

# Profile of Regulation Emotions of Vocational School Students After Religious Instrumental Music Intervention from the Perspective of Science Education

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## Abstract

**Objective:** This study aims to analyze the percentage of regulated emotions among vocational high school (SMK) students after the application of a combination of religious instrumental music from a science education perspective. **Method:** The study used a quantitative descriptive approach with a survey of 90 SMK students in Blitar Regency, selected using purposive sampling. Data were collected using a Likert-scale questionnaire developed within Gross's emotion regulation theory framework, then analyzed descriptively using percentages. **Results:** The intervention elicited predominantly positive affective emotions, particularly happiness (90.0%) and inner peace (71.1%), as well as reflective emotions such as spiritual emotion and nostalgia, whereas negative emotions such as anxiety and anger were low (17.8%). In addition, the majority of respondents reported increases in emotional awareness, cognitive reappraisal abilities, control over negative emotions, and emotion-based motivation. **Novelty:** The novelty of this study lies in the quantitative mapping of the distribution of emotion types after the musical instrument intervention, which provides a detailed empirical picture of the dynamics of students' emotion regulation in the context of science education.

## Abstrak

**Tujuan:** Penelitian ini bertujuan menganalisis persentase regulasi pada siswa Sekolah Menengah Kejuruan (SMK) setelah penerapan kombinasi musik instrumental religi dalam perspektif pendidikan sains. **Metode:** Penelitian menggunakan pendekatan deskriptif kuantitatif dengan metode survei terhadap 90 siswa SMK di Kabupaten Blitar yang dipilih melalui purposive sampling. Data dikumpulkan menggunakan kuesioner berbasis skala Likert yang disusun berdasarkan kerangka teori regulasi emosi Gross, kemudian dianalisis secara deskriptif menggunakan persentase. **Hasil:** Hasil penelitian menunjukkan bahwa intervensi memunculkan dominasi emosi afektif positif, terutama kebahagiaan (90,0%) dan ketenangan batin (71,1%), serta emosi reflektif seperti rasa haru dan nostalgia spiritual, sementara emosi negatif seperti cemas atau marah muncul dalam persentase rendah (17,8%). Selain itu, mayoritas responden menunjukkan peningkatan kesadaran emosi, kemampuan reappraisal kognitif, pengendalian emosi negatif, serta motivasi berbasis emosi. **Kebaruan:** Kebaruan penelitian ini terletak pada pemetaan kuantitatif distribusi jenis emosi pasca intervensi instrument musik, yang memberikan gambaran empiris rinci mengenai dinamika regulasi emosi siswa dalam konteks pendidikan sains.

## Introduction

Music is a significant auditory stimulus that influences human emotional states through complex interactions between sound waves and the central nervous system. Music can modulate brain activity in areas associated with mood regulation and anxiety, including the amygdala and prefrontal cortex, which play a role in emotional processing and affective control. Recent global research shows that music therapy reduces anxiety and stress [1], [2]. In the context of education, students' emotional responses to external stimuli such as music have implications for learning processes and psychological well-being. Music not only serves as entertainment but also as an adaptive tool studied by psychology and neuroscience to assess affective changes in academic settings. Research in Indonesia shows that music education, as a microtherapy, helps reduce students' academic anxiety, reinforcing the relevance of the music approach in the school context [3]. Auditory stimuli and expressive writing are prominent emotion regulation strategies in the psychological literature, and effective interventions for reducing anxiety and improving emotion regulation. Experimental research on adolescents shows that expressive writing can improve emotional regulation abilities after intervention, especially in the context of remission of emotional symptoms in student groups [4], [5]. These research results support the idea that structured writing activities can help individuals better understand and manage their emotional experiences.

The combination of religious instrumental music and expressive writing as a multimodal intervention integrates two pathways of emotional regulation: the sensory pathway (music) that affects the limbic and autonomic nervous systems, and the cognitive-reflective pathway (writing) that involves the processing and restructuring of emotions in the prefrontal cortex. This approach allows for a variety of adaptive emotional responses, such as happiness, inner peace, emotion, and spiritual nostalgia, as well as negative emotions, such as anxiety or anger. However, previous studies have mainly focused on changes in general anxiety levels or stress reduction, without detailing the dynamics of the percentage of emotions that arise after the intervention. In fact, quantitative mapping of emotion types, such as the percentages of affective and negative emotions that emerge, is a scientific approach that can reveal a more detailed, empirical emotional profile, in line with research standards in science education that emphasize statistically measurable variables. For vocational high school (SMK) students, mapping the distribution of emotions is essential because SMK teenagers often face complex academic, social, and psychological pressures. Studies on the distribution of emotions provide deeper insights into how science-based interventions, such as a combination of religious instrumental music and expressive writing, contribute to the empirical regulation of students' emotions. Based on the above description, this study aims to analyze the percentage of regulated emotions in vocational high school students after the application of religious instrumental music from the perspective of

science education. This study is expected to strengthen the empirical basis for science-based interventions that support students' emotional health in a measurable, scientific manner within the context of formal education.

## **Method**

This study uses a quantitative descriptive approach with a survey method through the distribution of questionnaires. This approach was chosen to obtain an empirical description of how music contributes to improving emotional regulation in vocational high school students.

### **Population and Sample**

The research population consisted of vocational high school students in the Blitar Regency who listened to music. The sample consisted of 90 respondents selected using purposive sampling, based on specific criteria relevant to the research topic. This technique was chosen due to time and resource constraints that made it impossible to collect data from the entire population. To maintain research ethics, the identities of the respondents, including the names of the students and their schools, were not disclosed and were kept confidential.

### **Instruments and Data Collection Techniques**

Primary data was obtained through a questionnaire distributed using Google Forms. The research instrument contained two main parts, namely: (1) demographic information of respondents, and (2) measurement items regarding music listening habits and emotion regulation, which were compiled based on Gross's theoretical construct [6] [7], including: attention deployment, cognitive reappraisal, response modulation, and other emotion regulation strategies. The questionnaire used a Likert scale to facilitate analysis and measurement of variable tendencies.

### **Data Processing and Analysis Techniques**

The collected data were processed using descriptive statistics and tabulations with percentages to examine the tendencies of the research variables. The analysis results were then interpreted to explain how music supports the emotional regulation of vocational high school students [8].

## **Results**

### **Respondent Characteristics Based on Gender**

This study involved 90 respondents, all of whom were active students and listened to religious music regularly. Based on gender distribution, the majority of respondents were female, numbering 73 (81.1%), while male respondents numbered 17 (18.9%). This composition shows that the use of religious music in daily activities and emotional management is more prevalent

among female respondents.

**Table 1.** Distribution of Respondents Based on Gender

Gender	Number of Respondents	Percentage (%)
Male	17	18,9
Female	73	81,1
Total	90	100

#### Intensity of Listening to Religious Music

The results of the analysis show that the intensity of listening to religious music among respondents is relatively high. A total of 39 respondents (43.3%) stated that they listen to spiritual music very often, followed by 41 respondents (45.6%) who listen to it often. Meanwhile, only 10 respondents (11.1%) listened to religious music occasionally. These findings indicate that religious music has become an integral part of students' routines, whether for studying, worship, relaxation, or managing emotional stress.

**Table 2.** Intensity of Listening to Religious Music

Intensity Category	Number of Respondents	Percentage (%)
Very Often	39	43,3
Often	41	45,6
Occasionally	10	11,1
Total	90	100

#### Emotions Felt When Listening to Religious Music

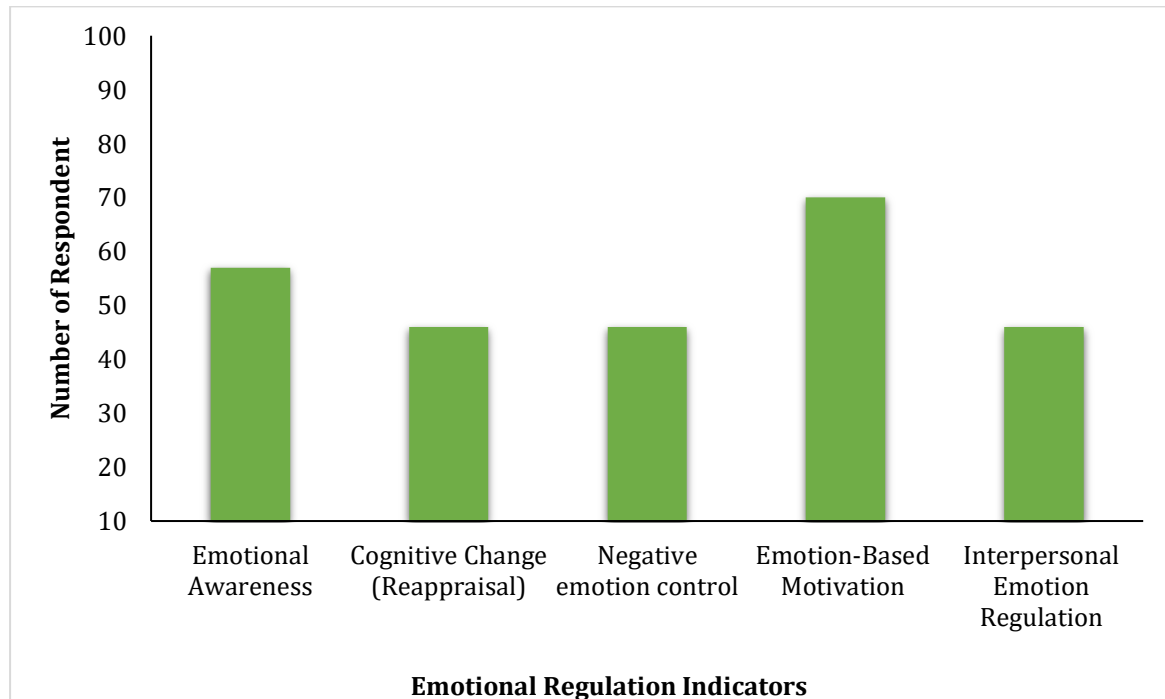
Religious music stimulates various emotional responses in respondents. Most respondents reported experiencing positive affective emotions. A total of 81 respondents (90%) reported feeling happiness, and 64 respondents (71.1%) reported feeling calmness or inner peace. In addition, 64 respondents (71.1%) reported feeling reflective emotions such as sadness, and 51 respondents (56.7%) reported experiencing nostalgia or spiritual memories. On the other hand, negative emotions such as anxiety or anger were only felt by 16 respondents (17.8%). These results indicate that religious music is more effective at evoking positive, reflective affective emotions than negative emotions.

**Table 3.** Types of Emotions that Arise when Listening to Religious Music

Type of Emotion	Number of Respondents	Percentage (%)
Happiness	81	90.0
Calmness / Inner Peace	64	71.1
Emotional Arousal / Sadness	64	71.1
Nostalgia / Spiritual Memories	51	56.7
Anxiety or Anger	16	17.8

## Indicators of Emotion Regulation in the Context of Religious Music

The analysis of emotion regulation refers to the indicators of five leading theoretical frameworks: emotional awareness, cognitive change (reappraisal), control of negative emotions, emotion-based motivation, and interpersonal emotion regulation [6;7;12].



**Figure 1.** Percentage distribution of emotional regulation indicators among vocational high school students after religious instrumental music intervention.

**Emotional Awareness:** Among 57 respondents (63.3%), 57 stated that religious music helped them recognize and become aware of their emotions. Spiritual lyrics and soft melodies increased respondents' sensitivity to their internal emotional state. Forty-six respondents (51.1%) felt that Cognitive Change (Reappraisal) in religious music helped them reassess emotional situations more positively. Religious values such as patience, trust in God, and sincerity contributed to reducing negative perceptions of stressful situations, followed by negative emotion control (Response Modulation), which acknowledged that religious music helped alleviate negative emotions such as sadness, anger, and anxiety. Religious music serves as a calming stimulus that helps reduce emotional tension, and the Interpersonal Emotion Regulation indicator reports that it increases empathy and understanding of others' feelings, primarily through lyrics that address themes of struggle, patience, and sincerity. Emotion-Based Motivation was demonstrated in 70 respondents (77.8%) who stated that religious music increases motivation in daily activities. Respondents felt more focused, optimistic, and enthusiastic in completing academic tasks and personal activities.

## Discussion

The results of the study show that the combination of religious instrumental music and expressive writing elicited predominantly positive affective emotions among respondents, particularly happiness (90%) and inner peace (71.1%). In contrast, negative emotions such as anxiety and anger appeared at relatively low percentages (17.8%). These findings indicate that religious music serves as an effective auditory stimulus in modulating students' emotional responses, in line with the neuroscience view that music can influence the activity of the limbic system and the prefrontal cortex, which are involved in emotion processing and regulation [9].

Physiologically, slow, harmonious instrumental music is known to decrease sympathetic nervous system activation and increase parasympathetic activity, which is associated with feelings of relaxation and calm. Recent experimental studies show that exposure to instrumental music significantly reduces anxiety and stress levels through neurophysiological regulatory mechanisms, including decreased cortisol and stabilized autonomic responses [10] [11]. This is consistent with the high percentage of respondents who reported inner calm and coolness in this study. In addition to positive affective emotions, the findings show a high occurrence of reflective emotions such as sadness or mourning (71.1%) and nostalgia or spiritual memories (56.7%). These emotions are not always maladaptive, but can serve as a form of deep emotional processing. Recent research in music psychology shows that mixed emotions, such as sadness, in the context of music are often associated with personal meaning and self-reflection, which contribute to psychological well-being [12]. Thus, the emergence of these emotions can be understood as part of the adaptive emotional regulation process, rather than merely as an indicator of distress.

The finding that only a small proportion of respondents experienced negative emotions such as anxiety or anger (17.8%) reinforces the argument that religious music has a protective effect against the emergence of negative emotions. This is consistent with the results of a recent meta-analysis showing that music-based interventions are significantly more effective in reducing anxiety than control conditions, especially when the music has personal or spiritual meaning for the listener [11]. In terms of emotion regulation, the study's results indicate that religious music contributes to several key indicators. The majority of respondents reported an increase in emotional awareness (63.3%), which is the initial stage in the emotion regulation process according to the models of Thompson (1994) and Gross (2014). Increased emotional awareness allows individuals to recognize their internal affective state before responding further. Recent neurocognitive research confirms that increased emotional awareness correlates with activation of the medial prefrontal cortex, which is involved in emotion monitoring.

Furthermore, more than half of the respondents reported cognitive change (reappraisal) and control of negative emotions (51.1% each). These findings support the process-oriented

emotion regulation model proposed by Gross (2014), in which reappraisal is an adaptive emotion regulation strategy associated with reduced anxiety. Longitudinal studies over the past five years show that individuals who consistently use reappraisal have lower anxiety levels and better psychological well-being [12]. Recent experimental research shows that expressive writing effectively reduces anxiety and improves emotional regulation through a top-down control mechanism involving the dorsolateral prefrontal cortex [13] [14]. Thus, the combination of religious music (bottom-up stimulus) and expressive writing (top-down process) forms a complementary multimodal intervention. The emotion-based motivation aspect was the highest indicator of emotional regulation in this study (77.8%). This shows that religious music not only calms emotions but also increases psychological energy and goal orientation. This finding is consistent with recent educational research indicating that positive emotions mediate the relationship between emotional regulation and students' academic engagement [15].

In addition, more than half of the respondents reported an increase in interpersonal emotional regulation (51.1%). Music with spiritual values is known to increase empathy and understanding of other people's emotions. Recent studies in social psychology show that music with moral and spiritual themes can increase affective empathy and social sensitivity by activating the social brain network [16]. Overall, the findings of this study support the applied science education framework, in which emotions are understood as neuropsychological responses that can be measured quantitatively using indicators of emotional emergence and regulation. The analysis of the percentages of affective and negative emotions provides an empirical picture of the dynamics of students' emotional responses to music- and writing-based interventions, which have been studied more frequently qualitatively. Thus, this study expands the contribution of science education research to understanding the interaction among auditory stimuli, cognitive processes, and students' emotional regulation.

## **Conclusion**

This study shows that the combination of religious instrumental music and expressive writing effectively shapes adaptive emotional profiles among vocational high school students. This intervention predominantly elicits positive and reflective affective emotions rather than negative emotions, while supporting various indicators of emotional regulation, such as emotional awareness, cognitive reappraisal, negative emotion control, emotion-based motivation, and interpersonal emotional regulation. Scientifically, mapping the percentage of emotions provides empirical evidence that emotion regulation can be studied quantitatively within the framework of science education. These findings reinforce the position of music- and writing-based interventions as a measurable approach to supporting students' emotional health in formal educational settings, as well as opening opportunities to develop learning strategies



that systematically integrate affective aspects, informed by data.

## Recommendations

Further research should use experimental or quasi-experimental designs with control groups to test the causal effectiveness of the combination of religious instrumental music and expressive writing on changes in anxiety and emotional regulation. In addition, research can develop more objective measurements by combining standard psychological instruments and physiological indicators, such as heart rate or cortisol levels, so that emotional responses can be analyzed more comprehensively from a scientific perspective. Further research also needs to involve a more diverse population, including vocational high school students and other educational levels.

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