

Psychometric Properties of the Draw a Story (DAS) Test in Depressed and Normal Children



Ashtari R.¹, Khormaei F.², Rahimi C.¹, Mohammadi N.¹

¹Department of Clinical Psychology and ²Department of Educational Psychology, Shiraz University, Shiraz, Iran

^{1,2}71946-84471, Jomhoori Eslami Blvd, Shiraz, Fars, Iran

Objective: understanding the problems of depressed children is important, as they may express their issues through painting and storytelling, which can provide insight into their excitability and self-image. This study investigated the psychometric properties of the Draw a Story test in children with depression and normal ones.

Material and methods. The participants of this study included 60 fourth and fifth grade students in Yazd province, who were divided into two groups; depressed and normal. Then, each group was evaluated by drawing a story test (DAS).

Results. The results showed that there was a significant difference between the depressed and normal groups in terms of self-image and emotion content, as determined by a two-way analysis of variance. The normal group significantly demonstrated a stronger self-image and emotional state than the depressed group. There was no significant difference between boys and girls in terms of self-image. However, there was a significant difference in their emotional expression, with girls being more adept at expressing their emotions compared to boys. Convergent validity of the DAS was established by correlating it with the DSRS test for self-image and emotion, resulting in correlations of -0.67 and -0.74, respectively. The reliability of the DAS test was assessed using the test-retest method for self-image and emotion, yielding coefficients of 0.82, 0.90, respectively. Additionally, the raters' agreement coefficient was calculated for self-image and emotion, and was 0.68 and 0.82, respectively.

Conclusions. The results of this study revealed the reliability and validity of the test (DAS) in the group of depressed and normal children. This test can be used to diagnose children with depression.

Keywords: depression; emotion content; self-image.

Contact: Romina Ashtari; romina_ghdk@yahoo.com

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Depression in children and adolescents is an issue that requires serious attention due to its prevalence (3% clinical) and (35% non-clinical) and its impact on various social, educational, and professional functions [1]. In general, experiencing a depressive episode in childhood and adolescence is considered a risk factor for future depressive episodes, as well as psychosocial problems [2]. Due to the lack of diagnostic facilities, children with emotional problems often go undiagnosed. These children may be unwilling or lack the words to express their emotional state [3]. Identifying children with mood problems at a young age will lead to more effective interventions in the field of treatment and prevention of its progression compared to adults [4]. Valid and reliable psychological evaluations will be beneficial. Reliability and validity enable the assessment of test competence. The use of art, painting, and story writing in mental health investigations, and diagnosis and treatment has garnered the attention of psychologists. Specifically, painting and coloring provide a way to give meaning to feelings that cannot be easily expressed verbally. In other words, it serves as a socially acceptable means of expression [5]. Silver, one of the pioneers of art therapy, has proposed an effective tool for evaluating children in a non-threatening way using drawings, based on numerous research studies. This tool can predict depression, aggression, and withdrawal in children without the need for direct questioning.

The Story Drawing Test (DAS) was originally compiled by Silver (1988) [6]. Silver emphasized the significance of drawing as a diagnostic tool and explored how it can be used to diagnose emotional content and self-image in drawings created by depressed and aggressive children. This is done by analyzing the drawing and the stories accompanying them [7]. The results of Silver's study have led to the development of a tool that presents the emotional content and self-image of children's imagination. This tool has been proposed to investigate depression and aggression in children [7]. Silver developed the DAS to access the subjects' imagination, thoughts, and feelings. By analyzing the DAS, he proposed the theory that children's emotional responses to the task of painting and their ideas about death and suicide can be useful for early detection of depression in children and adolescents. Investigating the psychometric characteristics of the Story Drawing Test (DAS) in depressed and normal children is the main focus of this research.

Material and methods. The study population consisted of children aged 10–11 who resided in Yazd city in 2013. The statistical sample in this research included 30 children with depression and 30 non-depressed children. Among them, the depressed group consisted of individuals who were diagnosed with depression through the DSRS test and diagnostic interview. The control group was selected from children of the same age group using the

matching method, taking into account control variables such as the family's socio-economic status and the parents' literacy. The sampling method in this research was cluster sampling. In this study, a random selection of schools was made from each educational district. Additionally, fourth and fifth-grade classes were randomly chosen from each school. All the students in these selected classes were asked to complete the DSRS questionnaire. Finally, using a diagnostic interview, 60 children (34 girls and 26 boys) were selected and evaluated using the story drawing test (2005).

Assessments. Drawing a Story Test (DAS): In this research, Drawing a Story test (DAS) was used. The concept of self-image evaluation refers to the main character in a person's drawing, which may intentionally or unintentionally depict the individual creating the artwork. Children usually draw themselves. They portray the story with the main character [8]. After drawing a picture, the person is asked to share a story that reflects the emotional content of the artwork. This artistic evaluation goes beyond focusing on artistic features such as color, quality, and lines. It also pays attention to the content of the painting. In terms of emotional content, there was a significant correlation between DAS and SDT scores. Afterward, the validity of the DAS test was evaluated and confirmed during the assessment of a group of delinquent teenagers [9]. In Iran, the validity and reliability of DAS was investigated in a group of aggressive children. One-way analysis of variance to compare the mean scores of emotional content in the group with aggression and the group without aggression was not statistically significant. The reliability of the DAS was calculated by determining the correlations between scorers for self-image and emotional content, which were 0.67 and 0.9, respectively. Also, the correlation coefficient between self-image and emotional content was 0.71 [10]. The test is conducted in such a way that the subject is first individually asked to choose 2 to 3 pictures from the stimulus pictures. They are then instructed to draw a story based on the chosen pictures and provide a title for their drawing. Then they tell a story based on their painting. The stories are recorded by the examiner. The duration of DAS is approximately 20 minutes, while the scoring process takes about 15 minutes [8]. The stories are graded on spectrum or range from positive to negative based on two aspects: self-image and emotional content, using a prepared scale. The range of scale scores is from 1 to 5.

Depression Self-Rating Scale (DSRS): This scale is one of the most reliable self-measurement scales prepared to measure moderate to severe depression in children and adolescents. The words used in the test items are simple and easily understood by most of the children. The test includes 18 items. This test covers the main range of disturbances resulting from this emotional disorder [11]. The DSRS test has been standardized in Iran by Taghavi (2004), and its validity and reliability have been determined. The validity coefficient of this scale was obtained based on the correlation coefficient between the scores obtained from the depression self-assessment (DSRS) and the short form of the children's depression scale (CDS-A). The retest reliability of this scale was found to be 0.75 when measured within a 4-week period from the initial test.

Structured Clinical Interview based on DSM-IV: This interview is a structured diagnostic tool used to diagnose Axis I disorders based on the symptoms listed in DSM-IV. It is used by a trained tester.

Procedure. The implemented method involved screening depressed and non-depressed children using the DSRS test and a diagnostic interview. Subsequently, depressed and non-depressed groups were matched based on variables such as age, parents' education level, and family's socio-economic status. In the DSRS self-measurement scale, the child was asked to determine which item was relevant to him/her during the past week. In this scoring system, "sometimes" scores one, "never", and "most of the time" correspond to zero and two. This depends on the positive or negative direction of the subjects [11]. In the next step, the story drawing test was administered individually to each participant. They were instructed to select two to three pictures from the stimulus pictures and draw a story with the selected pictures. They were asked to provide a title for their drawing. Finally, the content of the stories shared by the participants was evaluated using two scales; emotional content and self-image. These scales encompassed a range of responses, from strongly negative to strongly positive. This article is taken from the clinical psychology master's thesis approved by Shiraz University ethics committee. Documentary code is 28502132.

Statistical Analysis. A bivariate analysis of variance test was used to investigate the significance of the difference in the scores obtained in the emotional content and self-image scales between the sample groups. Additionally, it was used to determine the significance of the interaction between the groups (depressed and normal) and gender in the self-image and emotional content scales. The bivariate chi-square test was used to investigate the significance of the difference in the frequency of positive to negative responses of the self-image and emotional content scales between the sample groups. Pearson's correlation coefficient was used to check if there is a significant correlation between DSRS and DAS scores, as well as to assess the reliability of DAS test using retest and rater agreement reliability coefficients.

Results. Using the diagnostic interview, 60 children (34 girls and 26 boys) were selected. The sample consisted of 16 boys and 20 girls in the fourth grade, and 10 boys and 14 girls in the fifth grade.

Variance analysis revealed a significant difference in self-image scores between depressed children and normal ones ($p=0.001$, $f(1, 56)=57.42$). Specifically, the mean self-image scores of depressed children were significantly lower than those of normal children. On the other hand, there was no significant difference between the self-image scores of girls and boys. Regarding the interaction between gender and group type, a two-way analysis of variance showed that the difference was not significant ($p=0.27$, $f(1, 56)=1.22$). This indicates that the effect of group type on self-image is not dependent on gender. Variance analysis showed that depressed children had a significant difference in emotional content scores compared to normal children ($p=0.001$, $f(1, 56)=32/64$). On the other hand, there were significant differences between girls and boys in expressing emotional content, with girls showing a greater inclination towards this expression. In other words, girls had higher expression scores for emotional content ($p=0.001$, $f(1, 56)=43/69$), indicating that their emotional content scores were more positive.

The results of the chi-square test showed that there is a significant difference in the frequency of positive to negative self-image responses between the depressed and normal groups

($p=0.001$, $\chi^2=24.13$). In the depressed group, the highest frequency is related to the negative background, while in the normal group, the highest frequency is associated with a positive background. The difference in the frequency of positive to negative responses of emotional content between the depressed and normal groups is significant ($p=0.001$, $\chi^2=21.29$). In the depressed group, the highest frequency is related to the negative background, and in the normal group, the highest frequency is related to the positive background.

When assessing the validity of this test, Pearson's correlation coefficient showed a significant negative correlation between the scores of self-image scale and the DSRS scale ($p=0.001$, $r=-0.67$). In other words, as the scores on the DSRS scale increase, the scores on self-image scale decrease. The correlation between the scores of the two emotional content scales and the DSRS scale is significant ($p=0.01$, $r=0.74$). In other words, as DSRS scores increase, emotional content scale scores decrease.

In order to determine the reliability of the story drawing test through retesting, a second test was conducted two weeks after the first test. The correlation between the test and retest scores was considered as a measure of reliability. Calculating the correlation coefficient between the scores obtained from the test and retest stages of the self-image scale showed that the self-image scale has a high reliability coefficient ($p=0.001$, $r=0.82$). Calculating the correlation coefficient between the test and retest scores of the emotional content scale showed that the emotional content scale has a high reliability coefficient ($p=0.001$, $r=0.9$).

In order to determine the reliability of the story drawing test by estimating the evaluator's agreement coefficient, after the test, two evaluators separately scored the test based on the scales of their image and emotional content. There is a significant correlation between the evaluator's scores in the self-image scale of the story drawing test ($p=0.001$, $r=0.68$), which indicates the high reliability of this scale. There is a significant correlation between the evaluator's scores on the emotional content scale of the story drawing test, indicating a high level of reliability for this scale ($p=0.001$, $r=0.82$).

Discussion. The aim of the present study was to investigate the psychometric characteristics of the story drawing test in depressed and normal children. When comparing the self-image of depressed and normal children in the drawing test, a significant difference between the two groups has been found. The findings of this research are in line with Silver's research [9, 12]. The results of these studies indicate that depressed children had significantly lower scores in their self-image. The above results can be explained by the fact that depressed children have strong negative perceptions of themselves, in other words, they have insignificant feelings and thoughts about themselves. The results obtained from the present study indicate that there is no significant difference between the mean scores of the two sexes in self-image. The findings of this research are in line with research Chamandar F. et al. [13]. On the other hand, it is inconsistent with other results that showed that girls have a higher self-image [14, 15]. The difference in the results of this research shows the influence of culture on the self-image of boys and girls of different cultures. The emotional content of the story drawing test has a significant difference between the two groups. The findings of this research are in line with Silver's research [8, 9, 12]. The results of these studies indicate that depressed children had significantly lower scores

in emotional content. As a possible explanation of the above results it can be stated that depressed children have strong negative perceptions of the world, while normal children have strong positive perceptions of the world. The results obtained from the present study showed that the difference in emotional content between girls and boys in the story drawing test is significant and this difference is in favor of girls. In other words, girls got higher emotional content scores than boys. The findings of this study are in line with previous studies [13, 15, 16]. The interaction of gender and group in expressing emotional content was significant and this showed that the difference between groups in expressing emotional content depends on gender. Depressed girls had higher average emotional content scores than depressed boys, and normal girls had higher emotional content scores than normal boys, and depressed girls had lower emotional content scores than normal girls and depressed boys had lower emotional content scores than normal boys. These findings are consistent with the findings of Earwood and his colleagues [15]. This showed that there is a significant interaction between gender and group type, and depressed boys have the weakest emotional content.

The difference in frequency of self-image spectrum in depressed and normal group was significant. As the results showed, the highest frequency in the depressed group was related to the negative background and the highest frequency in the normal group was related to the positive background. Non-depressed children have strong positive perceptions of themselves and describe themselves as loving, powerful, praiseworthy and effective, while depressed children have a weak and negative self-image. In dealing with stress and unpleasant events, depressed children use self-blaming strategies and focus on thinking more than non-depressed children [17]. This self-blame and inability to overcome the problem leads to a range of negative results such as depression and low self-esteem. Depressed children have a weak self-concept and have negative perceptions of themselves, which explains the fact that these children draw the presented image of themselves in a negative way. In addition, the negative response in self-image has a positive relationship with depression, which is in line with the findings of the present study [18]. The difference in the frequency of the spectrum of emotional content between the depressed and normal groups was significant. As the results showed, the highest frequency in the depressed group was in the negative field and the highest frequency in the normal group was in the positive field. Normal children in the present study had positive emotional content. In general, non-depressed children have strong positive perceptions of their world and imagine dreams about achieving goals, being happy and effective, as well as kind or romantic relationships. Depressed children in the present study had negative emotional content, which can be considered as having emotional content at a weak level. Generally, depressed children have negative perceptions of their world.

They portray fantasies about death and life-threatening situations [8]. Depressed children tend to interpret social events in a negative, unfair and prejudiced way towards others, because the emotional content expresses a person's perceptions of the world [14]. The findings can be explained as follows: these children have a kind of social apathy, they avoid playing with their peers, which is due to their fear of social interaction, these children have little conflict with society, and they also have negative perceptions of interacting with others.

The correlation between DAS and DSRS scores was high, and it was concluded that the DAS has construct validity in the depressed group. The findings of this research are in line with Silver's studies. Silver's research has confirmed the discriminant validity of this test in different groups of deaf people, those with learning disabilities, depressed, withdrawn, aggressive and delinquent.

The test-retest reliability of the story drawing test showed a high level in the two scales of self-image and emotional content. In addition, the reliability of the rater's agreement coefficient in the two scales of self-image and emotional content was obtained

at a high level. The results of this research are in line with Silver's findings [14–16]. The results of these studies indicate the high reliability of this test.

One of the *limitations* of this research is the small sample size and cross-sectional study. It is suggested to conduct a research with a larger sample size and a longitudinal study to examine the evolution of this test among depressed children.

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Ashtari R. <https://orcid.org/0000-0002-7109-3801>

Khormaei F. <https://orcid.org/0000-0001-9357-7068>

Rahimi C. <https://orcid.org/0000-0002-7180-364X>

Mohammadi N. <https://orcid.org/0000-0002-0413-2743>