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THE EFFECTIVENESS OF IMPROVISATIONAL MUSIC THERAPY ON EMOTION REGULATION OF CHILDREN WITH AUTISM SPECTRUM DISORDER: RANDOMISED CONTROLLED TRIAL

Maria Tifani Hertanto[1] | Arutala Music Therapy
Bandung, Indonesia

Abstract:
Children with Autism Spectrum Disorder (ASD) show deficits in social interaction and social communication. There are some physical and psychological problems. Some children with autism spectrum disorder exhibit difficulties in expressing their emotions. However, emotions play a crucial role in social interaction and communication. Various music therapy methods have been developed to support emotional expression in this population, one of which is improvisational music therapy. This study was aimed to know the effectiveness of improvisational music therapy for children who were diagnosed with autism spectrum disorder in terms of emotion regulation. The design of this research is a quantitative method using randomised controlled trials (RCT). Pre- and post-tests were used in this study. The tool of this research is the Difficulties in Emotion Regulation Scale (DERS). The result of this RCT maps the effectiveness of improvisational music therapy for emotion regulation. Improvisational music therapy can be used by children to express their emotions freely. This study demonstrates that participants

were able to regulate their emotions and exhibited significant positive changes in perception building. The findings suggest that improvisational music therapy can be a valuable intervention for other populations experiencing difficulties with emotional regulation and a means to find connections between the mind and the events in the real world.

Keywords:
music therapy • *musical improvisation* • *emotion regulation* • *children with ASD* • *autism* • *perception building*

Introduction

The statistics of children diagnosed with Autism Spectrum Disorder (ASD) is increasing every year. As shown by the Australian Institute of Health and Welfare (AHIW, 2017) it is estimated 164,000 people have autism with 1 in 150 Australians. Most of them were children and young adults. Autism spectrum disorder (ASD) is characterised by "persistent deficits in social communication and social interaction across multiple contexts, accompanied by restricted, repetitive patterns of behaviour, interests, or activities" (American Psychiatric Association [APA], 2013). On the other hand, World Health Organization (WHO, 2019) described it as "some degree of impaired social behaviour, communication and language, and a narrow range of interests and activities that are both unique to the individual and carried out repetitively".[4]

ASD is distinguished by two categories of characteristics, they are (a) social interaction and communication problems; (b) restricted and repetitive patterns of behaviours, interests, or activities (Copeland, 2018). Moreover, Copeland explains more about children who had difficulties in social interaction and communication problems also had difficulty in normal conversation; sharing their interests or emotions; understanding or responding to social cues such as eye contact and facial expressions; and developing, maintaining or understanding relationships, particularly in making friends. On the other hand, any repetitive behaviours that they like such as flapping or walking, speaking in a unique way, predictable routine,

exhibiting uncommon activity interests for a similar-aged child, and sensitivity for their sensory aspects (such as pain/temperature, smelling or touching objects, or loud noises).

Not only are the weaknesses shown by children with ASD, but they also have strengths. Research Autism (2017) states that a good eye for detail, a high level of accuracy and reliability, excellent memory for facts and figures, the ability to thrive in a structured, well-organised work environment, and considerable creative talent are examples of their strengths. Adding to that, it describes some physical and psychological problems that may accompany the autism spectrum, such as sensory sensitivity, epilepsy, gastrointestinal problems, anxiety, and depression. Depression and anxiety are examples of negative emotions that may influence their emotion regulation in the future.

Research Problem

This study emphasises on emotional regulation. Lombardo et al. (as cited in Shanok et al. 2019:661) describes an observation in their case study that individuals with ASD showed social and emotional impairments. Children with autism spectrum have difficulty in expressing their emotions (Copeland, 2018). This may influence their social interaction. In some situations, children with autism spectrum can change their emotions easily. Some show difficulty in controlling their emotions. Moreover, when they experience negative emotions, it can influence their behaviour. However, children with ASD face difficulty in recognizing negative rather than positive expressions (Shanok et al., 2019).

Music is a vital cultural element that is appreciated and accessed by people of all ages across diverse populations. Many children engage with music through various platforms such as YouTube, Spotify, Apple Music, and even within games and movies. It was supported by some researchers that music therapy is one of the treatments that can be used for children with autism (Reschke-Hernández, 2011:169-170). Many music therapy methods can be addressed for emotion. One of the methods is improvisational music therapy. Pelliteri (2009:81) suggests that musical improvisation is an emotional expression that helps the client to express his/her emotions in verbal and nonverbal ways. The client is given the

freedom to make a melody or lyric to express their emotion. Each musical element created by the participants reflects their emotional expression.

Research Aims

This study was undertaken in randomised controlled trials to examine the influence and effectiveness of improvisation for emotional regulation for children with ASD. Thirty random children between ages 9-12 came to music therapy sessions for 24 sessions. Data were collected using the Difficulties in Emotion Regulation Scale (DERS) and through observational methods to analyse the results. The research used pre- and post-test methods. Before starting the program, the participants were asked to complete the questionnaire and after they finished the session, they were asked again to fill out the same questionnaire to get the results.

The aim of this study is to know the effectiveness of improvisational music therapy for children who were diagnosed with autism spectrum disorder in terms of emotion regulation. It is hypothesised that children with ASD will demonstrate positive changes in emotional regulation. They could regulate their emotions better than before the session started. It is expected that the outcome will contribute for further research in this area of music therapy while providing a practical and sustainable treatment approach for children with ASD.

Literature Review

Autism Spectrum Disorder is characterized by any impairment in social communication and social interaction, accompanied by restricted, repetitive patterns of behaviour, interests, or activities. Usually, the signs of autism spectrum appear in childhood. Some researchers mention that the autism spectrum is four times more common in boys than girls (AHIW, 2017; Copeland, 2018). WHO (2019) described that usually, individuals with ASD present other conditions such as epilepsy, depression, anxiety, and attention deficit hyperactivity disorder (ADHD). Moreover, this article also mentions that the level of intellectual conditioning depends on the autism level which is from profound impairment to superior levels.

Emotional Regulation

Emotion is "an experience or mental state characterized by a strong degree of feeling and usually accompanied by motor expression, often quite intense" (Warren, 2018:238). Emotions drive individuals to act in specific ways. For instance, when someone feels angry, he or she may yell at another person or, conversely, become very quiet and withdraw from conversation. Similarly, when an individual experiences fear, she might act with heightened caution or engage in bold, unexpected behaviours that had not been previously anticipated. Every emotion has two different extreme activities. Emotion is part of the emotion regulation mechanism.

Emotion regulation refers to "shaping emotions one has, when one has them, and how one experiences or expresses these emotions" (Gross, as cited in Gross 2015:6). Emotion regulation is how to control a person's emotions consciously or unconsciously. Hides et al. (2019:24) describe the goal of emotion regulation skills interventions as to reduce the risk of anxiety or depression disorder and help a person to gain the solution of these disorders. Hou et al. (2017:501) suggest that emotion regulation is a complex process across subjective experience (feeling states), cognitive responses (thoughts), autonomic responses (physical reaction), and emotion-related behaviours (e.g. bodily actions and facial expressions). To describe emotion regulation, Gratz & Roemer (2004:52) explain the dimensions of emotional regulation which are (a) nonacceptance of emotional responses; (b) difficulties engaging in goal-directed behaviours; (c) impulses control difficulties; (d) lack of emotional awareness; (e) limited access to emotion regulation strategies; and (f) lack of emotional clarity.

Gratz & Roemer (2004:47) discuss more about the dimension of emotional regulation, which is "lack of emotional awareness consists of items reflecting the tendency to attend to and acknowledge emotions". In this context, the item in this aspect is designed to evaluate whether individuals are capable of recognizing their emotions or not (Hallion et al., 2018:9). Knowing their emotions helps the individuals to clarify their feelings or emotions. Thus, the second dimension focuses on helping individuals clarify their emotions. The items related to a lack of emotional clarity assess how well individuals can accurately identify and understand their emotions.

Nonacceptance of emotional responses' item reflects an individual's negative secondary emotional response and how the individual responds to others' negative emotions or non accepting reactions to their distress. To regulate emotion, individuals need to tolerate negative emotion and do the right reaction. Individuals who can regulate their emotions do not give an excessive reaction, but it must be reasonable. Thus, individuals need strategies in coping with negative emotions. The other dimension is impulse control difficulties. It aims to assess how far individuals can control their behaviour when they are experiencing negative emotions. Individuals who can regulate their emotions can control their behaviour. It is more difficult when they experience negative emotions.

The next dimension is limited access to emotion regulation strategies. The item of this dimension reflects their behaviour when experiencing negative emotion. This dimension explains more about how important individuals' strategies are to regulate their emotions effectively. As the last dimension, individuals need to know the goals. Difficulties engaging in goal-directed behaviours' items reflect the difficulties in concentration and accomplishing tasks when experiencing negative emotions. In this area, every dimension is related to each other to help individuals with emotion regulation.

Emotion Regulation and Autism Spectrum Disorder

Emotion regulation is not included in the Autism Spectrum Disorder (ASD) definition. The definition of ASD is characterized by deficits in social communication and social interaction (APA, 2013). Also, APA (2013) described that individuals with ASD showed repetitive and restricted patterns of behaviour, interests, or activities. However, some researchers (as cited in Samson et al, 2015:9) explain that emotion regulation abilities are crucial for social interactions because they help individuals to cope with changing situations and stimuli. In the real world, children with ASD need to be more flexible to face their environment. One of the autism spectrum's problems is that they cannot think in flexible ways. They will be comfortable when everything is predictable. When children with ASD demonstrate emotional dysregulation (for example aggressive or temper outbursts), it could make their environment feel uncomfortable, and they

did not want to have a communication or social interaction with them. Children with autism need to control their emotions when they are outside their house and need to socialize with their peers or older or younger people. In other cases, they also need to tolerate the occasion that will face them in the real world in social settings.

Music Therapy

Music has an important role in an individual's life. Many people listen to radio, music platforms (for example Apple Music, Spotify, YouTube), or television. When referring to Churchland, Watson says that "when we hear sounds, there are in the brain physical manifestations that constitute a map of the original stimulae on the sense organ. Thus, there is in the brain a representation that is similar to, like, isomorphic with – that resembles – its object in the world" (Watson, 1995:103). Watson further says that there is a "pattern transferred from the brain representation to a separate mind representation". This pattern can be considered as a connecting point that might help a person's mind find its 'harmony' in the world.

Music therapy can be seen as a way of connecting the mind's activities with melodies heard by the senses. Children have different favourite songs which can help them rebuild themselves through the musical patterns heard. Every song has different musical elements, such as dynamic, rhythmic, tempo, and melody, which influence the children's emotion. Nordoff and Robbins (2007:49) emphasise the innate musicality present in every child, focusing on how individuals respond to musical experiences, find them meaningful and engaging, remember the music, and enjoy it as a medium for expression, communication, and sharing.

The concept of "musicality in children" does not focus on a child's musical talent, but rather emphasizes their innate sensitivity to music. Music therapy helps individuals in some respects such as social interaction, communication, emotion, and physical. Music can be used for muscle exercise. For example, children may jump and move energetically while listening to songs. Not only physics, but they also learn how to listen to lyrics and try to do it. It helps them with concentration and social interaction. Music reflects individual interaction with surroundings. For example, an individual who struggles with social interaction may have difficulty waiting

for their turn, tolerating others, and actively listening to them.

Thus, music gives a chance for an individual to promote reciprocal respect, acceptance of individual differences, and social integration by working creatively (Nöcker-Ribaupierre & Wölfl, 2010:151). Many children with ASD show that it is difficult to accept individual differences. Also, music could help individuals to express their emotions. Individuals often play or listen to music that reflects their emotions at the time; for example, children may play loudly with dense musical elements when they feel angry. On the other hand, individuals who experience sadness tend to play at low volume with a slower tempo. Pelliteri (2009) explains that music can be used by parents to soothe infants when they are crying, such as using a lullaby to calm them and help regulate their emotions.

Music Therapy Method

Bruscia (2014:127) describes four main music therapy methods. They are improvisational, re-creative, compositional, and receptive. Each method has different goals that could be reached. The improvisational method is when the individual creates the melody, rhythm, song, or instrumental pieces by playing or singing (Bruscia, 2014, p. 130). In this case, the therapist will give the individual the freedom to play music. A lot of instrumental music that could be used as an option, such as piano, guitar, or drum. Also, it could be humming or substituting the song's lyrics. Improvisation gives the individual the freedom to express their emotion.

Another method is the re-creative method, which requires the individual to learn to play or sing and perform precomposed music (Bruscia, 2014:131). The individual needs to learn the song and it may be performed with or without an audience. Bruscia (2014:133) describes another method known as 'compositional', which involves the individual creating a new song, writing lyrics, or composing an instrumental piece. It can also be recorded as a musical product, such as a music video or audiotape. Using this method, the individual expresses themselves through the lyrics and song they create. While performing the song, they can record it to remember and revisit their work.

The last is the receptive method, in which the individual listens to the music (Bruscia, 2014:134). They may respond either silently or verbally.

The therapist can discuss the song with the individual or with others if the session takes place in a group. Each person may have a different interpretation of the same song. In this method, individuals often select their favourite songs or those that reflect their current emotional state.

Improvisation Music Therapy and Emotion Regulation

Improvisation is one of the methods which can be used to express their emotion. Nordoff and Robbins (2007) suggest the improvisational approach, which places greater emphasis on the individual. Some research used improvisation music therapy to help children with ASD get better in their communication skill (Salomon-Gimmon & Elefant, 2018; Wigram. & Gold, 2005). Improvisation could be done in many ways, such as substituting the song's lyrics or making a new melody with instrumental music (e.g. djembe, piano, or guitar). Improvisation and composition have similar methods. However, the individual will only change one of the music elements in the improvisation.

In improvisation, the therapist's role is to match the individual's emotion with the music. The therapist needs to be sensitive to know the individual's emotion at that time and help them to express it through instrumental music or lyrics. The children with ASD often repeat the melody that they make at that time. Some of them also demonstrate it in different sessions. It was the therapist's role to make a harmonic with simple notes and assist them in finishing the improvisation and making the song clear. Sometimes, the therapist needs to match with the individual's movement in improvisation. The therapist could play major or minor chords and follow the individual's movement by playing a certain rhythm.

Matching the music with the individual's movement could be a way to make the individual feel comfortable with the therapist. The therapist can play the music together with the individual. As a result, it resembles a non-verbal form of communication between the therapist and the individual. Improvisation is a live musical interaction using active communication which requires some effort (Odell-Miller as cited in Pelliteri, 2009). At the same time, the human brain becomes flexible to adapt and manipulate its surroundings. As part of communication, the individual could express their emotion through improvisation using different musical elements, such as dynamic, rhythmic, tempo, and melody.

Pelliteri (2009) describes that relaxed emotions are an important part of emotional regulation. It increases the capacity for impulse control and tolerance for frustration. In this situation, the music therapist's role is to foster ego development. It helps the individual to self-control and release the tension. During improvisation, children who showed emotion dysregulation problems often had diminished self-control. It proved that every musical instrument played by each individual will reflect his or her emotion and thought at that time. Since music can serve as a catalyst for human emotions, it can assist individuals in regulating their emotional responses, particularly when dealing with unpleasant emotions. (Pelliteri, 2009 p. 132). The method that is used by the therapist depends on the goals they want to achieve. For example, when the individual's goal is to make the individual feel comfortable, the therapist could assist them by matching the music with the individual's emotion at that time. However, when the individual's goal is to make the individual adapt to their unpleasant emotion, the therapist could improve as opposed to the individual's emotion. Thus, the individual could learn how to adapt and tolerate the situation.

Tolerance is needed to help the individual with flexibility. Most of the children with ASD show difficulty in tolerating something new or something that is out of their expectations. The fact is humans cannot predict the occasion in the future. Thus, the flexibility to face the problem in the future is needed. Improvisation in music therapy can help participants cope with these challenges. Initially, the individual may tend to repeat patterns, and the therapist can encourage them to explore new approaches each week, while still ensuring they remain within their comfort zone.

Methodology

Participants

The participants for this research are 30 children between the ages of 9-12 years old. The participant should be diagnosed with Autism Spectrum Disorder (ASD) according to DSM-V guidelines. Additionally, the participants must exhibit difficulties with emotional regulation, as evidenced by frequent and noticeable changes in their emotional state.

They were selected from the Western Sydney region and randomly assigned to participate in a music therapy session. The participant has not attended any other music therapy sessions, or at least not within the past 12 months.

Research Design

The method that was used for this study is the quantitative method. Randomized Controlled Trial (RCT) was used to gather quantitative data. All participants were given the same approach. Every participant had 24 sessions for 30-minutes for each session. The Registered Music Therapist (RMT) conducted the sessions once a week for individual sessions. This study used a pre-and post-test design. The participants were asked to complete a questionnaire about emotional regulation before starting the program. And then, the participants need to join the session. In every session, the participants are asked to improvise using piano. After finishing the program, the participant was asked again to complete the session. The data were processed by comparing before and after the program. The participants were accompanied by their parents or caregivers while completing the questionnaire. The parents or caregivers could help them in completing the questionnaire by their observation.

Data Analysis and Interpretation

This study uses quantitative data. The instrument used in this study is the Difficulties in Emotion Regulation Scale (DERS) (See Appendix A). Also, some observation is needed to analyse the results. The questionnaire is on a rating scale. The rating is between 1 (rarely) to 5 (almost always). This questionnaire has 36 items which are valid and reliable for adults. However, this questionnaire was used for children in this study. The result was calculated and compared before and after the program. Every dimension was summed unless for lack of emotional dimension and several items from another dimension which the calculation was reversed (See Appendix B). Also, the researcher will compare which gender has more impact after following this program.

Instruments

The tool used in this study is a questionnaire. The type of this questionnaire is self-report which is developed to assess difficulties in emotional regulation. Gratz & Roemer (2004, p. 52) propose a questionnaire based on 6 emotional regulation dimensions which are (a) nonacceptance of emotional responses; (b) difficulties engaging in goal-directed behaviours; (c) impulse control difficulties; (d) lack of emotional awareness; (e) limited access to emotion regulation strategies; and (f) lack of emotional clarity. Every dimension consists of 5 to 8 items.

Session Structure

The sessions were conducted using the improvisation method with voice and piano. During a piano session, the participant was asked to play the upper keys of the piano while the therapist assisted by playing the lower keys. Every participant received the same sessions. The session was divided into three parts. In the first 8 weeks, participants engaged in voice improvisation, either humming or singing together. This phase was designed to make participants feel comfortable and prepared to play the piano, as well as to introduce them to the improvisation method. For the next 8 weeks, they were encouraged to play the piano freely. The goal was to help participants become more comfortable and able to express their emotions more effectively. In the final 8 weeks, participants were asked to improvise by playing only the black keys.

In the initial session, the participants were introduced to the therapist. The session began with group singing alongside the therapist. Participants were then asked to hum or improvise lyrics, which was intended to help them feel comfortable in the new environment and with unfamiliar people. This process continued until week 8. The aim of this session was for the participants to become more comfortable over time, as improvisation can be a means of emotional expression (Pelliteri, 2009; Nordoff & Robbins, 2007). Prior to the first session, the participants were required to complete the DERS questionnaire, with assistance from the therapist to ensure accurate responses.

From week 9 to 16, the improvisation method used a piano. The client was asked to play freely but in higher octaves, while the therapist matched them by playing the lower octaves. The role of the Registered Music Therapist (RMT) was to assist the participants in their improvisation. Some participants played freely, while others repeated the same notes. In such cases, the RMT attempted to create harmony with the participants' improvisation. In the last 8 weeks, the participants were asked to play only the black keys. It was expected that by the end of the program, participants would follow the rules and regulate their emotions more effectively. Each session lasted for 30 minutes.

Issues of Reliability and Validity

The study may include participants who have a comorbid diagnosis. This condition may affect the participant's response during the session. The other conditions that may affect this result were the activities before starting the sessions and the factors outside the therapy sessions. Also, it could be influenced by another kind of therapy such as behavioural, speech, or occupational therapy.

Ethical Considerations

Before the programs began, the caregivers or parents were asked to fill out a consent form on behalf of their child. The identity of the participants and their responses were kept strictly confidential. Participants were permitted to exit the study at any time.

Anticipated Outcomes

This study aims to know the effectiveness of improvisational music therapy for emotional regulation. The hypothesis of this study is the possibility of children with Autism Spectrum Disorder (ASD) demonstrating positive change in emotional regulation. Emotion regulation is a complex process involving several different aspects, such as subjective experience, cognitive, and autonomic responses, and emotion-related behaviours (Hou et al., 2017:2). The anticipated outcome of this study was that the changes in the participants' emotional regulation would

be significant. It was shown in the DERS questionnaire as a tool to assess participants' emotional regulation. Besides, the changes were demonstrated in their daily behaviour and when they came to the room before and after the session. Thus, the results prove the hypothesis of the study.

Before the program, many children with ASD showed low scores in many dimensions. Also, it was shown during the sessions. The participants have difficulty in controlling their actions during the session. Some of them could sit on the chair, but many of them still ran around inside the room. While introducing Registered Music Therapy (RMT), the participants appeared uncomfortable, possibly due to encountering a stranger for the first time. The first 8 weeks were made to help the participants be more comfortable. However, not all participants were able to engage in voice improvisation. Some of them were shy or aware of the new situations and new people inside the room. Also, some participants demonstrated doubtful behaviour when the therapy started to encourage them to sing together. This behaviour decreased slowly, and they showed more confidence in the next few weeks.

Improvisational music therapy is one way to express children's emotions, and here they can play freely to show their emotions. The participants showed different feelings every week and this experience brought different patterns captured in their brains. It could be seen in the improvisation program during the session. Churchland (as cited in Watson, 1995:103) argues that if the mind is identical to the brain, then the "phenomenal representations" in the mind must correspond to physical representations in the brain. There must be an 'interaction' between the sound as a phenomenal representation in the mind and the physical sound event in the outside world. As described by Moore (as cited in Hou et al., 2017:2), music can be used as an intervention strategy for emotional regulation as it may improve the ability of emotional regulation especially in happy or pleasant feelings.

Thus, the musical elements that were used by the participants reflect their emotions. When individuals feel happy or excited, loud music with a fast tempo may be used to reflect or enhance their emotional state. Some participants will listen to slow music and smooth in volume to reflect unpleasant feelings. The participants' emotion could be influenced by the occasion that happened before the session started or a whole week. Thus, improvisation is able to be used as a tool that can be used for communication

through music. Participants could show their feelings through instrumental music. In the piano sessions, some of the participants looked happy but some of them looked confused and worried if they made mistakes. When they feel angry or sad before coming into the session, some participants may feel better at the end of the session. However, not all participants exhibited a change in mood after the session.

Some participants repeated certain musical notes several times during the sessions. It was one of the characteristics of the autism spectrum. The repetition made them feel comfortable because it was predictable. Sometimes the participants will face something unpredictable in real life. So, the participants need to be prepared for something unpredictable. In this case, improvisation will help them to face unpredictable moments because improvisation could not be predicted before the sessions. It could be done repeatedly or without any pattern. These findings align with the theoretical framework proposed by Churchland concerning the role of auditory phenomena in perception building.

The emotion was changed to a positive result. This may be because the participants became more comfortable after several sessions with the same Registered Music Therapist (RMT), even though the treatment changed every eight weeks. Also, the improvisation may influence their emotional regulation. As described by Gratz & Roemer (2004:52), the dimensions of emotional regulation are (a) nonacceptance of emotional responses; (b) difficulties engaging in goal-directed behaviours; (c) impulse control difficulties; (d) lack of emotional awareness; (e) limited access to emotion regulation strategies; and (f) lack of emotional clarity. The results showed positive changes for almost every dimension. It was also shown during the sessions, the participants showed the strategies to face unpleasant emotions. They could tolerate and cope with the negative emotions.

During the program, participants showed behaviour changes from one to another session. For instance, aggressive behaviours such as punching or kicking themselves or others, yelling, or running around the room decreased over time. These were initially observed outside the session room before the therapy began. The improvement in emotional regulation likely contributed to better social interactions, as emotional regulation is a key factor in managing social interaction challenges. Interacting with peers or others requires tolerance for different perspectives and behaviours.

The ability to tolerate others may improve because improvisation teaches participants to adapt to unpredictable moments. In addition, the participants also learned to communicate their emotions through improvisation. Improvisation helps them express negative emotions through music. It may make the participants know that there is a way to express negative emotion without yelling or doing aggressive behaviour. It also helps them to reach another goal that has been made for them. This research can be used to support the improvisational music therapy application. This method was not only useful for communication but also for emotion regulation.

Limitation

The limitation of this study is the small sample size, which may result in findings that are not fully representative of the broader scope of research in this field. Also, it may be influenced by the comorbid diagnosis of ASD, such as different levels of anxiety, ADHD, or any other diagnoses. The other factor that may influence this study is the cultural differences. Many people came from different cultures in Sydney. This condition may yield different results in another experiment. In the future, other researchers may be able to replicate this study by adjusting variables such as the program duration and sample size. The program may be extended beyond 24 weeks or shortened, and sessions could be conducted more than once a week.

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Appendix A

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1	2	3	4	5
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

_____ 1) I am clear about my feelings.
_____ 2) I pay attention to how I feel.
_____ 3) I experience my emotions as overwhelming and out of control.
_____ 4) I have no idea how I am feeling.
_____ 5) I have difficulty making sense out of my feelings.
_____ 6) I am attentive to my feelings.
_____ 7) I know exactly how I am feeling.
_____ 8) I care about what I am feeling.
_____ 9) I am confused about how I feel.
_____ 10) When I'm upset, I acknowledge my emotions.
_____ 11) When I'm upset, I become angry with myself for feeling that way.
_____ 12) When I'm upset, I become embarrassed for feeling that way.
_____ 13) When I'm upset, I have difficulty getting work done.
_____ 14) When I'm upset, I become out of control.
_____ 15) When I'm upset, I believe that I will remain that way for a long time.
_____ 16) When I'm upset, I believe that I will end up feeling very depressed.
_____ 17) When I'm upset, I believe that my feelings are valid and important.
_____ 18) When I'm upset, I have difficulty focusing on other things.
_____ 19) When I'm upset, I feel out of control.
_____ 20) When I'm upset, I can still get things done.
_____ 21) When I'm upset, I feel ashamed at myself for feeling that way.
_____ 22) When I'm upset, I know that I can find a way to eventually feel better.
_____ 23) When I'm upset, I feel like I am weak.
_____ 24) When I'm upset, I feel like I can remain in control of my behaviors.
_____ 25) When I'm upset, I feel guilty for feeling that way.
_____ 26) When I'm upset, I have difficulty concentrating.
_____ 27) When I'm upset, I have difficulty controlling my behaviors.
_____ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.
_____ 29) When I'm upset, I become irritated at myself for feeling that way.
_____ 30) When I'm upset, I start to feel very bad about myself.
_____ 31) When I'm upset, I believe that wallowing in it is all I can do.
_____ 32) When I'm upset, I lose control over my behavior.
_____ 33) When I'm upset, I have difficulty thinking about anything else.
_____ 34) When I'm upset I take time to figure out what I'm really feeling.
_____ 35) When I'm upset, it takes me a long time to feel better.
_____ 36) When I'm upset, my emotions feel overwhelming.

Reverse-scored items (place a subtraction sign in front of them) are numbered 1, 2, 6, 7, 8, 10, 17, 20, 22, 24 and 34.

Calculate total score by adding everything up. Higher scores suggest greater problems with emotion regulation.

SUBSCALE SCORING:** The measure yields a total score (SUM) as well as scores on six sub-scales:

1. Nonacceptance of emotional responses (NONACCEPT): 11, 12, 21, 23, 25, 29
2. Difficulty engaging in Goal-directed behavior (GOALS): 13, 18, 20R, 26, 33
3. Impulse control difficulties (IMPULSE): 3, 14, 19, 24R, 27, 32
4. Lack of emotional awareness (AWARENESS): 2R, 6R, 8R, 10R, 17R, 34R
5. Limited access to emotion regulation strategies (STRATEGIES): 15, 16, 22R, 28, 30, 31, 35, 36
6. Lack of emotional clarity (CLARITY): 1R, 4, 5, 7R, 9

Total score: sum of all subscales

**"R" indicates reverse scored item

REFERENCE:

Gratz, K. L. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54.

Appendix B

Table III. Items Composing the Six DERS Factors

Factor	Item
1: Nonacceptance of Emotional Responses (NONACCEPTANCE)	29) When I'm upset, I feel guilty for feeling that way.
	25) When I'm upset, I feel ashamed with myself for feeling that way.
	15) When I'm upset, I become embarrassed for feeling that way.
	14) When I'm upset, I become angry with myself for feeling that way.
	33) When I'm upset, I become irritated with myself for feeling that way.
	27) When I'm upset, I feel like I am weak.
2: Difficulties Engaging in Goal-Directed Behavior (GOALS)	30) When I'm upset, I have difficulty concentrating.
	22) When I'm upset, I have difficulty focusing on other things.
	16) When I'm upset, I have difficulty getting work done.
	38) When I'm upset, I have difficulty thinking about anything else.
	24) When I'm upset, I can still get things done. (r)
3: Impulse Control Difficulties (IMPULSE)	37) When I'm upset, I lose control over my behaviors.
	31) When I'm upset, I have difficulty controlling my behaviors.
	17) When I'm upset, I become out of control.
	23) When I'm upset, I feel out of control.
	4) I experience my emotions as overwhelming and out of control.
	28) When I'm upset, I feel like I can remain in control of my behaviors. (r)
4: Lack of Emotional Awareness (AWARENESS)	7) I am attentive to my feelings. (r)
	3) I pay attention to how I feel. (r)
	12) When I'm upset, I acknowledge my emotions. (r)
	21) When I'm upset, I believe that my feelings are valid and important. (r)
	9) I care about what I am feeling. (r)
	39) When I'm upset, I take time to figure out what I'm really feeling. (r)
5: Limited Access to Emotion Regulation Strategies (STRATEGIES)	20) When I'm upset, I believe that I'll end up feeling very depressed.
	19) When I'm upset, I believe that I will remain that way for a long time.
	35) When I'm upset, I believe that wallowing in it is all I can do.
	40) When I'm upset, it takes me a long time to feel better.
	32) When I'm upset, I believe that there is nothing I can do to make myself feel better.
	26) When I'm upset, I know that I can find a way to eventually feel better. (r)
	41) When I'm upset, my emotions feel overwhelming.
	34) When I'm upset, I start to feel very bad about myself.
6: Lack of Emotional Clarity (CLARITY)	6) I have difficulty making sense out of my feelings.
	5) I have no idea how I am feeling.
	10) I am confused about how I feel.
	8) I know exactly how I am feeling. (r)
	1) I am clear about my feelings. (r)

Note. (r) = reverse-scored item.

Endnotes:

1 Email: mariatifanih@gmail.com.