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The art therapy significance in decreasing psychological manifestations to autistic children; A cross-sectional study

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Abstract

A novel instrument was created and subsequently evaluated to enhance the assessment of treatment outcomes within the domain of art therapy (AT) for children diagnosed with autism spectrum disorders (ASD). The scale employed in this research is the OAT-A (Observation in Art Therapy with a Child diagnosed with autism spectrum disorder instrument, which underwent a three-stage refinement process. Throughout each iteration, individuals responsible for assessing the efficacy of art therapy, such as art therapists and students, were provided with and examined four separate videos showcasing different art therapy sessions. The assessment of interrater reliability was conducted for each round, and necessary revisions were made to the items. In each iteration, the initial video was solely utilized for training objectives. During the third round, both instruments exhibited a satisfactory level of intercoder agreement. In order to effectively employ the OAT-A in clinical research, it is imperative to provide extensive training to raters. Ideally, this training should be conducted in a collaborative environment, which would enhance the ability to compare and evaluate their assessments. The current study posits that substantial efforts have been made to enable a systematic evaluation of art therapy in children with autism spectrum disorder (ASD), including the interventions conducted by the art therapist.

Keywords:

Autism Spectrum Disorders, Art therapy, OAT-A.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that primarily affects children. It is characterized by impairments in social interaction, communication, and behaviour [1, 2], as well as the presence of restricted and repetitive patterns of interests and activities. Individuals who have received a diagnosis of Autism Spectrum Disorder (ASD) often demonstrate inflexible behavioural patterns and face challenges in processing sensory information, such as experiencing tactile defensiveness [3]. Art therapy interventions are employed to facilitate the improvement of clients' sensory processing, behaviour, and interaction abilities. Art therapists commonly utilize a range of interventions for individuals diagnosed with Autism Spectrum Disorder (ASD) [4]. These interventions encompass sensory-based or behavioural approaches, social cognitive training, developmental skills interventions, interactive training [5, 6], and parent-mediated strategies [7]. The concept of art is distinguished by its inherent breadth, as it encompasses a diverse array of activities [8]. It was reported that creative arts occupations encompass arts-related tasks that serve to stimulate an individual's creative capacities [9].The spectrum of artistic expressions encompasses a diverse array of mediums, including but not limited to painting, drawing, creative writing, music [10], and textile arts and crafts. A framework of creative arts occupations to establish a definition of the concept of art[11]. Previously, it was examined the frequency of use of specific creative arts in the field of occupational art therapy and their potential

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effectiveness in promoting positive outcomes for children with Autism Spectrum Disorder (ASD) [12]. Numerous studies have provided evidence indicating that participation in creative arts endeavours can result in advantageous effects on the performance abilities of individuals diagnosed with Autism Spectrum Disorder (ASD) [13, 14].

Children who have been diagnosed with Autism Spectrum Disorder (ASD) often face difficulties in their capacity to communicate and participate in social interactions with both their peers and adults [15]. The artistic practice of drawing or painting allows individuals to express their thoughts and emotions [16], while also facilitating a mode of communication that is indirect and implicit, thus enabling interaction with others. Despite the abundance of existing research on the topic of art interventions in the context of Autism Spectrum Disorder (ASD) interventions [17], there is a noticeable deficiency in the literature concerning the methodical investigation of how occupational therapists utilize different art interventions when working with children who have been diagnosed with ASD [18]. Although there is a scarcity of relevant evidence, occupational therapists possess the requisite expertise to integrate art into therapy in order to facilitate the integration of sensory processing and behavioural capabilities [19].

Numerous studies have provided evidence regarding the effectiveness of creative arts interventions in mitigating behavioural, social, and developmental difficulties in children who have received a diagnosis of Autism Spectrum Disorder (ASD) [20, 21]. The creative arts provide children diagnosed with Autism Spectrum Disorder (ASD) with a means of self-expression through diverse artistic mediums, while simultaneously cultivating a safe space for communication and the enhancement of skills [22, 23]. Art as Occupational therapists demonstrates a significant level of appropriateness in utilizing creative arts interventions as a therapeutic modality for children who have received a diagnosis of Autism Spectrum Disorder (ASD) [24].

The incorporation of different artistic modalities can provide a wide range of sensory experiences, encompassing auditory and tactile perceptions, while effectively capturing the manifestations of depression and anxiety. Art activities possess a unique attribute that holds promise in offering benefits to individuals grappling with difficulties pertaining to sensory processing and emotional regulation, commonly encountered among children diagnosed with Autism Spectrum Disorder (ASD) [25, 26]. For example, the incorporation of visual aids and tangible materials, such as pictures, has been found to facilitate the integration of sensory and cognitive experiences in children with Autism Spectrum Disorder (ASD) [27], thus fostering behavioural changes. However, there is currently a lack of certainty regarding the effectiveness of art activities in improving outcomes related to occupation[28]. Therefore, it is important to incorporate empirical research when utilizing creative arts interventions for children who have been diagnosed with Autism Spectrum Disorder (ASD). Therefore, the aim of this study is to assess the effectiveness of art therapy in reducing psychological symptoms among autistic children [29, 30].

Methods

The OAT-A has undergone development and testing using a mixed methods design. The collection of quantitative data involved an examination of the items in both instruments, utilizing a 5-point Likert rating scale to assess the frequency of observed behaviour (ranging from 1, indicating never observed, to 5, indicating very frequently observed) and the visibility of behaviour (ranging from 1, indicating very unclear, to 5, indicating very clear). The qualitative data encompassed both verbal and written remarks provided by the participants.

Participants

A convenience sampling technique was utilized to enlist a total of 73 participants, comprising both therapists and students. This entailed employing newsletters disseminated by professional organizations, leveraging the reach of Facebook, and relying on word-of-mouth advertising. The study included 48 art therapists who possessed a Bachelor of Arts (BA) certification, which adhered to the national standard for practicing the art therapy profession in the Netherlands, where this research was conducted. Among the participants in this specific cohort, a significant majority (n = 44) demonstrated considerable expertise in the field of therapy, particularly in working with children diagnosed with Autism Spectrum Disorder (ASD). The study's participant sample comprised 25 students who were not required to have prior experience as art therapists. The inclusion of individuals would be dependent on their demonstrated proficiency in observing clients' behaviour within the context of assistive technology (AT). Throughout numerous iterations. In each iteration, separate cohorts were established, consisting of a maximum of ten individuals, with the aim of promoting information exchange and encouraging discussions.

Instrument

The measurement instrument consists of four distinct subscales that evaluate discernible alterations in children's behaviour, with a specific focus on self-perception, emotional regulation, adaptability, and social interactions. The aforementioned modifications are expected to become evident when the child is

exposed to suitable stimuli. Furthermore, the aforementioned behaviours have been recognized as noteworthy problematic domains in children who have received a diagnosis of autism. The following elucidations of the subscales can be provided.

Sense of Self

The OAT-A subscale consists of seven items that pertain to the process of creating art. As an illustration, consider item 1.2: The child demonstrates a heightened level of sensitivity when engaging with art materials.

Emotion regulation

The subscale in question comprises three items within the OAT-A, with item 2.1 serving as an illustrative example. The child exhibits emotional responses and undergoes the process of experiencing them.

Flexibility

Within the OAT-A, this particular subscale is comprised of three individual items. For instance, one of these items is labelled as 3.2. The child employs a diverse range of art materials and/or techniques.

Social behaviour

The subscale in question consists of a total of nine items as indicated in the OAT-A. One such item is item 4.3. The child adheres to the instructions provided by the art therapist.

Procedure

The instrument employed in this study was formulated using a compilation of 46 elements that were identified through consensus [6]. Subsequently, these elements were reformulated into discrete entities that precisely delineate discernible actions. Any elements that were not directly associated with observable behaviour, such as the equipment found within the art therapy room, were excluded. Among the items that displayed notable overlap, only one was ultimately included in the list.

In specific cases, it was deemed essential to restructure a component into two distinct statements to augment its observability. The decision to choose the four domains of outcomes (specifically, sense of self, emotion regulation, flexibility, and social behaviour) was made with the intention of organizing and classifying the items within the subscales. The final 22 items of the OAT-A were obtained through a rigorous three-round testing procedure, which encompassed the process of testing and refining.

To evaluate the interrater reliability of both instruments, four distinct video segments of Art Therapy (AT) sessions with children diagnosed with autism spectrum disorder (ASD) were employed. These video segments were used to assess the level of agreement among raters regarding the OAT-A. The videos portrayed four discrete occurrences in which art therapists engaged with children diagnosed with autism spectrum disorder (ASD). The research materials for this study were created in the form of videos by art therapists who are associated with various organizations within the country. These therapists were invited to participate in the study through different channels, including newsletters and word-of-mouth referrals [31, 32]. The aim of this study was to produce a video compilation showcasing art therapy sessions conducted with children aged 6 to 12 who have received a diagnosis of autism spectrum disorder (ASD). The focus was not limited to any particular art therapeutic approach utilized during these sessions. The childcare organizations issued an official consent declaration regarding the creation and use of a video for educational objectives. The process of selecting the final video fragments has been carried out in accordance with the criteria established by Harinck and Hellendoorn in 1987 [33].

The provided excerpts portray sessions that took place within an Art Therapy (AT) setting involving a child who has received a diagnosis of autism spectrum disorder (ASD). The video recording exhibits a clear depiction of the child engaging with the art materials. The portrayal of the art therapist's actions and interactions, including nonverbal communication with the child, is evident. The collected excerpts encompass multiple phases of the therapeutic intervention, encompassing the initiation, progression, and culmination of the Art Therapy sessions. - The presence of these fragments enables observers to evaluate and assign ratings to all the items on both scales[34].

The selection of videos was conducted with meticulous attention to the diverse factors of age, gender, and specific challenges encountered by children who have received a diagnosis of autism spectrum disorder (ASD). Children can display a range of intellectual abilities, which can vary from average to above average[35, 36].

The first two rounds were carried out with the objective of improving and assessing the scales, with the aim of facilitating the creation of a definitive measurement in the subsequent third round. During the third round of evaluation, it was concluded that no additional modifications were necessary. The individuals who had previously evaluated the initial video perceived the items as adequately comprehensible. As a consequence of the time constraints imposed by the exercise video, it was not always possible to watch video 4, leading to its exclusion in round three[37].

Data analysis

The qualitative data encompassed participants' comments and discussions pertaining to the recognition and interpretation of the items. The items were modified based on the feedback and observations provided by the participants, as well as the notes taken during the

discussions by the primary researcher (first author). The determination was made that the items had achieved sufficient clarity, as evidenced by the absence of any additional comments. The level of saturation observed during the third round was consistent with the findings reported by Baarda et al. [38].

The computation of interrater reliability is conducted using two methods: on a per-item basis and on a per-subscale basis. The quadratic weighted Kappas (κw) were used to calculate the degree of agreement between all pairs of raters for each item, due to the ordinal level of the scores on the 5-point Likert scale. The κw coefficient may be subject to the influence of a constraint on the range of scores, leading to an exaggerated high or low value. Hence, Gower indices (G) were calculated to facilitate the interpretation of κw values for items exhibiting either extremely high or extremely low levels of absolute agreement [39, 40].

Results

Comments

In light of the comments regarding descriptions and evaluations. A notable observation made by professionals and students engaged in the study of assistive technology (AT) was their unanimous assessment of the significant advantages offered by both scales when used to observe AT sessions involving children diagnosed with autism spectrum disorder (ASD). The professionals recognized the items and observed a heightened awareness of their treatment approach. Furthermore, it was observed that the professionals experienced a feeling of "relief" when they discovered that the items closely resembled their own experiences. The utilization of scales in the research additionally played a role in augmenting their self-assurance. According to the students' feedback, the utilization of the items contributed to a heightened understanding of the art therapy scenario pertaining to a child who has been diagnosed with autism spectrum disorder (ASD). Throughout the course of discussions pertaining to the interpretations of items, a comprehensive written explanation was developed for each item within both scales. The participants recognized the importance of offering an explanation to avoid any potential misinterpretation of the items and to enhance their understanding of the practical application of the scales. The length of rating sessions demonstrated a decline as participants gained greater familiarity with the items. In the first round, the participants required an average of 30 minutes to assess the instrument, whereas in the following round, this duration decreased to approximately 15 minutes.

Interrater reliability

The subsequent table presents the interrater reliability scores pertaining to the third iteration of the OAT-A. The following table displays the results for the four subscales. The determination of agreement levels for each subscale involved the calculation of means for the relevant item κw values.

The degree of consensus pertaining to the four subscales of both measures, specifically sense of self, emotion regulation, flexibility, and social behavior, primarily spans from moderate to significant. Nevertheless, there exist a limited number of cases in which the level of agreement is subpar. The agreement pertaining to the individual components of both instruments demonstrates a spectrum of reliability, ranging from "low reliability" to "nearly perfect reliability." The scores of the three videos subscale 1, which measures the sense of self, in video 2 demonstrates a noteworthy degree of concurrence between students and professionals.

To optimize the results, the agreement scores were computed by transforming the original 5-point Likert scale into a 3-point Likert rating scale (specifically, 1–2/3/4–5). Consequently, there was a notable rise in demonstrate variability in both the uppermost and lowermost values across all subscales and items. Nevertheless, no identifiable patterns were detected that would indicate the existence of notably deficient items or subscales.

The ratings assigned to video 1 by the individuals who underwent training demonstrate a higher degree of consensus. The initial subscale, particularly the component pertaining to an individual's self-perception, exhibits the greatest degree of agreement.

The levels of agreement among professionals in the OAT-A are suggestive of a below-average level of consensus. This concerns the scores obtained by art therapists on subscale 2, which measures emotion regulation, and subscale 3, which assesses flexibility, in video 3. These scores are applicable to both instruments. The OAT-A demonstrated a predominance of items that received a 'substantial' rating, with a small number of items being evaluated as 'almost perfect', 'moderate', or 'poor'. After conducting a more thorough analysis of the data, it became apparent that there were noticeable differences between the individuals categorized as experts and those categorized as students. After analyzing the average subscale scores obtained from the OAT-A, it becomes apparent that the student's scores demonstrate a significantly higher degree of consensus in comparison to the scores of the art therapists. Within the range of video subscales, it is evident that solely subscale 3, which pertains to the attribute of flexibility, demonstrates a resemblance in the average scores between students and professionals. Only two subscale scores demonstrate a lower value. Video 3 analyzed two distinct subscales, namely subscale 1, which is associated with the concept of self-identity, and subscale 2, which centers around the process of regulating emotions. The

findings derived from the levels of relative agreement (G), which were omitted from the findings section. The inter coder agreement of the OAT-A was found to be high, with values ranging from 0.74 to 1.00. Precisely, 42% of the agreement was categorized as 'moderate', whereas 58% was categorized as 'good and nearly perfect'

Table 1: The concept of interrater reliability refers to the degree of agreement or consistency between multiple raters or observers when assessing or evaluating the OAT-A. The study conducted three rounds of video observations on a sample of 29 Art Therapists (AT) and 18 Art Therapy students (ST). The analysis included individual weighted Kappas (Kw) and Gowers (G) scores, as well as subscale means and the minimum to maximum range, expressed as a percentage (* 100), for the weighted Kappas.

1	Sense of self Self-perception – Self-image – Self esteem	Video 1				Video 2				Video 3			
		K_w		G		K_w		G		K_w		G	
		AT	ST	ST	AT	AT	ST	AT	ST	AT	ST	AT	ST
1.1	Child moves in relaxed manner in the room of art therapy	0.74	0.72	0.62	0.65	0.63	0.71	0.51	0.73	0.62	0.71	0.62	0.56
1.2	Child shows high sensitivity when catching materials	0.72	0.61	0.72	0.55	0.33	0.61	0.49	0.83	0.62	0.41	0.32	0.36
1.3	Child can be connected to his experiences in the art making film	0.64	0.71	0.72	0.55	0.63	0.49	0.51	0.83	0.62	0.71	0.52	0.46
1.4	Child can direct the attention with his own art	04	0.72	0.52	0.65	0.63	0.81	0.51	0.73	0.32	0.71	0.62	0.51
1.5	Child can show an experience for success	0.62	0.11	0.52	0.35	0.33	0.61	0.71	0.83	0.22	0.49	0.32	0.46
1.6	Child makes a connection with his experiences in the art making film and in whole daily life	0.64	0.42	0.42	0.55	0.53	0.71	0.51	0.33	0.12	0.9	0.12	0.16
1.7	Child has an awareness to his behavior and manner through the made art	0.74	0.52	0.42	0.65	0.33	0.51	0.51	0.53	0.16	0.71	0.62	0.67
Subscale mean (min – max)x 100		0.62	0.62			0.42	0.64			0.45	0.47		
2	Emotion Regulation												
2.1	Child shows emotions	0.4	0.51	0.91	0.71	0.56	0.4	0.31	0.45	0.61	0.78	0.9	0.52
2.2	Child can express his emotions with the materials of art	0.62	0.51	0.42	0.35	0.33	0.61	0.71	0.83	0.52	0.49	0.42	0.36
2.3	Child can independently makes his art as work	0.44	0.71	0.62	0.35	0.63	0.49	0.81	0.83	0.52	0.71	0.42	0.66
Subscale mean		0.52	0.7			0.45	0.63			0.36	0.51		
3	Flexibility												
3.1	Child can react with any tense	0.74	0.32	0.42	0.65	0.63	0.51	0.51	0.73	0.62	0.71	0.62	0.56
3.2	Child can use a different and varied art materials for his making art	0.62	0.81	0.72	0.35	0.33	0.61	0.71	0.83	0.72	0.49	0.32	0.46
3.3	Child can show an authenticity during art making	0.81	0.52	0.67	0.61	0.5	0.43	0.21	0.56	0.73	0.98	0.8	0.31

Subscale mean		0.59	0.59			0.46	0.55			0.39	0.66		
4	**Social**												
4.1	**Child can mirror his body language from the therapist**	0.62	0.81	0.52	0.35	0.33	0.61	0.71	0.83	0.22	0.49	0.32	0.46
4.2	**Child can show enjoying during art making with his sharers**	0.74	0.42	0.42	0.55	0.43	0.71	0.51	0.33	0.62	0.59	0.62	0.16
4.3	**Child can follow the therapist directions**	0.74	0.52	0.42	0.65	0.33	0.51	0.51	0.53	0.16	0.71	0.62	0.67
4.4	**Child accepts any therapist help**	0.62	0.81	0.72	0.35	0.33	0.61	0.71	0.83	0.22	0.49	0.32	0.46
4.5	**Child can make his work with sharing attention**	0.74	0.42	0.42	0.55	0.33	0.71	0.51	0.73	0.62	0.33	0.62	0.16
4.6	**Child can make his work with an interaction**	0.62	0.61	0.72	0.35	0.33	0.41	0.71	0.83	0.42	0.49	0.32	0.36
4.7	**Child can ask for help from therapist**	0.64	0.71	0.72	0.35	0.63	0.49	0.91	0.83	0.62	0.71	0.32	0.66
4.8	**Child makes his art in reciprocal with the art**	0.62	0.65	0.72	0.35	0.33	0.31	0.14	0.83	0.22	0.32	0.32	0.46
4.9	**Child makes a perfect eye contact**	0.17	0.42	0.78	0.55	0.33	0.41	0.51	0.56	0.62	0.41	0.41	0.16
Subscale mean		0.47	0.56			0.45	0.58			0.47	0.5		

Discussion

The primary aim of this research endeavor was to generate and evaluate the degree of concordance among raters regarding the elements encompassed within an assessment instrument [41]. The calculation of absolute and relative agreement scores utilizing κw and G produced favorable outcomes, enabling the assessment of assistive technology procedures in children diagnosed with autism spectrum disorder (ASD)[42]. Both instruments exhibit a degree of reliability that spans from moderate to substantial. The scales and items in both instruments have undergone refinement by incorporating feedback from the participants [43]. The attainment of face validity can be accomplished by taking into account the feedback received, particularly from experts who affirm that the measures closely align with their professional standards and the observed scores have led to the examination of the levels of absolute and relative agreement [42, 44].

After conducting a comprehensive analysis of the overall procedure, it is important to highlight that the second and third videos exhibited lower κw values in comparison to the first video [45]. The participants have not provided any explanations for this outcome [46]. One plausible explanation for the disparities observed in the videos can be attributed to the distinct behaviors displayed by the children and their art therapists. This suggests the significance of judges participating in interpretive exchanges during training sessions, akin to the practice exemplified in video 1.

The 3-point Likert rating scale (1-2/3/4-5) exhibits greater levels of relative agreement (G) in comparison to the 5-point Likert rating scale [46, 47]. However, the latter seems to be a more appropriate choice for facilitating the detection of nuanced variations in children undergoing AT treatment. It is generally expected that children diagnosed with Autism Spectrum Disorder (ASD) will demonstrate minimal or negligible changes over the course of treatment, progressing at a relatively slow pace [48, 49]. The sufficiency of the engaged respondents in the third round was deemed satisfactory [50, 51], as there were a total of 34 participants. Based on the findings obtained, it was not expected that the incorporation of supplementary rounds or judges would have resulted in divergent outcomes [47, 52].

In order to address the potential limitations of the instruments and errors in observation, Cicchetti [53] suggested the inclusion of an adequate number of raters. Nevertheless, it is plausible that the rise in video quantity and decline in rater quantity could have contributed to heightened levels of intercoder reliability. After conducting a comparison of the participants' scores, it became apparent that certain raters displayed a proclivity for assigning more extreme scores (1 and 5), while others consistently favoured more moderate scores (2 and 4). The aforementioned discovery suggests that it is crucial to offer training to raters in order to improve their understanding of the instruments [54, 55].

The level of agreement among students' scores was higher in comparison to that of professionals. This

phenomenon does not display exceptional characteristics. Studies conducted with raters of different levels of expertise often produce contrasting results. In specific cases, it has been observed that novices and experts assign scores that are comparable, whereas in other cases, experts demonstrate higher levels of consensus.

In contrast, there exist instances wherein students exhibit elevated levels of agreement scores [56]. The students conveyed that the instruments afforded them utility and educational value. The lack of prior professional experience, which may result in idiosyncrasies in professional decision-making, could potentially contribute to their heightened level of consensus.

Conclusion

The OAT-A instrument enables the evaluation of the triangular association in Assistive Technology (AT) by integrating AT methodologies with theoretical postulations concerning the perception of self, regulation of emotions, adaptability, and social conduct among children who have received a diagnosis of autism spectrum disorder (ASD). A correlation has been observed between the behaviour of children diagnosed with autism spectrum disorder (ASD), their participation in art-making activities, and the behaviour demonstrated by art therapists.

The study suggests that training on the use of the instruments presented in this research can support the systematic evaluation of assistive technology (AT) in children with autism spectrum disorder (ASD) and the assessment of the art therapist's approach. The primary objective of this training program is to emphasize the examination of video excerpts extracted from Acceptance and Commitment Therapy (ACT) sessions. Additionally, participants will be tasked with assessing subscales and actively participating in discussions with colleagues. These activities aim to improve understanding and proficiency in the scoring process.

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Conflict of interest

This study had not any conflict of interest.

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