



Original Article

A comparison of kinetic family drawing indicators in intact and divorced children

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Abstract

Introduction: Projective techniques such as drawing tests to detect psychiatric disorders in children have attracted the attention of many psychologists and therapists. This study aimed to compare the drawing indices of Kinetic Family Drawing Test in intact and divorced children.

Materials and Methods: The sample of this descriptive study consisted of 60 subjects (30 intact boy children and 30 divorced boy children) in the city of Bojnord in April and May 2015. Divorced children were selected purposefully and multi-stage. After studying their files, teacher and principal participation, 30 intact children were all homogenized based on their age, gender, educational level, parent's educational background and socio-economic level, and living condition. Children's drawings were rated by three trained raters, who were kept intentionally unaware of the participants' group membership, based on test scoring guidelines. The data were analyzed via two-way Chi-square test using SPSS software version 22.

Results: According to the test results, the 26 signs Kinetic Family Drawing Test, the frequency of 16 symptoms between the two groups was statistically significant ($P < 0.05$). The rest of the symptoms were not significantly different ($P > 0.05$).

Conclusion: According to the significant difference between the symptoms of mental problems (depression, anxiety, aggression and interpersonal relationships of family members) of the two groups in this test and its high differential power in the diagnosis of mental problems among intact and divorced children, the test can be used to identify and diagnose mental problems of these children in schools and counseling clinics by early identification and timely treatment to prevent children from bad and destructive effect in the future.

Keywords: Child, Divorce, Drawing, Family

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Introduction

Family is the smallest social unit, but it is the most stable and established social groups. The upbringing and nurturing of children take place in the family environment and the family is the first milieu where emotions, feelings, self-concept, self-esteem and interpersonal abilities are fostered in children (1). One of the adverse issues plaguing individuals, communities, and especially children in marital conflicts is parental disparities which may leads to divorce (2).

A social approach to divorce and children of divorce along with the manner of identifying and understanding the problems of such children have

urged researchers to develop tests for the detection of deeper problems of these children so that diagnostic and therapeutic measures can be adopted with the least resistance on the side of children (3). One of the key strategies adopted by clinical psychologists in recent decades to identify psychiatric disorders in children includes projective techniques such as drawing tests. These tests, consistent with new approaches to family therapy (systematic view of the family) have caught the attention of a growing number of psychologists and researchers.

With the rapid increase of divorce in the world in the past 30 years, clinicians and researchers have begun to explore the importance of this unfortunate event in the growth and compatibility of children (1). Given the decreased ratio of marriage to divorce in the past 10 years (from 9.8 in 2003 to 5.0 in 2013) and the growing trend of divorces (73882 cases of divorce in 2003 compared to 155369 cases in 2013)

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in Iran (4) and its long-term and short-term adverse effects on children, clinical psychologists and family counselors are planning to adopt technical and efficient strategies to alleviate the harmful effects of divorce on parents and especially children.

For the children, family breakdown marks the end of their world. Family disputes and conflicts are among issues that not only disrupt the warm and safe family environment and threaten children's physical and mental health, but also severely undermine social order and security (5).

Among the negative effects of divorce on children are extreme sense of guilt, low socialization, severe depression, low self-confidence, criminal behaviors and physical and sexual abuse, low self-esteem, imitation of dysfunctional habits such as lying and stealing, aggression, denial, excessive anxiety, stomach pain and frequent headaches (6). The studies of researchers have demonstrated that children experiencing the death of one of their parents are more likely to deal with this issue than children who have been the victim of divorce. Some common sentiments in these children are denial and rejection, sense of loss, anxiety, incompatibility, loneliness, aggression, lack of perseverance, physical pain such as headaches, poor appetite, nausea and vomiting (7).

Clinicians and psychologists believe that with early detection and timely treatment, many childhood disorders can be resolved and their adverse and destructive influence in the future of children can be largely hampered. However, as the techniques of discovering many internal problems and disorders in children, especially the unconscious ones, are mainly based on questionnaires designed for parents and teachers or clinical interviews and other objective methods, they are unable to provide comprehensive information to therapists. Researchers argue that a simple interview with a child can never unravel his/her clear and true feelings toward family, for children, being aware of the investigative intentions of adults, uses techniques like silence, lying or irrelevant statements as a means of self-defense (8). Therefore, in recent years, a host of psychologists and therapists have utilized projective techniques to identify these disorders, claiming that the effectiveness of projective techniques in detecting internal and unconscious disorders of children is greater than other diagnostic methods (9-14).

One of the useful and effective methods of projection that has attracted the attention of many experts is drawing tests. Using various drawing instructions, clients can illustrate both conscious

perceptions and portray unconscious emotions (15). For years, psychologists have been under the assumption that children's drawings are outcomes of meta-cognitive and perceptual-motor aspects that are created based on emotions so that children's drawings, as a work of art, are of significant value in terms of demonstrating psychological characteristics or emotional states of children (5).

There are plenty of different drawing tests, which depending on their specific application, are employed in counseling and psychological clinics. These tests may include Draw-A-Person Test, House-Tree-Person Drawing Test, Draw a Family Test, Friends Drawing Test and Kinetic Family Drawing (KFD).

The first three tests, - Draw-A-Person Test, House-Tree-Person Drawing Test and Draw A Family Test - due to the static and immobile nature of members, portray figures as strict and rigid, which makes it difficult to derive useful information from these tests. For this reason, Burns and Kaufman (16) proposed the Kinetic Family Drawing, which allows the analysis of family based on psychoanalytic principles and as an integrate system. In addition to an analysis of unique children's behaviors, it allows the assessment of attitudes, feelings and interactions of a person towards family members. Kinetic Family Drawing portrays a clear picture of interpersonal interactions and relationships among family members (17).

Due to particular features of kinetic family drawing such as delightfulness, a means of entertainment and game for children and a useful test to identify interpersonal interactions, anxiety, aggression, and depression (11), it is more efficient than other existing questionnaires and clinical interviews, which are often associated with increased stress and resistance on the side of children in identifying and assessing internal and interactive disturbances of children. Despite the importance of this test and its widespread clinical application by foreign specialists (18), it has not been used clinically by Iranian specialists. As such, this study aims to evaluate and compare the drawing signs (depression, anxiety, aggression and interpersonal relationships of family members) of Kinetic Family Drawing (KFD) in normal children and children of divorce.

Materials and Methods

This is a descriptive research with a causal-comparative design that was conducted in April and May of 2015. The study population consisted of male primary schools in the city of Bojnord, out of

which five schools were selected randomly and 30 children of divorce were identified. Based on a profile analysis of children of divorce and participation of teachers and principals, 30 normal children were selected as peers using one-to-one correspondence in terms of factors such as age, sex, educational level, parental education, parental socio-economic status and place of residence. Prior to the test, necessary explanations were offered to participants and they received parent's consent form. In the absence of parental consent, they were free to withdraw from the study. Inclusion criteria in the group of children of divorce were: being a child of divorce, male gender and studying in the third to sixth grades. To select normal children, for every child of divorce in a class, one of his peers in the same class was chosen. Children that failed to meet the aforementioned criteria were excluded from the study.

Research instruments

- *Kinetic Family Drawing Test*: Burns and Kaufman (16) are among the designers of this test and made significant improvements to this test. They voiced their support for the guidelines which emphasized the depiction of family members "in action". The key parameters of the test include: action, symbol, style, image distance, barriers and drawing characteristics.

Researchers have demonstrated the efficiency of the test in the following cases: it offers a clear picture of interpersonal interactions and relationships between members of a family (17,19); it has systematic orientation and complicate family relationships can only be demonstrated through drawing (18); it is a promising test for cultural studies (20); it holds promises as a suitable means of revealing the unconscious defense mechanisms of children (13); it offers an effective method for evaluating families who had children with muscular dystrophy (19); it is a suitable tool for the evaluation of children with endocrine disorders and anxiety (21); it is a useful technique to assess cognitive features of a family to understand the internal problems in children's behavior (16); it is a developed diagnostic tool for the evaluation of self-concept (14). McPhee and Wegner evaluated the reliability and validity of kinetic family drawing by studying the drawings of 102 emotionally disturbed children and 162 healthy children. For this purpose, five members of the research team were trained for scoring. The results indicated high reliability of the test (in the range of 0.65 to 0.87) with respect to the variable of style (13). Moreover, Mostkoff and Lazarus examine 50 children (25 girls and 25 boys)

and achieved a reliability of 0.86 to 0.97 for kinetic family drawings in regard to the variables of style and barriers (22). Apart from a review of literature on scoring and interpretation of the test, the researcher used the revised version of the test standardized by Kim and Suh. This version was made of 26 drawing signs which were classified in six major categories of drawing characteristics (erasure, Arm extensions, omission of basic body parts, rotation, shading or crosshatching, Figures on back, fixed posture, omission of family members, error of relative height (of family members), Location of self (by age order and test instructions), distance (physical distance of family members), barriers (walls or obstacles), Actions (Inaction of father figure (non-working father), Inaction of mother figure, inaction of self-figure, exclusion of interaction with family members, exclusion of interaction with self (lack of interpersonal relationship); Symbols (Objects that could be thrown such as a ball (the field of force among the family 1), Objects that emit heat or light (the field of force among the family 2)•), dangerous objects such as gun, sword or fire (the field of force among the family 3), flowers, watering flowers (the field of force among the family 4); and Style (Compartmentalization (intentional separation of family members by lines), edging, underlining (drawing more than one line to cover the lower part of the drawing), encapsulation (drawing members in form of lines and objects). The presence of each signs in the drawing scored one and its absence scored zero, and at the end the frequency of signs in each group was determined and subjected to analysis.

- *Teacher's Report Form of Achenbach System of Empirically Based Assessment (ASEBA)*: This form is filled out based on child's condition in the last six months. This form consists of scales designed based on Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) which include emotional, anxiety and physical problems, attention deficit/hyperactivity, bold defiance and normative problems. The items of each scale in this questionnaire consisted of three alternatives, "very true or often true", "somewhat or sometimes true" and "not true", which were scored 2, 1 and 0 respectively. For the standardization of Achenbach System of Empirically Based Assessment in Iran, Minaei first made necessary linguistic, cultural and social adjustments and then applied the checklist to a sample of 1438 subjects including 689 female and 749 males selected from the north, center and south of Tehran and a number clients referring to

psychiatric wards of hospitals. The internal consistency of Achenbach System of Empirically Based Assessment was high (in the range 0.65 to 0.92) for TRF. The alpha coefficients of DSM-IV-based syndromic scales was satisfactory (ranging from 0.62 to 0.92) for the TRF. Moreover, the alpha coefficient of empirically-based syndromic scales was satisfactory (in the range of 0.75 to 0.95) for TRF. The content validity, criterion-related validity and construct validity of this questionnaire have been approved in Iranian society (15,23).

In this study, drawings were given to three trained evaluators for scoring (presence or absence of signs). To avoid assessment bias in scoring, each of the drawings was coded. The teachers' Achenbach form was also scored and the clinical domains of children of divorce were also determined in this form.

Considering the absence of any evidence in regard to the validity and reliability of KFD in Iran, to evaluate the convergent validity of the test, correlation coefficients of the frequency of KFD drawing signs (symptoms of depression, anxiety, aggression and interpersonal relationships) and scores of Achenbach teacher's test were computed for related scales and for each of the evaluators. The results were significant at the level of 0.05 and therefore confirmed the convergent validity of the test. Further, to check the reliability of scoring by evaluators, the frequency of test indicators (determined by evaluators) were compared, but no significant difference was observed in relation to frequency in both normal children and children of divorce ($p > 0.05$), which indicated the consistency of evaluators' scoring. The data were analyzed using two-way chi-square test and SPSS 22 software.

Results

Of 60 normal children and children of divorce, 14 (23.3%) were in the third grade, 16 (26.7%) in the fourth grade, 12 (20%) in the fifth grade and 18 (30%) in the sixth grade of elementary schools. The number and percentage of normal children and children of divorce were identical in terms of grade level. In Table 1, the frequency of drawing signs in normal children and children of divorce have been shown for each symptom of psychological scales (depression, anxiety, aggression and interpersonal relations) in the kinetic family drawing test. As can be seen, the frequency of drawing symptoms in normal children were as follows: 27 cases of depression (0.15%), 28 cases of anxiety (13.3%), 44 cases of aggression (18.3%) and 57 cases of interpersonal relations (0.19%). Moreover, in

children of divorce, the frequency of drawing symptoms were as follows: 96 cases of depression (53.3%), 73 cases of anxiety (34.7%), 92 cases of aggression (38.3%) and 117 cases of interpersonal relationships (39%). According to the table, the frequency of drawing signs in all scales was greater in children of divorce compared to normal children.

The total number of symptoms for each scale is computed by multiplying the number of symptoms of each scale with 30.

Table 1. The frequency of drawing symptoms in both groups of normal children and children of divorce for each symptom of psychological scales

Drawing signs	Normal children		Children of divorce	
	Frequency	Percentage	Frequency	Percentage
Depression (symptoms 1-5-8-10-15-18)	27	15	96	53.3
		Total		
Anxiety (3-5-12-15-16-25-26)	28	13.3	73	34.7
		Total		
Aggression (2-4-7-9-16-19-21-25)	44	18.3	92	38.3
		Total		
Interpersonal relationships (4-6-8-9-11-12-13-14-17-24)	57	19	117	39

As shown in Table 2, the results of chi-square test regarding the differences between normal children and children of divorce in drawing signs of kinetic family drawing suggested that of 6 symptoms of depression, 5 were statistically significant between the two groups and only shading and crosshatching was not significantly different. There was a significant difference between the results of normal children and children of divorce in relation to frequency of erasure, omission of family members, location of self, inaction of self-figure, and exclusion of interaction with family members, with the frequency of above scales in children of divorce being greater than normal children.

Table 2. Comparison of drawing signs of depression in normal children and children of divorce

Drawing signs of depression	Normal children		Children of divorce		Chi square	P
	Frequency	Percentage	Frequency	Percentage		

Erasure	9	30	22	73.3	11.27	0.001
Shading and crosshatching	6	20	8	26.7	0.37	0.542
Omission of family members	5	16.7	22	73.3	19.46	0.001
Location of self	3	10	15	50	11.42	0.001
self-passiveness	2	6.7	11	36.7	7.95	0.005
Exclusion of interaction with family members	2	6.7	18	60	19.20	0.001

As shown in Table 3, of 7 drawing signs of anxiety, only 5 were statistically significant between the two groups. There was a significant difference between the results of normal children and children of divorce in terms of the frequency of omission of basic body parts, barriers (walls or obstacles), inaction of self-figure, dangerous situation and underlining, and the frequency of all above scales in children of divorce was greater than normal children.

Table 3. Comparison of drawing signs of anxiety in normal children and children of divorce

Drawing signs of anxiety	Normal children		Children of divorce		Chi square	P
	Frequency	Percentage	Frequency	Percentage		
Omission of basic body parts	6	20	15	50	5.93	0.015
Shading and crosshatching	6	20	8	26.7	0.373	0.542
Barriers	1	3.33	13	43.3	13.41	0.0
Inaction of self-figure	2	6.7	11	36.7	7.954	0.005
Dangerous situation	2	6.7	14	46.7	12.27	0.0
Underlining	1	3.33	9	30	7.68	0.006
Encapsulation	10	3.33	14	46.7	1.11	0.292

As seen in Table 4, of 8 signs of aggression, 4 were significantly different between the two groups. The results of normal children and children of divorce were significantly different in relation to the frequency of fixed posture, dangerous situation, objects that could be thrown such as a ball (the field of force among the family 1), underlining, omission of basic body parts, barriers (walls or obstacles) inaction of self-figure, and dangerous situation, and the frequency of all above scales in children of divorce was higher than normal children.

Table 4. Comparison of drawing signs of aggression in normal children and children of divorce

Drawing signs of aggression	Normal children	Children of divorce	Chi square	P
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	Frequency	Percentage	Frequency	Percentage		
Arm extensions	14	46.7	13	43.3	0.067	0.795
Rotation	2	6.7	5	16.7	1.45	0.228
fixed posture	6	20	15	50	5.93	0.015
Error of relative height (of family members)	14	46.7	17	56.7	0.601	0.438
Dangerous situations	2	6.7	14	46.7	12.27	0.0
Objects that could be thrown such as a ball (the field of force among the family 1)	3	10	14	46.7	9.93	0.002
Dangerous objects such as gun, sword and fire	2	6.7	5	16.7	1.45	0.225
Underlining	1	3.33	9	30	7.68	0.006

As shown in Table 5, of 11 symptoms of interpersonal relationships, 5 were statistically significant in the two groups in terms of frequency. Moreover, there was a significant difference between the results of normal children and children of divorce in relation to omission of family members, physical distance of family members, barriers (walls or obstacles), exclusion of interaction with family members, compartmentalization (intentional separation of family members by lines), and the frequency of all above scales in children of divorce were higher than normal children.

Table 5. Comparison of drawing signs of interpersonal relationships

Drawing signs of interpersonal relationships	Normal children		Children of divorce		Chi square	P
	Frequency	Percentage	Frequency	Percentage		
Rotation	2	6.7	5	16.7	1.45	0.228
Figures of back	1	3.33	3	10	1.07	0.301
Omission of family members	5	16.7	22	73.3	19.46	0.0
Error of relative height (of family members)	14	46.7	17	56.7	0.601	0.438
Physical distance of family members	5	16.7	14	46.7	6.23	0.012
Barriers	1	3.33	13	43.3	13.41	0.0
Inaction of father figure	7	23.3	12	40	1.92	0.165
Inaction of mother figure	10	33.3	13	43.3	0.635	0.426
Exclusion of interaction with family members	3	10	13	43.3	8.523	0.004
Compartmentalization	2	6.7	10	33.3	6.66	0.010
Edging	2	6.7	5	16.7	1.45	0.228

According to the results of Chi-square test regarding the differences between normal children and children of divorce in drawing signs of kinetic family drawing, of 26 drawing signs, 16 were significant different between the two groups. There

was a significant difference between the results of normal children and children of divorce in relation to the frequency of erasure, omission of basic body parts, fixed posture, elimination of family members, location of self, physical distance with family members, barriers (walls or obstacles) inaction of self-figure, dangerous situation, exclusion of interaction with self, exclusion of interaction with family members, Objects that could be thrown such as a ball (the field of force among the family 1), compartmentalization (deliberate separate of family members using lines), underlining, and the frequency of all above scales in children of divorce was greater than normal children. In contrast, the frequency of objects that emit heat or light (the field of force among the family 2), flowers, watering flower (the field of force among the family 4) in normal children was higher than children of divorce, and the two groups were significantly different in this regard.

Discussion

This study aimed to compare drawing signs of kinetic family drawing in normal children and children of divorce. According to the results, the two groups were significantly different in 5 symptoms of depression in kinetic family drawing, but this difference was not significant in one case (shading and crosshatching). This is consistent with the findings of (2,3,5,6,8,11,13-16,24-28). The above findings can be explained with regard to the fact that the most important family issues affecting childhood depressions were parent's separation and children's living with one parent, which intensified depression, especially in children of divorce (1). Ghorbani (2) examined depression in normal children and children of divorce, finding that the prevalence of depression in children of divorce (26%) was three times higher than normal children (8%). The drawing signs of shading and crosshatching were not significantly different between the two groups. It is because primary children in Iranian culture tends to scrawl at the bottom of their drawings using various colors that symbolizes grass or the floor, which is often either stimulated by training or rooted in the culture. It should be noted that shading and crosshatching is more evident in middle school students for most primary teachers encourage children to use different colors, so their shading is not of the desirable quality.

According to the findings, of 7 signs of anxiety in kinetic family drawing, 5 were significantly different between the two groups, but this difference

was not significant for two signs of crosshatching and encapsulation. The results are in agreement with those of (5,10,11,16, 22,26,29,30). Divorce is a stressful event that causes anxiety in children. Low cohesion in divorce and parental conflict before and after the divorce deteriorate the confidence and undermine sense of responsibility in children (1). Fan (11) investigated the kinetic family drawing in children from different family backgrounds, finding that by changing family structure, stress and anxiety in built up in children and with the continuation of this struggle, anxiety grows. Anxious children have a tendency of strong self-criticism and effort to prepare the ground for their destruction. These dangerous situations are evident in their drawings.

Dadsetan (10) found a series of symptoms in drawings of anxious children including: using black pencil and drawing black spots, drawing very light or dark lines, drawing little men and excessive use of the color purple. The results of the present study, in keeping with this study, suggest that the frequency of above signs in children of divorce is significantly higher than normal children. In addition to shading and crosshatching, encapsulation was another symptoms that did not vary significantly between the two groups. This is mainly due to the high frequency of encapsulation in all primary school children, which is rooted in their lack of expertise in drawing shapes is details. That most primary children refuse to draw fingers, toes, torso and arms that fit with other body parts is due to their low painting skills. This finding is inconsistent with the results of Kim and Sue (16).

According to the findings of this study, of 8 signs of aggression in kinetic family drawing, 4 were significantly different between the two groups. The results are in agreement with the study of Spigelman et al (28) and similar studies (6,8,14,22-27,31). The above finding can be explained with regard to the fact that one common behavioral disorder in children is aggression caused by their parents' divorce, which can exert disastrous effects on a child's life. Also, boys are more susceptible to negative effects of divorce and they are more likely to resort to external and controlled behaviors such as aggression and misconducts as a reaction to their parental divorce (1). Yaghoubi et al. (6) in their study on aggression in normal children and children of divorce reported that children are forced to make a decision at the time of divorce to either defend their parents or withdraw from them. With increased conflicts, attachment becomes more insecure and anxiety grows, thereby resulting in severe aggression in children.

Spigelman et al (28) examined the family drawing of children of divorce and normal children, reporting that the former group displayed greater anxiety when witnessing their parental conflict and perceived their environment as aggressive, which led to gradual change in their character.

The two groups of normal children and children of divorce were not significantly different in arm extensions. It is consistent with the finding of Kim and Suh (16) according to which such arm extension is a sign of environmental dominance. However, it is not in agreement with the findings of Pourahmadi et al (9) who considered arm extension as a sign of aggression.

Moreover, the results did not show a significant difference between normal children and children of divorce in regard to the sign of rotation. The low frequency of this sign in drawings of the two groups showed little difference. This is also consistent with the study of Kim and Suh (16) who perceived rotation as a sign of jealousy and rejection of a particular person by the aggressive child.

According to the results of the present study, of 11 signs of interpersonal relationships in kinetic family drawings, 5 were significantly different between the two groups. The findings are in agreement with the results of (11,14,16,27,31). The above findings can be explained in that children whose parents are on the verge of divorce or already separated, have bitter experiences of conflict, tension and struggles and consequently low interpersonal relationships in the family, which reduce their self-confidence and increase their need to feel safe, supported and defended. By drawing barriers and obstacles, children actually protect themselves against stress (27).

Sajedi and Habibi (32) demonstrated that children of divorce and normal children were different in terms of individual and social adjustment and interpersonal relationship with family members,

with the children of divorce scoring lower mean scores in all above scales.

The new findings revealed the significant differences between two signs of "objects that emit heat or light (the field of force among the family 2) and "flowers, watering flowers" (the field of force among the family 4). Unlike other symptoms, the prevalence of these symptoms in normal children was higher than children of divorce. This is inconsistent with the findings of Kim and Suh (16) who perceived the first sign as the propensity towards love, dependence and implication of depression, and the second sign as a desire for care and compassion (which emanates from the absence of love and hatred). This difference can be explained in terms of particular view of society and culture, because light is the source of hope and kindness and flowers is a sign of hope, peace, with most children using both or one of the signs in their drawings. This is in agreement with the findings of Heydari and Rahimi (3) and Moradi Motlagh, Abedin and Heydari (15).

The Kinetic Family Drawing Test was only implemented on a group of normal male children and children of divorce in the city of Bojnord. It is recommended that future studies focus on both female and male children in other population groups. Given that the drawing can be influenced by the psychological state of a person during the test, it is better to run the test at different time intervals.

Conclusion

Kinetic Family Drawing Test is useful test that marks a transition from unconscious defense mechanisms to the reception of genuine and less-defensive response. As a result, it can be used for the detection and diagnosis of psychological disorders of children at schools, clinics and counseling centers to prevent their devastating impact on children in the future.

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