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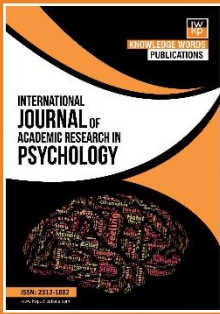
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The Effectiveness of Cognitive Interventions on Distress Level and Quality of Situational Life in Children Suffering from Cancer

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Abstract

The present research has been conducted with the purpose of evaluating the effectiveness of using both cognitive interventions of preparation in the child and parents and siphoning attention in the child on the reported distress caused by sampling or injection of cerebrospinal fluid (CSF) and the quality level of situational life in children suffering from cancer. The current research is a totally experimental study with a pretest-posttest design along with a control group. Statistical population consists of entire children affected by all kinds of cancers who had referred to Bou Ali and Amir Kola hospitals in Sari and Babol. 30 children were selected and put randomly in two experimental and control groups. The children were visited twice; at first visit, both groups were placed under routine care and, at second visit, the experimental group received cognitive interventions and the control group received routine care. Data was gathered through demographic questionnaire, CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) behavioral observation scale and the Pediatric Quality of Life Inventory TM Present Functioning Visual Analogue Scale (PedsQLTM vas). Data collection was conducted using the statistical method of covariance analysis. The results reveal that

the cognitive interventions of preparation in the child and siphoning attention in the child can reduce distress level and improve the quality of situational life in children. It was discovered that there is a negative and significant correlation between quality of situational life and distress. It was concluded that cognitive interventions are influential in the reduction of distress level and improvement of quality of situational life in children suffering from cancer who are placed under cerebrospinal fluid sampling.

Keywords: Distress, Cancer, Quality of Situational Life, Cognitive Interventions.

Introduction

In the past, it was generally thought that psycho-physiological disorders include only some diseases (such as ulcers, headaches, asthma, and hypertension). The new approach makes this diagnosis applicable to any disease, because we now know that psychological factors can affect any type of disease (Kring et al., 2007; Shamsipour, 2009). Throughout the course of cancer, especially in the course of treatment, due to the side effects of medication, there is a possibility of the occurrence of physical changes. Such changes can affect the patient's self-awareness, self-esteem and self-worth and acceptability.

Nearly all children experience pain at some point in the course of the disease. This pain may be produced by cancer itself or following the treatments and the diagnostic-therapeutic actions and/or occur due to non-cancer related accidental pains. Children with leukemia frequently suffer from bone and joint pain, yet the main pains are generally related to remedial measures. For many children, these pains are the worst part of the disease and are intensified with repeated diagnostic and therapeutic measures. Measures such as intrathecal medication (IT) or lumbar puncture (LP), finding blood vessels, surgical operations and side effects of chemotherapy and radiation and infections caused by the reduction of white blood cells can create pain in children to a great extent. In addition to physical discomfort developing in children followed by the disease and diagnostic and therapeutic measures, concern and anxiety caused by these conditions also affects children in different ways (Morvarid and Delpisheh, 2000).

Distress is a multifactorial unpleasant emotional experience, with psychological (cognitive, behavioral, emotional), social and/or spiritual nature which might interfere with the ability for the effective resistance to cancer, its physical symptoms and its treatment (American Academy of pediatrics committee on psychosocial Aspects of child and family Health and American Pain society task force on Pain in Infants, children and Adolescents, 2001). All patients suffering from cancer experience some levels of distress along with cancer and its treatment in all stages of the disease. Since the early 21st century, with the help of growing research literature, screening, assessment and management of psychological distress in patients suffering from cancer is supported (Holland & Alici, 2010). In recent years, cancer supportive care has grown rapidly so as to even be able to improve controlling symptoms in patients in the face of treatment. To a great extent, attention has been concentrated on physical symptoms and especially pain. To a considerable extent, attention to "mental suffering" has been less, meanwhile, Shakespearean observation is well related to patients with cancer, when the mind is ordered to suffer with the body, "it is the suffering of the mind" which the psychology of cancer addresses in order to reduce distress and improve quality of life (Holland, 2002). Inhibition of distress, is often central to the patient's well-being and ability to communicate with others and leads to a normal family life, as well as agreement with the treatment. Acute and

chronic forms of distress (in which depression and anxiety often occur together) interfere in the treatment of cancer (Holland and Bottger, 2005; Holland et al., 2008).

With the increase in the survival rate of cancer, a considerable focus has been given to health-related quality of life in patients (Butt et al., 2008). Cancer and cancer treatment are accompanied with a wide range of symptoms which can affect the patient's quality of life (Martinson et al., 2008; Reyes-Gibby & Cleeland, 2005). Symptoms can be divided into four categories of physical (pain-nausea, fatigue), psychological (anxiety, confusion, depression), social (loss of role, lack of support) and existential (lack of meaning of life) (Soni & Cella, 2002). Common symptoms of cancer and cancer treatment significantly harm the daily functioning and quality of life in patients (Reyes-Gibby & Cleeland, 2005). Quality of life is a multidimensional construct, including the impact of the disease on physical, psychological and social well-being (Soni & Cella, 2002). With the knowledge that children show and report high levels of distress during the painful medical procedures, the development and evaluation of interventions done in this field is an important effort (Jacobson et al., 2001; quoted by Mac laren & COHEN, 2005). Results of a meta-analysis conducted by Uman et al (2007) indicate that CBT interventions can be effective on pains caused by the needle, especially in the reduction of behavioral distress induced by the sampling of bone marrow. Among the cognitive-behavioral interventions, siphoning attention and, afterwards, hypnotizing had the largest effect. Thus, considering the importance and impact of the child's distress in cancer progression, treatment efficiency and the quality of life of children between 8 to 12 years suffering from cancer, this study evaluates the prevalence of distress level in hospitalized children with cancer in Bou Ali Hospital in Sari City Amir Kola in Babol City and investigates the effectiveness of cognitive interventions on the clinical attention to psychological problems associated with cancer in children. Accordingly, the hypotheses of this study include:

1. Cognitive interventions are effective on reducing the amount of distress in children suffering from cancer.
2. Cognitive interventions are effective on increasing the quality of situational life in children with cancer.

Methodology

Method of the present study is of the type of a pilot research with pretest-posttest design with a control group. The population under study are all children suffering from different types of cancer with the eligible age (8 to 12 years) who had referred to Bou Ali Hospital Complex in the city of Sari and Amir kola in Babol from 07/05/2013 until 09/07/2013 to do LP / IT procedures and their number is 35. Of the 35 children with various types of cancer who visited the Hospital Complexes of Bou Ali and Amir Kola, first, 30 people were selected with the available sampling method and, then, 15 of them were chosen as the experimental group and 15 as the control group with a simple random selection method.

Research Tools

1) CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) behavioral observation scale: in this research, CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) behavioral observation scale was used for the measurement of distress level caused by pain of painful medical procedure IT/LP. CHEOPS behavioral observation scale has been designed to measure pain after surgery in young

children who cannot offer an accurate report of pain. This tool is a multidimensional behavioral scale (Naar-King et al., 2004) and is suitable for ages 1-12 years old (Blount et al., 2008). The scoring method of the questionnaire is that CHEOPS behavioral observation scale has six behavioral response codes: crying, facial expressions, child's verbal, muscle tension, touch and leg calves. For each behavioral response, along with behavioral explanations, there are several gradings. The gradings are not sequential. However, the overall score of CHEOPS behavioral observation scale is sequential and has a range from 4 to 13 (Naar-King et al., 2004). The reliability and validity of this scale also include: the reliability range among CHEOPS behavioral observation scale assessments is between 90% and 99%. The validity of the tool structure has been demonstrated through the evaluation of changes in CHEOPS scores before and after the introduction of an anti-pain to children who experience post-operative pain. The scores fluctuate in the same expected direction. Criterion validity of this tool was calculated through two assessment groups, which, simultaneously, estimated post-operative pain in children, based on a visual analog scale and CHEOPS behavioral observation scale. A significant correlation, 52%-81%, was seen between the evaluators (Naar-King et al., 2004). In their study, Shahabi et al. (2007) calculated the reliability of this tool through the agreement of evaluators. The spearman coefficient was 91%, and, in the Wilcoxon test, $P=0.965$, there was no significant difference between the observers.

1) The Pediatric Quality of Life Inventory TM Present Functioning Visual Analogue Scale (PedsQLTM vas)

Quality of situational life in children was evaluated using the Pediatric Quality of Life Inventory TM Present Functioning Visual Analogue Scale (PedsQLTM vas). The PedsQLTM vas has been designed as an ecological momentary assessment (EMA) instrument to rapidly measure present or at-the-moment functioning in children and adolescents. The PedsQLTM vas estimates child self-assessment and report of anxiety, sadness, anger, fatigue and pain utilizing six developmentally appropriate visual analogue scales. This scale has been constructed based on the Pediatric Pain Questionnaire (PPQ), in the Varni/Thomson Pain Intensity VAS format (Sherman et al., 2006). PedsQLTM consists of self-assessment in children between 5 and 18 and parents' report of children from 2 to 18 (Varni et al., 2001; Varni et al., 2003; Sherman et al., 2006). In fact, PedsQLTM emphasizes on children's perceptions (Varni et al., 1987; Varni et al., 1988; Thomson et al., 1987; quoted by Sherman et al., 2006). The developments in the ecological momentary assessment emphasize on the benefits of measuring symptoms at the moment in ecologically related environments (Stone et al., 1994; quoted by Sherman et al., 2006). Measuring present or at-the-moment functioning of pain intensity in children has been applied for over 20 years using Vas scales (Varni & Stein, 1991; Grouth, 1990; quoted by Sherman et al., 2006). The scoring of this scale is conducted in a range of 0 to 10, so that 0 is placed beside the happy face and 10 is placed beside the sad face. As a result, the higher score is indicative of higher levels of anxiety, sadness, anger, fatigue and pain (Sherman, 2006). Sherman et al. (2006) have detected the reliability and validity of this instrument. This instrument was presented to 70 pediatric patients with an age range from 5 to 17 years and their parents at the time of admission in hospital (T^1) and two hours later (T^2). The hypothesis was that Emotional Distress Summary Score of PedsQLTM vas (anxiety, sadness, anger, worry) and vas fatigue of size correlations will have an average to large impact on PPQ Pain Intensity VAS and the alignment of patient and parents will increase throughout time. In a research in Iran conducted on the quality of life in children

the content validity of this scale was evaluated by 11 experts (Board of Education members of Faculty of Psychology and Educational Sciences Shahid Beheshti University) and the rate of congruence and lack of congruence in each of the items of parent and child and adolescent form was detected in the scale with a range of 0-3 (0 indicating lack of congruence and 3 indicating complete congruence). On the whole, these people considered this scale appropriate for the assessment of quality of situational life in children.

Implementation Method

In the current study, first, to receive samples in Mahak medical center clinic and pediatric blood and chemotherapy section in Bou Ali Hospital, the researcher visited children suffering from cancer who had to do LP/IT based on specific treatment protocol and doctor prescription and also had the conditions to participate in the project. This identification was done through receiving information from the IT room assistant and clinic secretary in Mahak center and head of chemotherapy section and pediatric center assistant in Bou Ali. If the child and parent were placed in the experimental group, on the same day, the parent was given the manual for the preparation of the parent and the story of the medical procedure of cerebrospinal fluid sampling and he/she was asked to study the manual 3 to 7 days prior to next visit and read the story to the child and 1 to 3 days prior to next visit also the mother should ask the child to paint each part of the story and color it and bring it with herself. The date for next visit of the child to do LP/IT with the parent and nurse and also the patient file and assessing treatment protocol was investigated by the researcher. The parent was asked to give their contact number to check whether or not the story had been read to the child and/or to be reminded to do the homework and also in the case of any change in treatment protocol and LP/IT procedure, the researcher would be aware of that in order to be able to coordinate with that change. The intensity of distress in the child during sampling or injection of cerebrospinal fluid on the first visit was conducted with the CHEOPS behavioral observation scale instrument as the pre-test. At next visit of the experimental group child, the story book was read prior to conducting LP/IT in the waiting room in order to do LP/IT again and each page of the child's drawing was encouraged with childlike stickers to prepare the child for medical procedure. After delivering the story book and examining the child's drawing, the child was accompanied with the researcher to the cerebrospinal fluid stage and while the doctor and nurse were getting prepared to perform LP/IT using DVD device, a favorite cartoon (Tom and Jerry) was being shown for the child (siphoning audio-visual attention). Cartoon display began as soon as the child was on the bed and preparing for injection and/or sampling. The child was said that "when the doctor is doing his job, we can watch a cartoon together."

In the control group, like the experimental group, at first visit, the researcher made form for collecting demographic information and other necessary information was filled out as the criteria for participation in the project. The intensity of the child's distress was implemented 3-5 minutes after the action in the first appointment, with CHEOPS behavioral observation scale instrument as the pretest. At next visit, the scale was implemented as the posttest, without any type of intervention (the manual of notification and preparation of children through drawings and stories related to medical practice and watching TV cartoons). In the medical center of Bou Ali and Amir Kola, in both experimental and control groups, an hour before doing LP / IT by the assistant director, EMLA local anesthetic cream and in case of the lack of access to it, xylogel containing two percent lidocaine was applied on the position of the needle insertion. In the end, all the children were given a small prize.

In Bou Ali and Amir Kola hospitals, the researcher personally provided these conditions so the children in both centers should be placed under similar standard care.

Findings

For research data, mean and standard deviation etc. are used in the data description sector and covariance analysis test in the deductive sector. In this study, children between 8 and 12 participated of whom 30 were selected as samples. Relative frequency distribution under study revealed that the average age of children was 10 years and the minimum age 8 and maximum age 12. The subjects of the experimental and control groups each consisted of 15 people.

Table 1) Descriptive data scores of distress level on pretest and posttest

Variable	Pretest		Posttest	
	Mean	Standard Deviation	Mean	Standard Deviation
Experimental group	11.44	1.13	6.77	0.833
Control group	11.00	0.833	11.55	0.726

Based on the results obtained from table 1, the average of the two control and experimental groups does not have much difference in the pretest stage yet, in the posttest stage, a significant change has been made in the distress level variable score compared with the pretest stage and also compared with the posttest of the control group.

Table 2) Descriptive data on quality of life scores in pretest and posttest

Variable		Pretest		Posttest	
		Mean	Standard Deviation	Mean	Standard Deviation
Problem solution	Experimental group	29.55	2.55	37.33	2.91
	Control group	27.66	2.34	26.66	2.59

According to the results in table 2 obtained from descriptive indices, it can be stated that the mean of the two experimental and control groups does not have much difference in the pretest stage yet in the posttest stage, a significant change has been made in the quality of life variable score compared with the pretest stage and also compared with the posttest of the control group.

Table 3) evaluation of normality of data distribution using Shapiro Wilk test

Variable		Shapiro Wilk test			
		rate	Degree of Freedom	Level of Significance	
Variable	Quality of Life	experiment	0.779	9	0.312
		control	0.924	9	0.423
	Distress	experiment	0.899	9	0.248
		control	0.823	9	0.087

Based on the results in table 3 obtained from the smirnov kolmogorov test, since the values achieved for these tests in the two groups is not significant at the 0.05 level; therefore, this condition of equality of intragroup variances and also the distribution of data normality exists.

Table 4) Levine test results to check the variance homogeneity of scores of intragroup subjects (n=15)

Variable	F	df1	df2	Sig.
Quality of Life	3.621	1	16	0.075
Distress Level	0.303	1	16	0.589

Based on table 4, the hypothesis of the variance homogeneity of pretest scores of the two groups was evaluated using Levine test and due to the fact that the F Levine volume was not significant at $\alpha=0.05$ level, thus, the hypothesis of data variance homogeneity and establishing a regression slope is in place.

The first hypothesis: cognitive interventions affect the distress level of children suffering from cancer.

Table 5) results of covariance analysis on the first hypothesis (N=15)

Source Index of Changes	Total Squares	Degrees of Freedom	Mean Square	F	Level of Significance	ETA coefficients	Power of the Test
Diffraction Effect	1512.500	1	1512.500	2475.000	0.000	0.994	1.000
Group Effect	102.722	1	102.722	168.091	0.000	0.913	1.000
Error	9.778	16	0.611				
Corrected Total	1625.000	18					

According to the table 5 data, the volume $F=168.091$ with the degrees of freedom (1 and 16) is significant at $\alpha=0.05$ level. Therefore, it can be concluded that cognitive interventions affect the distress level of children suffering from cancer. The ETA amount indicates that the effect of cognitive interventions on the distress level of children with cancer is 91.3 percent. The power of the test with

the volume 1 is indicative of the adequacy of statistical samples under study. As a consequence, the research hypothesis is verified with 95%. And comparing the average of the two experimental and control groups reveals that the average of the experimental group has decreased in the posttest stage. As such, it can be thus stated that cognitive interventions are effective on the distress level of children suffering from cancer.

The second hypothesis: cognitive interventions affect the quality of life in children suffering from cancer.

Table 6) results of covariance analysis on the second hypothesis (n=15)

Source Index of Changes	Total Squares	Degrees of Freedom	Mean Square	F	Level of Significance	ETA coefficient s	Power of the Test
Diffraction Effect	18432.000	1	18432.000	2417.311	0.000	0.993	1.000
Group Effect	512.000	1	512.000	67.148	0.000	0.808	1.000
Error	122.000	16	7.625				
Corrected Total	19066.000	18					

According to the table 6 data, the $F=67.148$ volume with the degrees of freedom (1 and 16) is significant at $\alpha=0.05$ level. Thus it can be concluded that cognitive interventions affect the quality of life in children with cancer and the ETA amount indicate that the effect of cognitive interventions on the quality of life in children suffering from cancer is 80.8 percent. The power of the test with the volume 1 is indicative of the adequacy of statistical samples under study. As a consequence, the research hypothesis is verified with 95%. And comparing the average of the two experimental and control groups reveals that the average of the experimental group has increased in the posttest stage. As such, it can be thus stated that cognitive interventions are effective on the quality of life in children suffering from cancer.

Conclusion

The objective of the present study is the evaluation of the effect of cognitive interventions (the manual of notification and preparation of parents, siphoning attention by providing TV cartoons during medical procedures, doing maze and drawing and painting a short story on the sampling of cerebrospinal fluid) on the distress level induced by sampling and injection into the cerebrospinal fluid and the quality of life in children with cancer. Based on the negative effects of distress, during painful medical procedures such as sampling and/or injection into the cerebrospinal fluid, on the ability of useful functioning and the quality level of life in children suffering from cancer, the importance of cognitive interventions on helping to manage distress caused by these measures is detected in children with cancer. In the assessment of the second hypothesis namely that "cognitive interventions affect the distress level of children suffering from cancer," by conducting the covariance analysis statistical method for the element of "distress," this conclusion was achieved that cognitive

interventions have significantly caused reduction in the distress of children suffering from cancer. The results obtained from tables 1 and 5 indicate that applying independent variable i.e. cognitive interventions (the manual of notification and preparation of parents, siphoning attention by providing TV cartoons during medical procedures, doing maze and drawing and painting a short story on the sampling of cerebrospinal fluid) has also had a positive and significant effect on the intensity of worry in children with cancer. The statistical relationship of the cognitive interventions element with the distress level of children at $P=0.05$ was significant. Kazak et al. (1996) compared a behavioral, cognitive and medicinal combinational intervention with a medicinal intervention during invasive measures in the reduction of distress. The results represented that both interventions are effective on the reduction of distress in the child and parent. Powers et al. (1999) taught 4 pre-school children suffering from cancer (3-5 years old) to display certain behavior prior to and during intramuscular and intravenous injection, cognitive coping behaviors. The parents were taught to be their children's instructor throughout the use of coping behaviors. Parents and nurses better evaluate the child's behavior. The results indicated that the parents learned guidance coping behaviors and the children learned specific coping behaviors and the children showed less behavioral distress which was consistent with the results of the present study.

In the assessment of the second hypothesis: cognitive interventions affect the quality of life in children suffering from cancer. Having conducted the covariance analysis statistical method, for the "quality of life" element, this result was obtained that cognitive interventions affect the quality of life in children suffering from cancer.

The findings obtained from tables 2 and 6 reveal that applying the independent variable i.e. cognitive interventions (the manual of notification and preparation of parents, siphoning attention by providing TV cartoons during medical procedures, doing maze and drawing and painting a short story on the sampling of cerebrospinal fluid) was effective on the quality level of life in children with cancer and had a positive significant effect. The statistical relationship of cognitive interventions element with anxiety of children at $\alpha=0.05$ level is significant. In a research, Farrokhnia, Shahidi and Fathabadi (2011) showed that cognitive interventions lead to the reduction of pain, distress and improvement of the quality of life in children with cancer which is consistent with the results of the current study. The improvement of the quality of life in patients suffering from cancer is considered one of the essential therapeutic purposes and most medical decisions are influenced based on their impact on the quality of life (Soni & Cella, 2002). Because of the importance of preparing children and parents for painful medical procedures and giving awareness to parents in order to correct erroneous beliefs regarding pain and therapeutic measures (Greenberg et al., 1999) and more effective and active participation of parents in children's distress management (Polkki et al., 2002), the treatment plan should include the preparation of the patient and family for pain and distress, and the management of both (Hath et al., 2004). Influencing and giving awareness to children increases along with the intervention of siphoning attention throughout painful medical procedures (Jaaniste et al., 2007). In explaining the results obtained from this research hypothesis, the cognitive aspect of the subject can be pointed out. Since in patients with negative compatibility, automatic thoughts are seen a lot and these people deliberately pay attention to the negative aspects of the environment, they may have anxiety and distress and anything that changes their focus of attention may be utilized as a primary coping strategy. Simple methods of siphoning attention, particularly in anxious people, can be useful (Moorey & Greer, 2002). Based on the offered explanations, it seems that coping strategies,

particularly cognitive strategies, by the effect they apply on cognitive, emotional and physiological elements, can preempt negative emotions and distress in painful invasive procedures and reduce distress in children caused by such measures. As was mentioned before, although including quality of life in medical researches is a relatively new subject and its interpretation is varied, the quality of life has increasingly been determined as one of the most substantial parameters which must be measured in the assessment of medical treatments, comprising procedures employed in distress management. As was observed, cognitive interventions in this study can reduce distress induced by such medical procedure in children. Controlling distress and the relevant symptoms can lead to the improvement of the quality of life.

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