ORIGINAL ARTICLE

The Effectiveness of Art-based Psychoeducation Module in Improving Psychological Functioning Among Children with Dyslexia

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ABSTRACT

Introduction: Children with dyslexia are susceptible to emotional distress such as anxiety, due to delayed or limited overall academic achievement. This study aims to examine the effectiveness of art-based psychoeducation module in improving psychological functioning among children with dyslexia. **Materials and methods:** Children with dyslexia aged 7 to 12 years old were assigned into intervention (n=33) and control group (n=31). The former group was subjected to a newly validated art-based psychoeducation module which consists of psychoeducation, relaxation techniques, and art therapy activities. PedsQL Present Functioning Visual Analogue Scale (PedsQL-VAS) and State Trait Anxiety Inventory (STAI-C) were used to measure childrens' psychological functioning at pre and post intervention. **Results:** The main effect comparing the intervention and control group over pre- and post- intervention was significant, suggesting the art-based psychoeducation intervention was effective in improving psychological functioning, [$F(1,62) = 5.59$, $p<0.02$]. There was a substantial major effect for time in the intervention group, [Wilks' Lambda = 0.42, $F(1,62) = 83.2$, $p<0.001$] with a significant decrease in score post intervention. **Conclusion:** The effectiveness of art-based psychoeducation module found in the current study provides empirical support for it to be used as an intervention for children with dyslexia. Future studies can focus on a longitudinal approach to examine its long-term effectiveness.
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Keywords: Children, Dyslexia, Psychoeducation, Art therapy, Psychological functioning

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INTRODUCTION

Specific learning difficulties (SLD) is a condition that affects various domains of education and can manifest a unique difficulty in academic performance. The most common type of SLD is dyslexia, which is characterized by difficulties in accurate word recognition and the likelihood of struggling with phonological awareness, which is a central part of the reading process [1]. The second type of SLD involves writing difficulties which is called dysgraphia. Individuals with dysgraphia may have difficulty writing down ideas on paper [2]. The third type is dyscalculia, which is a difficulty in solving mathematical problems [3]. In general, children with SLD often have problems associated with reading, writing, and counting, with symptoms including inaccurate and non-fluent word use and recognition, as well as poor spelling [4]. Due to persistent difficulties in learning, especially within mainstream education, children with SLD, and dyslexia in particular, face many challenges in their daily life.

Failure in literacy has huge effects on the whole academic curriculum and subject performance among students with SLD [5]. Failure at school can lead to a negative self-image as a learner and resulting greater psychological impact [6]. Due to this, various methods of intervention have been utilised to improve the literacy and cognitive abilities of children with dyslexia such as the multisensory method, the phonological intervention, and the cognitive training method. For example, the Davis Module that involved counselling, symbol, and reading techniques to help 9 years old children with

dyslexia. The results showed that the module had helped children to correct their visual perceptions and improve in tracking word recognition [7]. Yet, for lots of available interventions, the main focus has been on improving cognitive and academic performance and little is known and done about the importance of improving emotional and behavioural consequences among children with dyslexia [8]. In Malaysia, a similar situation is also captured, where there are limited studies on managing behaviour and emotion among children with dyslexia. Most of the interventions conducted for children with dyslexia in Malaysia have also focused on improving reading and writing performances, such as phonological interventions, multisensory methods, and cognitive training [9].

Studies have documented that in addition to having difficulties with academic performance, students with dyslexia tend to have higher levels of emotional concerns which can start with anxious feelings [10], frustration [4], anger [11], loneliness [12], low self-esteem [13], social rejection [14], and slowly develop into depression [7], and eventually could lead to suicidal attempt [15]. These are further supported by numerous research regarding the emotional distress experienced by children with SLD. Sahoo and colleagues reported that about 30% of children with SLD have behavioural and emotional problems, and they are at increased risk for other comorbidities [16]. A study by Stathopoulou and Karathanasi found between 40% to 75% of children with emotional difficulties also have learning difficulties [17]. Correspondingly, children with learning difficulties show a higher rate of socio-emotional difficulties compared to their peers without learning difficulties [5].

Psychological intervention is one of the effective methods in reducing negative emotions among children. Psychological intervention is a personal process intended to improve one's moods, thoughts, and behaviour through a variety of approaches and techniques [18]. There are many approaches to psychological intervention such as cognitive behaviour therapy (CBT) [19] and art therapy [20] which include psychoeducation [21] and relaxation techniques [22] as some of the content. Psychological interventions for children with dyslexia may include psychoeducation, CBT, art therapy, and relaxation techniques. Psychoeducation, an intervention that combines psychological and education approaches, has been found to be effective in improving psychological functioning of children with dyslexia [21]. Similarly, art therapy was also found to be commonly used to manage psychological problems among children with dyslexia to reduce internalizing and externalizing problems [20] due to the idea that creating art can be a method of nonverbal communication of thoughts and feeling that provides healing and life-enhancement [23]. Therefore, the current study aimed to evaluate the effects of art-based psychoeducation module which used multiple techniques namely psychoeducation, relaxation, and art therapy techniques in improving psychological functioning among children with dyslexia.

MATERIALS AND METHODS

Participants

Children attending primary school in Kelantan, Malaysia and were diagnosed with dyslexia during the study period (i.e. January through December 2022) were the targeted participants. The sampling frame was established from the list of names obtained from Kelantan State Education Department – who compiled the names of students attending the special education integrated programme for learning difficulties (*Program Integrasi Pendidikan Khas Masalah Pembelajaran*) in Kelantan. In addition, the name list of children diagnosed with dyslexia and attending Occupational Therapy sessions at Hospital USM during the study period was also obtained for the same purpose. Children were included in the study if they met the following criteria: i) Aged between 7 to 12 years old ii) has been diagnosed by a psychiatrist or medical officer for dyslexia, iii) Attending the Specific Learning Difficulties (Dyslexia) Programme in selected schools in Kelantan and/ or attending Occupational Therapy session at Hospital USM for learning difficulties management, and iv) Granted verbal and written consent/assent from the parents and children. Children with comorbid conditions including Attention Deficit/ Hyperactivity Disorder (ADHD), autism spectrum disorder (ASD), global developmental delay, and intellectual disability were excluded. A total of 64 children with dyslexia agreed to participate in this quasi-experimental intervention study. A valid, researcher-developed art-based psychoeducation intervention module was subjected to the intervention group (n=33) and none to the control group (n=31).

Measures

The Pediatric Quality of Life Present Functioning Visual Analogue Scale (PedsQL-VAS) was used to measure children's overall psychological functioning. It is a six-item questionnaire that asks about anxiety, sadness, anger, worry, fatigue, and pain as experienced by the respondents in the present moment [24]. The PedsQL-VAS is calculated by taking the average of all six items. The emotional distress score represents the mean of the anxiety, sadness, anger, and worry items only. Pain and fatigue were conceptualized as individual symptom items, and they are included in the total symptom score. A 10-millimetre line was used to illustrate the assessment where it was anchored at one end with a happy face and at the other end with a sad face, to facilitate the children and young adolescents' self-report. The instructions read as: *"Please put a mark on each line that best shows how you feel now. If you have no problem and feel fine, put a mark at the end of the line by the happy face. If you have some problems and do not feel that well, put a mark near the middle of the line. If you feel very bad or have lots of problems, put a mark by the sad*

face." The reliability of PedsQL-VAS in Bahasa Malaysia has been established among primary school children in Kelantan. The internal consistency reliability was good as the Cronbach's alpha of the scale was high which is 0.86 for six items including anxiety, sadness, anger, worry, tiredness, and pain [25]. Similarly, the present study demonstrated good reliability for the overall score of emotional distress (Cronbach's alpha, $\alpha = 0.75$).

Children's current level of tension and apprehension (i.e., state anxiety) and their susceptibility to anxiety (i.e., trait anxiety) were measured using the STAI-C (Spielberger et al. 1983). The STAI-State comprises of 20 items assessing how children feel "right now" or "at this moment" (e.g., I feel upset), whereas the STAI-C Trait consists of 20 items measuring how children "generally feel" (e.g., I lack self-confidence). Each item is rated on a 4-point scale, ranging from 1 (almost never), 2 (sometimes), 3 (often), to 4 (almost always). The items are summed to produce a total score with higher score indicating a higher degree of anxiety. The approval to use the STAI-C was obtained from the publisher - The Mind Garden Inc. Previous generalisation reliability of STAI-C in exploring anxiety among children has demonstrated high internal consistency (Cronbach's alpha, $\alpha=0.75$) [26]. Hashim and colleagues employed the STAI-C Malay-validated version to explore anxiety among children who visited hospitals for medical treatment. Internal consistency reliability for state and trait anxiety subscale was high with values of 0.94 and 0.84, respectively [27]. The present study used the STAI-C Malay-validated version. The instructions and the items were read by the researcher to the participants who cannot read on their own. A high internal consistency in trait anxiety (Cronbach's alpha, $\alpha=0.95$) and state anxiety (Cronbach's alpha, $\alpha=0.88$) was also demonstrated in the present study.

Art-Based Psychoeducation Module

Art-based psychoeducation module is a combination of psychoeducation with behavioural techniques such as relaxation, drawing and colouring activities could be effective in improving psychological functioning. Five medical and health experts that include occupational therapist (n=1), clinical (n=3), and special education teachers who works with children especially children with dyslexia (n=1) were appointed as panels to validate the content of the newly-developed art-based psychoeducation activities. Most of the experts agreed with the statement that the content of art-based psychoeducation module can improve psychological functioning of children with dyslexia which resulting the highest score validity coefficient of 0.92. The researchers finalised a module called art-based psychoeducation module with specific themes and activities distributed across 6 sessions. The session includes introduction, knowing your emotions, anxiety, relaxation, managing anger, and summary. These activities were arranged to be conducted once or twice every week with a minimum of 6 weeks to compete overall session of intervention. Upon validation processes, the researcher concluded that this intervention is to be conducted in 6 sessions twice a week, with a total of nine activities including coloring mandala, free drawing, coloring emotion, and relaxation techniques such as deep breathing, progressive muscle relaxation, and guided imagery relaxation within a duration of 40 to 45 minutes per session.

Procedures

Upon study approval obtained from the Human Ethics Committee Universiti Sains Malaysia and Ministry of Education Malaysia, the researcher approached the relevant authorities to enquire about the potential participants. Two main settings were identified namely the schools around Kelantan that offer the programme called "Program Integrasi Pendidikan Khas Masalah Pembelajaran - Disleksia" as well as the Rehabilitation Unit Hospital USM that provides occupational rehabilitation therapy for children diagnosed with dyslexia. Then, special education teachers and occupational therapists were contacted by the researcher, who helped to identify potential participants, as well as introduced the researcher to the children's parents. The researcher then personally approached potential participants to invite them to join the study. The purpose of the study was explained briefly, which was to evaluate the effectiveness of art-based psychoeducation activities in helping the children to better understand their emotions and cope with the situation concerning them.

Number of children with dyslexia within a one-year period was obtained from Rehabilitation Unit Hospital USM and selected primary schools that provide special education integration programmes in Kelantan. A total of 80 names were identified and assessed for eligibility to participate in this study. All of them were contacted and written information about the study was provided to encourage participation. The issue of confidentiality, voluntary participation, as well as the opportunity to withdraw at any time without jeopardising their right and benefit were explained. Thirteen cases (n=13) were excluded due to having comorbid conditions. Three parents (n=3) refused to participate in the study.

A total of 64 children were finally recruited and upon obtaining their signed consent, the STAI-C and PedsQL-VAS were given or read to the children to complete the pre-assessment. Purposive sampling was done to recruit the children with dyslexia to participated in this study. A total of 64 children with dyslexia agreed to participate in this intervention study. Thirty-three (n=33) children were enrolled in the intervention group to receive art-based psychoeducation intervention module. On the

other hand, 31 children enrolled in the control group. Following this, the study commenced with the children in the intervention group attending individual sessions of art-based psychoeducation activities consisting of 6 x 45 minutes sessions to be completed between 4 to 6 weeks, depending on the availability and feasibility of the children and their parents. All sessions were conducted by the first author, based on the guidelines stated in the developed manual. After 6 sessions of art-based psychoeducation, the STAI-C and PedsQL-VAS were re-administered on the children as post-assessment. Children in the control group were also subjected to post-assessment 6 weeks after the first assessment.

Ethical Clearance

The study protocol was approved by the Human Research Ethic Committee Universiti Sains Malaysia (USM/JEPeM/20080428) and the Ministry of Education (KPM.600-3/2/3-eras5557).

RESULTS

Socio-demographic Characteristics

Most of the children with dyslexia who participated in this study were boys, about 61% in both intervention and control groups. All children were Malay and the mean age for both groups was 10.1 (SD=1.58) years old. More than half of the children were registered for learning difficulties with the local social welfare department (90.9%, n=30) in the intervention group and (80.6%, n=25) in the control group. Regarding basic learning skills including arithmetic, writing, and reading, almost half of children in both groups were reported to perform poorly in all basic skills. Majority of children did not attend tuition or extra private classes. An overview of the demographic characteristics of the children and caregivers are presented in Table I, with no significant differences between the two groups.

Table I: Demographic characteristic of participants with dyslexia

Characteristics	Intervention group n=33	Control group n=31	*p-value*
	n= (%)	n= (%)	
Caregivers' Characteristics			
Mothers	19 (57.6)	21 (67.7)	
Fathers	11 (33.3)	9 (29.0)	
Others	3 (9.1)	1 (3.20)	
Age (Years) Mean (SD): 47.3 (8.26)	47.9 (8.94)	46.6 (7.57)	0.83
31-39	8 (24.2)	7 (22.6)	
40-49	14 (42.4)	14 (45.2)	
>50	11(33.3)	10 (32.3)	
Race			
Malay	33 (100)	31 (100)	
Education level			0.94
Not formal schooling	4 (12.1)	4 (12.9)	
Primary School	5 (15.2)	5 (16.1)	
Secondary	15 (45.5)	17 (54.8)	
Diploma	8 (24.2)	3 (9.70)	
Bachelor's degree or above	1 (3.0)	2 (6.50)	
Monthly Household Income (in Malaysia Ringgit) Mean (SD) 2837.1 (1477.4)	2820.6 (1600.9)	2854.8 (1360.1)	0.95
<1000	6 18.2)	3 (9.70)	
1001-3000	17 (51.5)	17 (54.8)	
3001-5000	8 (24.2)	9 (29.0)	
>5000	2 (6.1)	2 (6.50)	
Children's Characteristics			
Gender			0.91
Boy	20 (60.6)	19 (61.3)	
Girl	13 (39.4)	12 (38.7)	
Age (Years) Mean (SD): 10.1(1.58)	10.4 (1.48)	9.71 (1.61)	0.55
7	1 (3.00)	3 (9.70)	
8	4 (12.1)	5 (16.1)	
9	2 (6.10)	6 (19.4)	

CONTINUE

Table I: Demographic characteristic of participants with dyslexia (CONT.)

Characteristics	Intervention group n=33	Control group n=31	*p-value*
	n= (%)	n= (%)	
Age (Years) Mean (SD): 10.1(1.58)	10.4 (1.48)	9.71 (1.61)	0.55
10	8 (24.2)	7 (22.6)	
11	7 (21.2)	4 (12.9)	
12	11 (33.3)	6 (19.4)	
Registered with Social Welfare			
Yes	30 (90.9)	25 (80.6)	0.18
No	3 (9.10)	6 (19.4)	
Attending Academic Tuition			
Yes	3 (9.10)	13 (41.9)	0.001
No	30 (90.9)	18 (58.1)	
Current Learning Status Activity			0.20
Active	7 (21.2)	7 (22.6)	
Less Active	15 (45.5)	18 (58.1)	
Not active	11 (33.3)	6 (19.4)	
Current Academic Performance			
Arithmetic			0.19
Excellent	4 (12.1)	9 (29.0)	
Satisfactory	10 (30.3)	17 (54.8)	
Poor	19 (57.6)	5 (16.1)	
Writing			0.44
Excellent	4 (12.1)	2 (6.50)	
Satisfactory	12 (36.4)	21 (67.7)	
Poor	17 (51.5)	8 (25.8)	
Reading			0.12
Excellent	3 (9.10)	2 (6.50)	
Satisfactory	13 (39.4)	16 (51.6)	
Poor	17 (51.5)	13 (41.9)	

First, the effects of art-based psychoeducation on children's overall psychological functioning were measured using PedsQL-VAS as reported by the children at pre- and post-assessment. Children in the control group were also subjected to PedQL-VAS assessment at both phases. The total symptoms score of the scale combined the anxiety, sadness, anger, worry, tiredness, and pain scores. Whilst the total emotional distress are the total scores of anxiety, sadness, anger, and worry. The Repeated Measures (RM) ANOVA were conducted for total symptoms score, emotional distress score, and each individual symptoms to compare the scores between intervention and control group at pre-and post-assessment. Table II shows the means and standard deviations for total symptoms, total emotional distress, and each symptom, as well as the between group effects. The main effect comparing the intervention and control group over pre- and post-assessment level was significant, suggesting the art-based psychoeducation module was effective in reducing the total symptoms scores among children with dyslexia [$F(1,62) = 5.59$, $p < 0.02$]. There was a substantial major effect for time in the intervention group [Wilks' Lambda = 0.42, $F(1,62) = 83.2$, $p < 0.001$). There was significant interaction between the group conditions and time [Wilks' Lambda = 0.63, $F(1,62) = 37.2$, $p<0.001$]. There are decreases in score at post-assessment in intervention group compared to control group. The mean of total emotional distress score at pre-assessment in intervention group was 48.7 (SD=19.6) and post-assessment was 14.5 (SD=8.11). The mean of control group was 39.7 (SD=21.2) at pre-assessment and post-assessment was 41.6 (SD=18.2). The main effect comparing the intervention and control group over pre- and post-assessment level was significant, [$F(1,62) = 5.22$, $p<0.05$]. It is suggested that children in intervention group report significantly lower in total emotional distress score after receiving intervention program as compared to control group.

Table II: Mean, Standard Deviations, Effects Size, Group Effects, Time Effects and Group X Time Effects for PedsQL-VAS Present Functioning in Intervention and Control Groups at Pre- and Post-Assessment Levels.

Variable	Treatment condition				F group	F time	FG X T	ES[1]
	Intervention n=33		Control n=31					
	Pre-Mean (SD)	Post-Mean (SD)	Pre-Mean (SD)	Post-Mean (SD)				
Total symptoms Score of VAS	39.3 (18.2)	11.4 (6.07)	36.1 (20.3)	30.5 (12.7)	5.59*	83.2***	37.2***	0.37
Total Emotional Distress	48.7 (19.6)	14.5 (8.11)	39.7 (21.2)	41.6 (18.2)	5.22*	74.8***	93.8***	0.60
Anxiety	55.7 (27.8)	8.48 (6.67)	41.9 (29.4)	42.2 (21.2)	3.97*	67.5***	69.3***	0.52
Sadness	44.5 (34.2)	13.6 (13.8)	38.7 (29.7)	40.6 (27.5)	3.02	21.1***	27.1***	0.30
Anger	36.9 (23.6)	14.2 (14.1)	37.4 (28.0)	36.7 (23.8)	5.07*	20.1***	18.0***	0.22
Worry	57.8 (24.9)	21.8 (12.6)	40.9 (30.0)	47.0 (23.5)	0.71	21.6***	43.1***	0.41
Tiredness	24.5 (29.1)	8.48 (13.4)	32.9 (31.5)	11.6 (8.98)	1.71	25.3***	0.49	0.01
Pain	16.3 (28.0)	2.12 (7.39)	24.8 (29.1)	5.16 (5.69)	2.02	27.2***	0.69	0.01

PedsQL-VAS = PedsQL Present Functioning Visual Analogue Scale; SD = Standard Deviation; Group = Effect of Condition (Intervention versus Control); Time = Effect of Time; G x T = Interaction between Condition and Time; ES[1] = Effect Size (Post-Assessment Means in Intervention vs Control); * p <.05; **p<.01; ***p <.001.

Table III shows the effects of the intervention on children's state and trait anxiety, the Repeated Measures ANOVA was performed. The mean of state anxiety score at pre-assessment in the intervention group was 43.0 (SD=4.54) and at post-assessment was 38.1 (SD=3.64). For the control group, the mean of state anxiety score at pre-assessment was 42.7 (SD=7.41) and at post-assessment was 42.8 (SD=2.35). The main effect comparing the intervention and control groups over pre- and post-assessment level was statistically significant, suggesting the art-based psychoeducation intervention was effective in reducing the present level of anxiety among children with dyslexia [F (1,62) = 6.76, p<0.01]. There was a significant major effect for time, with the intervention group showing reduction in state anxiety score compared to control groups [Wilk's Lambda = 0.88 F (1,62) = 7.83, p<0.01]. To assess the effects of the intervention on the trait anxiety score, another Repeated Measures ANOVA was performed. The mean for trait anxiety at pre-assessment in the intervention group was 40.1 (SD=5.33), and at post-assessment was 34.4 (SD=4.06). For the control group, the mean of trait anxiety at pre-assessment was 41.3 (SD=10.4) and at post-assessment was 38.3 (SD=6.55). The result of trait-anxiety revealed nonsignificant main effects, although there was a trend towards the reduction of anxiety following intervention [F (1,62) = 3.04, p=0.08]. The intervention resulted in a moderate effect in reducing trait anxiety among the participants. There was a significant effect for time, suggesting that the intervention group showed a reduction in trait anxiety after 6 intervention sessions [Wilk's Lambda = 0.74, F (1,62) = 21.4, p<0.001]. There was no significant interaction between the group condition and time [Wilk's Lambda = 0.96, F (1,62) = 2.06, p<0.15]. Table III shows the means and standard deviations of the state and trait anxiety, as well as the between group effects i.e., condition (intervention, control), within group effects i.e., time (pre-and post-assessment), and Condition x Time effects between the intervention and control group.

Table III: Mean, Standard Deviations, Effects Size, Group Effects, Time Effects and Group X Time Effects for State-Trait Anxiety Inventory in Intervention and Control Groups at Pre- and Post-Assessment Levels.

Variable	Treatment condition				F group	F time	FG X T	ES[1]
	Intervention n=33		Control n=31					
	Pre-Mean (SD)	Post-Mean (SD)	Pre-Mean (SD)	Post-Mean (SD)				
STAI-C State	43.0 (4.54)	38.1 (3.64)	42.7 (7.41)	42.8 (2.35)	6.76**	7.83**	8.04**	0.11
STAI-C Trait	40.1 (5.33)	34.4 (4.06)	41.3 (10.4)	38.3 (6.55)	3.04	21.4***	2.06	0.32

STAI-C/ State or Trait = State-Trait Anxiety Inventory for Children; SD = Standard Deviation; Group = Effect of Condition (Intervention versus Control); Time = Effect of Time; G x T = Interaction between Condition and Time; ES[1] = Effect Size (Post-Assessment Means in Intervention vs Control; * p <.05; **p<.01; ***p <.001.

In addition to examine the effects of the overall art-based psychoeducation module on the children's emotional functioning, the current study explored the effects of particular activity, which are free drawing and mandala colouring, in reducing four basic emotional difficulties – anxiety, sadness, anger, and worry. The effects of these two art-based activities on children's emotion were measured separately using the same scale PedsQL-VAS as reported by children soon after they completed the free drawing and mandala colouring activities. The paired sample t-test was conducted for each emotional outcome to compare the mean scores at pre-assessment (T1) after free drawing activities (T2). The results demonstrates that there was statistically significant decrease in anxiety score after free drawing activity (Mean = 18.7; SD =28.6), t(32) = 7.49, p<0.001). For sadness score, it was also significantly decreases after the children with dyslexia completed the free drawing

activity (Mean = 16.9; SD =28.8), t(32) = 5.00, p<0.001. Similarly, the test showed a significantly reduced level of anger and worry after free drawing (Mean = 17.5; SD =27.1), t(32) = 3.22, p=0.003 and . (Mean = 19.3; SD =24,7), t(32) = 7.26, p<0.001, respectively. The means, standard deviations, t-scores, and p-values are presented in Table IV.

Table IV: Paired sample t-test results on PedsQL-VAS-total emotional distress after free drawing in intervention group.

Variable	Treatment condition			t(32)	*p-value*
		Intervention n=33			
		Mean	SD		
Emotional Distress					
Anxiety	T1	55.7	27.8	7.49	0.001***
	T2	18.7	28.6		
Sadness	T1	44.5	34.2	5.00	0.001***
	T2	16.9	28.8		
Anger	T1	36.9	23.6	3.22	0.003**
	T2	17.5	27.1		
Worry	T1	57.8	24.9	7.26	0.001***
	T2	19.3	24.7		

T1= Pre—assessment; T2-After free drawing. * p <.05; **p<.01; ***p <.001.

The results from paired sample t-test comparing mean differences after free drawing and immediately after mandala colouring were obtained. The data demonstrates that there was statistically significant decrease in all scores of emotional distress after mandala colouring. The anxiety score after mandala colouring was significantly decreased (Mean = 2.42; SD =5.01), t(32) = 3.55, p<0.001. Similarly, the sadness and anger scores were also significantly reduced, (Mean = 2.12; SD =4.84), t(32) = 3.23, p<0.01, and (Mean = 1.81; SD =4.64), t(32) = 3.49, p<0.001 respectively. Finally, the children in the intervention group reported significantly lower level of worry immediately after mandala colouring, as compared to the initial scores obtained after they completed the free drawing (Mean = 2.12; SD =4.25), t(32) = 4.08, p<0.001. The means, standard deviations, t-scores, and p-values are presented in Table 5.

Table V: Paired sample t-test results on PedsQL-VAS-total emotional distress after colouring mandala in intervention group

Variable	Intervention n=33			t(32)	p-value
		Mean	SD		
Emotional Distress					
Anxiety	T2	18.7	28.6	3.55	0.001***
	T3	2.42	5.01		
Sadness	T2	16.9	28.8	3.23	0.003**
	T3	2.12	4.84		
Anger	T2	17.5	27.1	3.49	0.001***
	T3	1.81	4.64		
Worry	T2	19.3	24.7	4.08	0.001***
	T3	2.12	4.15		

T1= Pre—assessment; T3-After coloring mandala. * p <.05; **p<.01; ***p <.001.

DISCUSSION

The current study examined the effects of art-based psychoeducation module in improving psychological functioning among children with dyslexia. Based on pre-assessment scoring, high scores were reported by the majority of the children in all components of negative emotion especially state anxiety and worry symptoms. This finding was somehow expected because at pre-assessment, all the children were subjected to respond to a set of 'written questionnaires' which they may perceive as threatening. Caroll and Iles stated that children with dyslexia tend to be more anxious in a situation which involves academic-related activities such as writing and reading [28]. Negative emotions in children with dyslexia tend to increase when they are in specific events, or tasks that usually require more reading or spelling activities which can trigger the negative thoughts of inability to perform well [15].

The results from the present study supported the effectiveness of art-based psychoeducation module which contributes to decreased negative emotion. Psychoeducation is an essential component in this current module where the children learn about emotion. Wilmot and colleagues highlighted that children with dyslexia may have difficulty to understand their own emotions. In general, teaching children about emotional development and coping are important, as it involves gaining knowledge about emotion, understanding how and why they happen [29]. According to Petermann and Wiedebusch, children experience the basic emotions of

joy, fear, anger, sadness, surprise, and interest during their first year of life. Towards the conclusion of the second year of life, more advanced self-referential emotions like pride, shame, compassion, envy, embarrassment, and guilt [30]. To feel these emotions, a child needs to be aware of and capable of implementing socially acceptable behaviour standards in their own behaviour [31]. Our module includes activities on knowing emotions through different activities. For example, children get to identify their positive and negative emotions through the coloring of a series of pictures representing different faces of basic emotions, such as sadness, anger, fear and so on. There is evidence to suggest that understanding emotions is good for children to live healthier and better. According to LoBue and Ogren, understanding emotions enables us to anticipate social interactions, respond to people's needs properly, and even control our own emotions [32]. Similarly, Thьmmler and colleagues found that children who can identify their own emotions, understand, and learn how to manage their emotions are better in regulating their own emotions [33]. The ability to regulate emotion would then affect how they manage their emotions, respond to the events that happen around them, and interact with others [34]. Malik and Marwaha study on social emotional development among children suggested that emotional skills are correlated with ability to properly express emotion such as sadness, anxiety, fear, anger, and happiness [35].

This study indicated significant differences in the score of emotional distress immediately after drawing activity among children with dyslexia in the intervention group. Past studies supported that integrating drawing into class lessons may improve learning skills for children with dyslexia. For instance, Ainsworth and Scheiter stated that drawing can play an important role in education, improve engagement, and communication skills [36]. This explains how the current art-based psychoeducation activities can provide harmonious and appropriate activities for children with dyslexia to release their negative emotion and enhance their psychological functioning. In addition, significant differences in the score of emotional distress were also evident immediately after mandala colouring among children with dyslexia in the intervention group. This finding is in line with Curry and Kasser who reported that levels of anxiety among students decreases after colouring mandala as compared to students who did unstructured colouring [37]. Mandala colouring appears to be an effective intervention activity incorporated in this current module. Among the objectives of colouring mandala are to enable the individuals to spend quiet time focusing on a single task, without disruption, and eventually to deal and resolve the emotional issues as they may emerge, in a meditative state. Kim and colleagues concluded that mandala colouring is an effective technique for therapeutic purposes [38]. This recent study used the basic pattern of mandala, and children were requested to fill all the petals of the flowers and the circles with any colour that they like. This is consistent with Ashlock and colleagues who emphasized that having structured mandala patterns to be coloured might induce a meditative state that benefits individuals suffering from anxiety [39]. On the same token, Babouchkina and Robbins who examined the creation of mandala suggested that it has specific efficacy for reducing negative mood states. They suggested that the circular shape of the mandala serves as an "active component" in mood improvement [40].

In addition, several relaxation techniques have been taught and practiced in the session with the children to alleviate the negative emotions, especially anxiety. Specifically, deep breathing, progressive muscle relaxation, and guided imagery have been shown in this study to effectively decrease anxiety levels in children with dyslexia, who always have problems relaxing during anxiety-provoking situations. The benefit of deep breathing in this study is consistent with Kurth and colleagues, who reported deep breathing as one of the interventions to help children relax quickly when facing stressful situations [41]. Furthermore, Toussaint and colleagues noted that deep breathing is a significant technique to reduce state anxiety [42]. Through training, children with dyslexia will automatically slow down their breathing, bringing more oxygen into their bodies and helping them to relax [43]. Our findings revealed similar results as Jarraya and colleagues where they found that 30- minutes of PMR was effective in enhancing attention among children aged 5 to 7 years old [44]. PMR as part of the home programme for children with learning difficulties and checked its efficacy [45]. Similarly, Spohn and Egeler who introduced PMR in special schools for learning difficulties students have concluded that PMR technique is quite feasible in the school context and relaxation in special schools for children with special educational needs are to be considered [46].

Another relaxation technique we applied in the module to help the children with dyslexia to achieve a relaxed state and regulate their emotion is Guided Imagery and Relaxation (GIR). During the GIR session, children were "guided" into a story and encouraged to use their imagination and visualization to put themselves in the situation described in the story [47], so that a calming and relaxing state is achieved. In this current intervention, a 5-minutes audio of GIR script was played to be listened by the children to promote peaceful and healing experiences, feeling of reliant to the Almighty, and to subsequently gain positive motivation and strength [25]. This audio has proven to be a valid and reliable tool which helps to reduce negative emotions and increase psychological well-being in general, among Malaysian children at the hospital setting [25]. Many researchers have concluded that relaxation with imagery is more effective to improve mood states [48]. Harpazi and colleagues extended the idea that as the children with

dyslexia can complete this intervention well, thus it can be assumed that they have improved their self-confidence and self-esteem with guided imagery relaxation [49]. Our results lend support that three types of relaxation such as deep breathing, progressive muscle relaxation and guided imagery technique we offered are effective in improving the mood of children with dyslexia.

Although dyslexia presents major challenges for the individuals affected by it, the condition can be managed with early identification, support and educational as well as psychological interventions. As the timing of a child's diagnosis is dependent on parental and teachers' knowledge and awareness, more efforts should be directed to increase parents' and teachers' understanding and reduce the stigma associated with dyslexia.

CONCLUSION

In conclusion, the current study found that children with dyslexia reported reduced emotional distress after joining the art-based psychoeducation module, as compared to the control group. There were statistically significant differences in scores of anxiety, sadness, worry and anger, pre- and post-assessment, in the intervention group, compared to the control group. The combination of activities and techniques in the current intervention have positive effects on reducing emotional distress, and children's overall emotions have been greatly improved. This study provides positive opportunities for children with dyslexia to engage with their inner emotions or feelings through intervention activities. Highlighting this combination of activities can serve as a positive example, encouraging other children to enhance their psychological well-being.

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