



A Pilot Study Evaluating the Effects of Relaxation Music Played on Quartz Crystal Singing Bowls on Mood in Teenage Males

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Abbreviations: ANOVA: Analysis of Variance; MANOVA-RM: Multivariate Analysis of Variance for Repeated Measures; NZ: New Zealand; POMS-A: Profile of Mood States-Adolescents.

Abstract

Purpose: Mental health problems and suicide rates are high in New Zealand (NZ) adolescents, particularly in males. Psychopharmacological treatments are often not recommended for subsyndromal mood disorders and, even when indicated, can have detrimental side effects. Moreover, some psychosocial interventions are expensive or inaccessible. Alternatives to psychopharmacological and psychological modalities are worth exploring given the magnitude and consequences of untreated mental health conditions. This pilot study evaluated the effects of music played with crystal singing bowls on mood in adolescent males.

Methods: Participants completed a baseline Profile of Mood States - Adolescents (POMS-A) and then listened to relaxation music played on singing bowls for 25 minutes. The POMS-A was completed immediately post-intervention, then 1 and 3 weeks later.

Results: In total, 11 participants attended the session and completed pre- and post-intervention POMS-A questionnaires. MANOVA-RM analysis showed a significant reduction in depression scores immediately post-treatment ($p=0.026$). Univariate ANOVA analysis showed the reduction in immediate post-treatment depression scores was significant ($p=0.029$) and in tension scores was borderline ($p=0.071$).

Conclusions: In this pilot study, listening to crystal bowl relaxation music was associated with a significant improvement in mood in adolescent males. These findings may stimulate studies with larger sample sizes and longer follow-up periods to further investigate alternative strategies for improving mental health in adolescents.



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Introduction

Anxiety, depression, sleep disorders, [1,2] stress, [2] and suicide, [3] are high in the adolescent population of New Zealand. Suicide rates amongst NZ adolescents (aged 15-19 years) are the highest of any developed country, particularly among Māori and Pasifika ethnic groups [4-6]. While such population-based studies have helped raised our awareness of mental health morbidity in this vulnerable population, little is known about what can prevent or improve their mental health problems.

Some studies have shown musical interventions can reduce depression, anxiety and sleep problems in adults and adolescents [7,8]. Music played on Tibetan “singing bowls” has been reported to induce relaxation and reduce physiological stress [9-11]. An observational study investigated the effects of singing bowl sound meditation on mood, tension and well-being, and found participants reported significantly less tension, anger, fatigue, and depressed mood [9]. Participant’s naïve to singing bowl sound meditation experienced a significantly greater reduction in tension compared with participants experienced in such meditation. Considering the low-cost low technology aspects of singing bowl meditation and its beneficial effects on tension, anxiety, and depression, the applicability of similar interventions is worth investigating.

Importantly, while Tibetan or quartz Crystal Singing Bowls (CSB) are traditionally associated with improved mental and physical wellbeing, they have not been subjected to rigorous research [9]. A few studies have investigated the physics of Tibetan or quartz crystal singing bowls, including the sonic and wave properties, as well as attempting to model the singing bowl’s acoustic characteristics [12-14]. Some attempts have also been made to explain the link between the physics of these methods and the effect on the brain. In particular, the binaural beats generated by CSB or Tibetan bowls, in which two sounds with slightly different hertz levels are played in both ears, direct the brain to “entrain” the difference between the two hertz levels and thus enter into a deep meditative state [15-18]. The deep meditative state induced by binaural beats from CSB has been proposed as beneficial for mental wellbeing [19].

In addition to investigating the physics and explanatory models as to why crystal bowls may promote wellbeing, some authors have investigated their effectiveness in clinical settings. In one study, singing bowls in combination with deep breathing, visualization, and a loving kindness meditation enhanced psychological functioning in a group of high-risk youth with history of poverty, sexual and physical abuse, and/or current risk for perpetrating abuse [20].

More studies are needed to explore whether listening to crystal bowls can lead to a sustained improvement in mood, as opposed to feelings of relaxation or reduced stress solely during the listening period. This pilot study aimed to evaluate the effect of music played on CSB on short-term changes in mood in adolescent males.

Material and Methods

This pilot study used a pre-test/post-test design and was conducted at Waikato Hospital, Hamilton, New Zealand. Ethics approval was obtained from the Northern B Health and Disability Ethics Committee.

Participants volunteered in response to a verbal announcement. Participants were male high-school students aged 16-17 years of various cultural backgrounds (Māori, Asian, NZ European) with normal hearing and fluency in English. None of them were taking psychotropic medication and all gave written informed consent. Mood was assessed using the POMS-A questionnaire, which is regarded as a valid indicator of mood state for culturally diverse population [21,22]. Participants were asked to focus on having a good night of sleep and avoid consuming alcohol, drugs, or caffeine prior to the intervention. Compliance with these exclusion criteria was assessed by a questionnaire pre-test. In the 24 hours pre-intervention, one participant reported consuming alcohol and two others reported consuming caffeinated drinks. They were excluded from the study. Participants lay on mats in a dim room while a musician played relaxation music on CSB for 25 minutes [23]. The musician did not communicate with the subjects otherwise. The POMS-A mood assessment questionnaire was administered on four occasions: immediately pre-test, immediately post-test, 1 week post-test, and 3 weeks post-test. Overall, 11 participants completed the pre- and post-test questionnaire, while 6 participants completed it at weeks 1 and 3.

The means of within-subject post-test differences from baseline in POMS-A subscale scores for tension, anger, fatigue, depression, vigour and confusion were used to analyse intervention effects. Multivariate Analysis of Variance for Repeated Measures (MANOVA-RM) was used to examine changes in all six subscales simultaneously. Due to missing data for later time points, separate repeated measures ANOVA were used, with time as a within-subject factor. Univariate ANOVA evaluated acute within-subject differences in POMS-A subscale and the persistence of changes one and three weeks later. R statistical software [24] was used for analyses, and $p < 0.05$ indicated statistical significance.

Results

POMS-A sub-scores for all participants at baseline, immediately post-session ($n=11$), and one and three weeks ($n=6$) are shown in Figure 1. Univariate ANOVA analysis showed a significant reduction in the mean depression score ($p=0.029$) and this was also observed in the MANOVA-RM ($p=0.026$). The mean tension score approached significance ($p=0.071$) on univariate ANOVA analysis. The results of the full statistical analysis are shown in Table 1 and Figure 1.

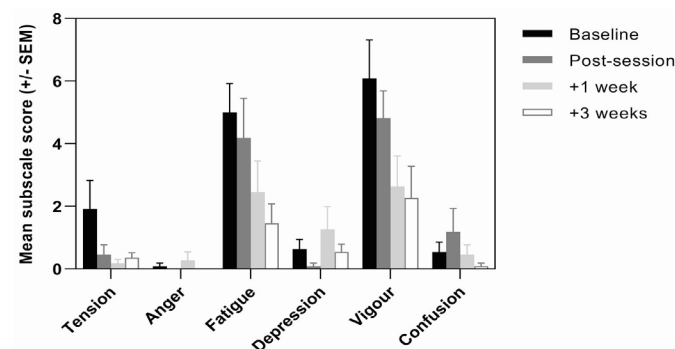


Figure 1: POMS-A subset data (mean +/- SEM) at each assessment ($n=6$).

Table 1: Univariate and multivariate repeated measures within-subject ANOVA of POMS-A subset scores (n=6).

Mood Factor	Df	Univariate		Multivariate	
		F	p	F	p
Tension	3	2.73	0.071*	1.47	0.244
Anger	3	1.28	0.307	1.33	0.282
Fatigue	3	0.87	0.474	0.62	0.607
Depression	3	3.71	0.029*	3.55	0.026*
Vigour	3	1.25	0.214	0.49	0.693
Confusion	3	0.79	0.515	0.56	0.646

Discussion

Despite the small sample size in this pilot study, a single exposure to singing bowl music improved mood symptoms immediately post-treatment in adolescent males, which warrants discussion.

Currently, the main strategies for improving mood include psychopharmacological and psychosocial interventions. Although psychopharmacological interventions are effective in the treatment of moderate to severe depression, they have associated side effects [22]. Psychosocial interventions are also effective in improving mood, but require a high level of specialist training and are expensive, thus limiting their availability [22,25]. Moreover, some adolescents experiencing low mood may not be suitable for psychopharmacological interventions and may not have access to psychological treatment modalities. Our study showed CSB music resulted in rapid improvements in mood in adolescent males, without the side effects or expenses associated with the strategies outlined above. Furthermore, the participants experienced improved mood by simply lying down and listening to singing bowls as opposed to practising meditation, which requires time, patience, and discipline to learn [9].

This study has several weaknesses. First, the sample size of 11 participants was small, so the results should be considered exploratory. Second, only 6 participants completed the longer-term follow-up questionnaires, which reduced the study's ability to detect longer-term effects. Third, the follow-up period was short, with the longest follow-up assessment occurring at 3 weeks.

In conclusion, this small pilot study showed that a single exposure to singing bowl music resulted in immediate improvements in mood in adolescent males. Although encouraging, these findings need to be confirmed by larger studies with longer follow-up periods.

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Potential Conflicts of Interest

Michael Jameson is the spouse of the musician who played the music in this study. No potential conflicts of interest for other authors.

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Annie Jameson composed the music and played the crystal singing bowls. No other person contributed significantly to this study.

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