. Music as therapy is known to be beneficial for emotional improvement, as well as the emotional experience of patients with schizophrenia. This study was aimed to assess the validity and effectiveness of a music therapy module "emotion recognition" in improving recognition of basic emotions in patients with schizophrenia.

This quasi experimental study was conducted at the adult outpatient clinic at Cipto Mangunkusumo Hospital. The research was conducted in 2 steps. The first step to assess the validity of the module by calculate the I-CVI, S-CVI, and CVR of validity test and the second step to implement the music therapy module to the patient. This study assessed 15 subjects of schizophrenic remission patients who attended music therapy for 10 sessions conducted from March 2020 to July 2020. Subjects were assessed pre and post music therapy test results to see the effectivity of the module as seen by improvements in recognition of 5 basic emotions (happy, sad, anger, fear, tender) using the Mcnemar statistical test.

The results of the validity test of the module showed the I-CVI of 0.98, S-CVI of 0.95, and CVR of 0.97. There was a significant improvement in the emotional deficits of fear and anger, with an increase in the pre and post music therapy test scores with a p-value 0.016 in the anger emotion and 0.008 in fear emotion, but not significant in the happy, sad, and tender emotions (p-value > 0.05).

The emotion recognition music therapy module has good content validity, and effectiveness in emotion recognition of some of the basic emotions of remission schizophrenia patients, especially the emotion recognition of fear and anger.

Clinical article (J Int Dent Med Res 2021; 14(4): 1722-1726)

**Keywords:** Schizophrenia; music therapy; emotion recognition, effectivity

**Received date:** 15 February 2021

**Accept date:** 06 August 2021

### Introduction

Schizophrenia is a mental disorder that is often found with a prevalence of 1% of the adult population worldwide. Along with the course of the disease, which often becomes chronic, patients usually experience a decrease in quality of life, impaired independence, as well as socio-occupational dysfunction.<sup>1</sup> There has been a decrease in several social cognition domains consisting of emotional processing, social perception, social knowledge, theory of mind and

attribution bias.<sup>2,3</sup> Emotion recognition is part of emotional processing in affective nonverbal communication, which is a key component of interpersonal adaptation that plays an important role in emotional deficits in patients with schizophrenia.<sup>4,5</sup> Emotional recognition is a conscious expression of an individual's emotional state to form the flexibility of emotional responses to help achieve good adaptation. Emotion recognition deficits are linked not only to social outcomes but also to patient performance globally, and contribute to exacerbation of symptoms. In particular, emotion recognition deficits were present in the first episode of schizophrenia. In terms of emotion recognition, schizophrenic patients have been shown to show deficits in recognizing facial expressions, gestures, and speech rhythms.<sup>3,4</sup>

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Emotion recognition requires emotional experience and emotional regulation starting from external stimuli from various senses, both visual, auditory, and others. which will be stored in memory. The function of a person's interpersonal adaptation in emotional recognition is related to musical stimuli in the form of auditory music with emotional content like happy, sad, anger, afraid, and tender that will become someone's emotional experience related to certain situations and regulated into a learning process to recognize various kinds of emotions.<sup>7,8</sup>

The various mechanisms underlying the induction of emotions through music are: (1) brain stem reflexes (brain stem reflexes), (2) evaluative conditioning, (3) emotional contagion (emotional contagion), (4) Visual imagery (visual imagery), (5) episodic memory, and (6) musical expectancy (musical expectancy). The emotional power of music is systematically used to improve a person's health and well-being.<sup>6,7</sup>

Music as a therapy is beneficial for emotional improvement<sup>9,10,11</sup> also related to emotional recognition of patients with schizophrenia. Researchers were inspired by research conducted by Erkilla et al in 2011<sup>12</sup> and also Bodner et al in 2006<sup>13</sup> regarding music therapy for emotional improvement in mental disorder patients. Geretsegger found that music therapy can improve the negative symptoms of schizophrenia.<sup>14</sup> This study assessed the music therapy module that has content validity, and effectiveness to be used to help improving emotional recognition deficits in patients with schizophrenia.

## Materials and methods

This study used a quasi-experimental study design to assess the effectiveness of the emotion recognition music therapy module which has content validity in people with schizophrenia. The research was conducted at the adult outpatient clinic at Cipto Mangunkusumo Hospital from March 2020 to July 2020. The study consisted of 2 steps. The first step to assess the validity of the module and the songs by calculate the I-CVI, S-CVI, and CVR of validity test and the second step to implement the music therapy module to the patient. The sample of the study were all male and female schizophrenic patients in remission aged 18 - 59 years who came to the

adult outpatient clinic at Cipto Mangunkusumo Hospital and met the study inclusion criteria.

Sampling was determined by simple random sampling from the data bank of schizophrenia patients at the Adult outpatient clinic at Cipto Mangunkusumo Hospital. The Inclusion Criteria subjects are in remission, meet the criteria for all types of schizophrenia based on the structured clinical interview for the DSM-IV axis I disorders (SCID-I), understand Indonesian language well, between 18 and 59 years old on the day of the study examination, are willing to take part in the study and fill out an informed consent. Subjects were excluded if they had comorbid serious general medical conditions that could hinder mobilization, such as stroke, kidney failure, heart failure and also had five sensory disabilities, and if they had special skills in the field of vocals or music as evidenced by a diploma or official certificate. The informed consent was obtained from each subject. This study has passed the permission and ethical review from the Ethics Committee of the Faculty of Medicine University of Indonesia (KET-877/UN2.F1/ETIK/PPM.00.02/2019)

The music therapy module "Emotion Recognition" was created by a music therapist improvisation in collaboration with a researcher by paying attention to scientific principles and according to music therapy theory. Before being applied to the subject, this module was subjected to content validation by 5 musicians and 3 psychiatrists. Each expert gives an assessment of each song, 5 songs for the pre and post-module test and 15 practice songs in the music therapy module by providing an assessment of the suitability of the statements from a scale of 1-3: 1 (not relevant), 2 (quite relevant), 3 (relevant). Content validity analysis used the Item-level Content Validity Index (I-CVI), Scale-level Content Validity Index (S-CVI) and Content Validity Ratio (CVR). This module consists of 10 sessions starting with a pre-therapy test conducted in session 1, in which the subjects listen to several songs that have been validated (pre test songs and post test songs are the same songs in accordance with each basic emotion songs) and provides answers to answer sheets related to the right emotions that represent the music being played. In each session the subject gets emotion recognition learning by music therapists through songs, group discussions, and playing with musical instruments. In each session

there are 2 types of emotions that are trained. The duration of each session is 50 minutes. At the end of the tenth session, a post-therapy test was conducted again in the form of replenishing the answer sheet from the music that was played which represented each emotion. The results of the pre and post therapy tests will be assessed through the McNemar statistical test to see the effectiveness of the "emotion recognition" music therapy module.

Average age (years) ± SD	34,00 ± 10,11	
	Amount (n)	Percentage (%)
<b>Gender</b>		
Woman	4	26,4
Man	11	73,3
<b>Marital status</b>		
Not married	13	86,6
Married	2	13,4
Divorce	0	0
<b>Level of education</b>		
Junior High School	1	6,6
High School	10	66,6
Vocational High School	0	6,6
Diploma	1	6,6
Bachelor	3	20
<b>Occupation</b>		
Government employee	0	0
Private employee	0	0
Entrepreneur	5	33,3
Housewife	2	13,3
College student	1	6,66
Unemployment	7	46,6
<b>Musical ability</b>		
Formal study	0	0
Informal study	2	13,3
Play musical instrument	4	26,6
Recognize tone of music	6	40

**Table 1.** Demographic Characteristics of Research Subjects.

**Statistic analysis**

Data were collected and processed statistically. This data processing uses the Statistical Analysis Software Package for Windows (SPSS®, IBM, USA) version 22. Sociodemographic characteristics (age, gender, marital status, occupation, and education) were analyzed univariately and presented in terms of numbers and percentages. Measurement of the ratio of I-CVI, S-CVI, and CVR of each song in the music therapy module was carried out for content validity. Analysis of differences in pre and post therapy surveys of subjects who received "emotion recognition" music therapy on happy, sad, anger, fear, and tender emotions using the McNemar test to see the difference between the two population in pairs for the effectiveness of

the music therapy module. The significance of the two variables was statistically significant if the p value was <0.05. The data will then be presented in descriptive and table form.

**Results**

This research is a Quasi-Experimental study conducted at the Adult Psychiatric clinic of Cipto Mangunkusumo Hospital. Fifteen (15) subjects participated in this study according to predetermined inclusion criteria and can be found in table 1, 2, 3.

Song	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Number in agreement	I-CVI	CVR
Pre and post test 1	3	3	3	2	3	5	1	1
Pre and post test 2	2	2	3	2	3	5	1	1
Pre and post test 3	3	3	3	2	3	5	1	1
Pre and post test 4	2	3	3	2	3	5	1	1
Pre and post test 5	2	3	2	2	3	5	1	1
Anger 01	2	3	3	2	3	5	1	1
Anger 02	2	2	2	2	3	5	1	1
Anger 03	2	3	3	3	2	5	1	1
Sad 04	3	3	3	2	2	5	1	1
Sad 05	3	3	3	2	3	5	1	1
Sad 06	3	2	3	2	3	5	1	1
Happy 07	3	2	3	2	3	5	1	1
Happy 08	3	2	3	2	2	5	1	1
Happy 09	3	2	3	2	2	5	1	1
Fear 10	2	3	2	2	2	5	1	1
Fear 11	2	3	2	2	3	5	1	1
Fear 12	2	3	2	1	3	4	0.8	0.6
Tender 13	3	2	3	2	3	5	1	1
Tender 14	2	3	3	2	3	5	1	1
Tender 15	3	2	3	2	3	5	1	1
I-CVI	0.98							
S-CVI	0.95							
CVR	0.97							

**Table 2.** Assessment of Agreement on the Validity of the Song Content Module Emotion Recognition Music Therapy.

\*I-CVI: item-level content validity index, S-CVI: scale-level content validity index, CVR: Content validity ratio.

Type of emotion	Number of correct answer (n =13)		p-value
	Pre test	Post	
Anger	2	9	0.016
Sad	7	7	>0.05
Happy	10	12	>0.05
Fear	3	10	0.008
Tender	8	8	>0.05

**Table 3.** The results of pre and post music therapy tests.

**Discussion**

This music therapy module is expected to become a non-pharmacological therapeutic modality to help patients get to know basic emotions again. Music therapy in this module combines active and receptive methods in accordance with the principles of Music Therapy".<sup>16</sup> The music induction mechanism that may underlie the effectiveness of the emotion recognition music therapy module is in accordance with the theory which is related to visual imagery and also evaluative conditioning according to Weisgerber et al in 2013.<sup>7</sup> From the observations of the 10 sessions conducted, it can be seen that the pieces of music heard by the subject feel the emotional expression of the music, and then imitate these expressions internally, which leads to the induction of the same emotions and the same thing related to musical stimuli that the therapist repeatedly listens to. which is paired with certain moments that are narrated or carried out by discussion between the therapist and the subject which becomes a lesson to the subject in the induction of music into oneself.

Limitations of present study associated with there is no follow-up evaluation after this therapy ends to find out how long the effects of this music therapy last and this study used quasi experimental study not Randomized Controlled Trial study which has more power to assess the effectivity for an intervention study.

The results of this study answered the hypothesis of the study that the Emotion Recognition music therapy module had good content validity. The Emotion Recognition music therapy module also has effectiveness in being one of the therapeutic modalities to improve emotional recognition, especially from improving the emotional recognition deficits of anger and fear as shown in the Mcnemar test results, namely  $p < 0.05$ . This is in accordance with previous studies from Weisgerber et al<sup>17</sup> and also Bediou et al<sup>18</sup> which stated that schizophrenia patients had a deficit in recognizing negative emotions such as fear, anger, and sadness both in recognition through faces and also musically.

## Conclusions

This results suggest that Emotional recognition music therapy module for

schizophrenia patients has good content validity and has the effectiveness of correcting the emotion recognition deficits of anger and fear in schizophrenia patients and in accordance with the theory that negative emotional deficits such as anger and fear exist in schizophrenia patients.

## Acknowledgments

"The authors would like to thank Universitas Indonesia for funding this research through PUTI Q4 Grant scheme with contract number (NKB-359/UN2.RST/HKP.05.00/2020).

## Declaration of Interest

The authors report no conflict of interest.

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