

Study of the Effectiveness of the Cognitive Behavioral Therapy on Self Efficacy and Pain among Children Suffering from Cancer

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Abstract

Objective: the aim of the present study is to investigate the effectiveness of the cognitive behavioral therapy on pain reduction and the elevation of self efficacy among children who suffer from cancer.

Method: The present study adopts a quasi experimental pretest-posttest two group design .The research population consists of all 9-11 year old children with cancer who admitted to Tehran specialized cancer treatment centers in 2015. From those eligible in this study 40 were selected at hand and were randomly divided to two experimental and control groups (20 for experimental group and 20 for control group). Kuris self-efficacy questionnaire and Oucher pain scale were employed for data collection and multivariate and single-variant analyses of covariance have been used for data analysis.

Results: The results showed that the cognitive behavioral therapy has resulted in ease of pain and rise of efficacy among the experimental group ($P < 0.01$).

Conclusion: Based on findings it can be deduced that cognitive behavioral therapy has a significant impact on this group of patients and this treatment can be employed as an appropriate solution in order to reduce the symptoms of children with cancer and ultimately to treat cancer.

Keywords: cognitive behavioral therapy, self-efficacy, pain, children with cancer

1. Introduction

Despite considerable medical developments, cancer after cardiovascular disorders is the second cause of mortality in America and the third cause of death of Iranians after cardiovascular diseases and accident (Asvadi Kermani, Ashrafiyan, Zeinali, Imani, & Shabanloo, 2012). Early cancer refers to those cases of cancer that are diagnosed among children under the age of 15 years old (Mirzaie, Yazdy, & Navidi, 2012). Prevalence rate in Europe and America this disease is 129 cases in every one million people (Wilson & Hockenberry, 2013). Moreover, in Iran it is 150 cases in every one million people (Ward, Desantis, Robbins, Kohler, & Jemal, 2014). Epidemiology studies in Iran show that the prevalence of this disease is 15 children in every 100 thousand children (15). And in 2010 in Iran 4% of the children under the age of 5 and 13% of the children between 5-15 have died because of cancer. The prevalence of cancer in both genders before the age of maturity is almost the same and at maturity the ratio between girls and boys increases by 2 to 1 (Hansen, Pourfeizi, & Dastgiri, 2010). The mental influences of cancer diagnosis and the physical influences of its treatment causes extreme tension in the life of the child and disrupts the order of life (Hansen, 2000) side effects such as depression (Larsson, Mattsson, & Von Essen, 2010; Atrifard, M., Zahireidin, A., Dibaei, Sh., & Zahed, 2014), anxiety (Distefano, Riccardi, Capelli, Costantini, Petrillo, & Ricci, 2008), sleep disorders (Michael & Tannok, 2005), reduction of self-esteem and self efficacy (Speyer, Herbinet, Vuillemin, Briancon, & Chastagner, 2010), lack of attention (Krull, Huang, & Gurney, 2010), etc. Generally, the pain and suffering caused by the disease, fear of death, side effects of the disease, and fall of the rate of the performances are among the factors which disrupt the mental health of the children suffering from cancer (Kricher, Price, Butow, Goumas, Armes, & Armstrong, 2009). As mentioned earlier one of the structures which experience loss of functionality and malfunctioning is self-efficacy

(Hosainzadeh, 2001; Kazemi, Sh., & Javid, 2012; Jamshidifar, 2013). Self-efficacy refers to the person's judgment of his abilities to do an action and can enable the person to take health-improving actions and abandon actions harmful for the health (Mazloomi, Mehri, & Morowatisharifabad, 2006). Researches have shown that high self-efficacy in people with cancer causes better adaptation (Northouse, L., Laurel, L., Mood, D., Kershaw, T., Schafenacker, A., & Mellon, 2002), better life style (Manne, Ostroff, Norton, Fox, & Grana, 2006), less stress (Hirai, Suzuki, Tsuneto, Ikenaga, Hosaka, & Kashiwagi, 2002), and less physical symptoms (Collie, Wong, Tilston, Butler, & Turner-Cobb, 2005).

In addition, researches show that pain is one of the most common problems of patients with cancer (Kearney & Richardson, 2006) which causes most of the sufferings in this group of children (Mori, Elsayem, Reddy, Bruera, & Fadul, 2012) and it is observed among 50-70 percent of the patients (Wiese, Löffler, & Vormelker, 2010). This pain is not only under the influence of biochemical factors but can be affected by social and mental factors as well (Modesto-Lowe, V., Girard, L., & Chaplin, 2012). Researches show that in children cancer pain is the sign that children are more afraid of (Wiener, Hersh, & Kazak, 2006). Diagnosis measures such as sampling from the spinal fluid creates high rate of pain, fear, anxiety and emotional distress among children (Favara-Scacco, Smirne, & Schiliro, 2001). Despite the developments in pain relief methods, many of children suffering from cancer tolerate too much pain. The studies revealed that 64% of the children with cancer at the final stage, 59% at the time of treatment and 33% of them after the treatment experience pain (Deandrea, Montanari, Moja, & Apolone, 2008) so that on average in 70% of the cases cancer pain is not sufficiently reduced (Yildirim, Cicek, & Uyar, 2009).

Various treatment methods have been carried out to cure the accompanying signs of the cancer. One of the methods whose effectiveness on accompanying signs of cancer has been confirmed is the cognitive behavioral therapy (Mustaffa, Musa, Abu, & Yusof, 2012; Garland, Johnson, Savard, Gehrman, Perlis, Carlson, & Campbell, 2014; Abrahams, Gielissen, Goedendorp, Berends, Peters, Verhagen, & Knoop, 2015). Cognitive-behavioral treatment is based on changing and challenging irrational thinking methods and behavioral malfunctioning methods. Behavioral cognitive treatment is one of the successful treatments for a vast range of malfunctioning. In this type of treatment, the patient is assisted to diagnose his distorted thinking patterns and deficient behaviors. To be able to change his distorted and deficient thoughts precisely organized behavioral assignments and orderly discussions are implemented. In this method, the behavioral techniques mainly include avoidance methods of stimulant situations or change of response to such stimulants and giving new responses to them. Use of muscular relaxation techniques at extreme anxiety moments instead of using material and providing fresh and apposite reinforcements are other techniques of the treatment. By the use of cognitive techniques, the patient would be able to identify the negative thoughts and try to replace them with apposite ones (Carroll & Rounsaville, 2007). Researches show the efficacy of cognitive behavioral therapy on self-efficacy (Shariati, Izadikhah, Molavi, & Salehi, 2013; Estanelly, Beto, & Deyo, 2012; Keshi, A. K., & Jappa, 2013; Shariati, Izadikhah, Molavi, & Salehi, 2013; Issazadegan, Shiekhly, & Hafeznia, 2015) and pain (Ehde, Dillworth, & Turner, 2014; Rahimian, 2011; Golchin, Janbozorgi, Alipour, & Agah-Heris, 2011; Abdolghaderi, Kafee, Saberi, & Aryapouran, 2014).

Since children are the future makers of the country and their livelihood guarantees the future of the society and given the importance of curing the accompanying signs and disorders of cancer no research has focused on the efficacy of behavioral cognitive treatment on reducing the pain and increasing the self efficacy of the children with cancer. Therefore, the present study is an attempt to answer the question does behavioral cognitive treatment has a significant influence on the self-efficacy and pain of the children with cancer.

2. Methodology

The present study is quasi-experimental and follows a two-group pretest posttest design. The statistical population of the present study consists of all 9-11 year old children with cancer attending Tehran specialized treatment centers in 2015. Since in experimental researches the least mass of sample has been considered at 15 participants (Delavar, 2010) but in order to increase external reliability 40 eligible individuals at hand were assigned into two groups of experimental and control (20 for the experimental group and 20 for the control group). Moreover, the criteria for inclusion in this study comprised the age range of 9 to 11 years, surviving at least one year from the initial cancer diagnosis, having pain and the written subscription of parents for entering the study.

2.1 Research Instruments

2.1.1 Oucher's Pain Measurement Scale

Oucher pain measurement scale was arranged by Bier in 1984 to analyze the rate of pain in 3-12 children. This

scale is in poster form and consists of two scales one numerical scale 0-10 or 0-100 for older children (5plus) and a pictorial scale with 6 pictures to the right and numbers 0-10 to the left of the pictures for younger children (Wilson & Hockenberry, 2008; Ward et al., 2014; Sajjadi, Roshanfekr, Asangari, Zeinali Maraghe, Gharai, & Torabi, 2011). In numerical scale of 0-10 the number the child points to shows the pain score. If pictorial scale is used the picture pointed to should be converted into the corresponding number to even numbers ranging from 0-10. Validity of this scale by Kendall synchrony coefficient 0.65 and pictorial scale reliability 0.912 and the reliability of the numerical scales have been reported at 0.984 (Beyer, Villarruel, & Denyes, 2009). It's worth mentioning that Numerical Rating Scale was used to assess the severity of pain in this study.

2.1.2 Self-Efficacy Scale

Morris prepared this scale in 2001 to measure the self-efficacy of children and teenagers 7-18. This scale consists of 24 items that respondents answer to them with a five-degree scale to them (very bad to very good). Three educational, social, and emotional scales assess this self-efficacy questionnaire. Alpha coefficient of the self-efficacy questionnaire was obtained at 0.88. Coefficient correlation between this questionnaire and Ladd and Wheeler Children efficacy questionnaire was obtained at (0.40) ($p < 0.01$) (48).

2.2 Data Collection

After obtaining the required licenses and referring to the medical centers from children between 9-11 years old with cancer, 40 patients were selected at hand and they were assigned into two experimental (20 participants) and control groups (Northouse et al., 2002). Then the parents were updated in terms of the rationale of the treatment and the purpose of the research and they filled the form of testimony of treatment. They were also assured that their information would be kept confidential. At the next stage, the research questionnaires were administered as the pre-test to measure the dependent variables. After that, the experimental group participants signed a contract to attend the treatment sessions. In the next step, which is the pre-test, other self-efficacy demographic characteristics questionnaire have been implicated at the first session to measure the dependent variables.

8 sessions of group treatment once a week and every session for 60 minutes were conducted by the author. And at the end of the final session, in order to measure the dependent variables the post test stage was administered. It is also worth noting that the pretest and posttest in control group, were administered at the same time and the same day with the experimental group.

At the end, the obtained data from the pretest and posttest by the use of SPSS-19 software and MANCOVA multi-variable covariance analysis test and single-variable covariance analysis of ANCOVA were analyzed and investigated.

2.3 Interference Method

Table 1. Content of cognitive behavioral therapy sessions on self-efficacy and pain

Session	Session content
1	Other questionnaire of demographic characteristics, self-efficacy scale were placed to the subjects and it disused the three systems of thought, behavior and physiology were discussed.
2	Describing tension cycle-pain-assessment. Identifying deficient approaches of control and realizing their deficiency. Accepting personal events without struggling with them by the use of allegory receiving feedback and presenting assignments.
3	Introducing the concept of assessment and description by the use of allegory change of language concepts by the use of allegory teaching relation, receiving feedback and presenting assignments.
4	Opposing with automatic thoughts and supplanting them with apposite rationale. Identifying special mediating beliefs and the pain related cores.
5	Adding confronting self-talk exercise and self-talk self-education.
6	Educating new mental assessment and the related challenges as a solution to change irrational thoughts.
7	Teaching problem solving method, social relations and interpersonal relations and the role of physical activities to increase self control feeling.
8	Analysis of the development and the fulfillment of the participants' goals, teaching how to make use of the learning in real life, analysis of the unfinished tasks of the participants, study of the feelings of the participants about the end of the sessions, conducting post –test.

3. Results

Monographic findings of the research showed that 55% of the experimental groups (11 people) were boy and 45% (9 people) were girl, 30% (6 people) were third grade, 45% (9 people) were fourth grade and 25% were fifth grade. In control group 50% (10 people) were boy and 50% (10 people) were girl, 40% (8 people) were third grade, 35% (7 people) were fourth grade and 25% (5 people) were fifth grade.

As can be observed at Table 2 the mean and standard deviation variables are presented.

Table 2. Mean and standard deviation of self-efficacy and pain factors at control and experimental groups

		Examination Group		Control group	
		Mean	Standard deviation	Mean	Standard deviation
Educational self-efficacy	Pretest	87.18	86.3	94.16	30.5
	Posttest	31.22	67.4	06.18	56.4
Social self-efficacy	Pretest	75.15	82.3	94.16	35.2
	Posttest	31.21	06.4	53.18	45.2
Emotional self-efficacy	Pretest	69.15	24.3	23.16	72.2
	Posttest	75.20	62.2	47.18	21.2
Total score self-efficacy	Pretest	31.50	59.8	11.50	72.6
	Posttest	37.64	74.8	06.55	95.6
Pain	Pretest	60.4	21.3	80.4	70.3
	Posttest	40.2	94.3	70.4	09.2

Before the application of covariance analysis parametric test to determine the cognitive behavioral therapy on self-efficacy, variance congruity presumption was analyzed by Luvin test. The results of the variance homogeneity presumption at the variables under the study were approved in both groups. This test was not significant for any of the variables and as a result, the use of parametric tests was considered permitted. To analyze the homogeneity of the variance presumption Mbox test was employed and the results showed that the amount of the box is not significant and the indifference presumption of variables exist between the variances ($P=0.82$, $F=0.63$, $BOX=8.31$). Wilks Lambda test results $P=0.0001$, $F=19.95$) also permit the use of multiple variable covariance analysis. These results show that among the experimental and control group there is a significant relationship at least between one of the dependent variables.

Table 3. Multi variable covariance analysis significance test results on self-efficacy in experimental and control group

Self-efficacy	SS	Df	MS	F	P
Educational	04.351	1	52.175	92.38	0.001
Social	004.475	1	50.237	26.92	0.001
Emotional	97.109	1	98.54	89.26	0.001

The results of table 3 show that there is a significant difference between the mean of scores of educational self-efficacy ($F=38.92$), social self-efficacy ($F=92.26$) and emotional self-efficacy ($F=26.89$) between two experimental and control groups ($P<0.001$). In other words cognitive behavioral therapy has improved social, educational and emotional self-efficacy at posttest stage among experimental group. Before the application of covariance analysis parametric test to determine the cognitive behavioral therapy on pain, variance congruity presumption was analyzed by Luvin test. On the basis of the results the variance homogeneity presumption at the variables under the study were approved in both groups. This test was not significant for any of the variables and as a result, the use of parametric tests was considered permitted.

Table 4 single variable covariance analysis test to determine the efficacy of cognitive behavioral therapy on pain

Source of changes	SS	Df	MS	F	P
The influence of interference	395.210	1	395.210	6.583	0.037
The influence of pretest	401.572	1	402.572	6.502	0.038
Error	433.428	37	61.918		
Total	63685.000	40			

As can be seen a Table 4 pain after the pretest impact control with ($F=6.583$) is at ($P<0.05$) significance level. The aforementioned findings show that cognitive behavioral therapy as an interference program has been efficient at improving pain at experimental group.

4. Discussion and Conclusion

The purpose of the present study was to investigate the effectiveness of cognitive behavioral therapy on self-efficacy and pain among the children suffering from cancer. The research findings showed that cognitive behavioral therapy leads to the improvement of self-efficacy (educational, social and emotional) among the experimental group. This finding is commensurate with some of the researches which showed that cognitive behavioral therapy improves self-efficacy (Kumar & Sebastian, 2011; Estanely, Beto, & Deyo, 2012; Keshi & Jappa, 2013; Shariati, Izadikhah, Molavi, & Salehi, 2013; Issazadegan, Shiekhy, & Hafeznia, 2015). To explain the effectiveness of cognitive behavioral therapy to improve educational self-efficacy, it must be noted that cognitive behavioral therapy provides the student with the required ability to confront them via precise training an observing educational procedures. The received feedback from others about the person's abilities to perform educational assignments can enhance the educational self-efficacy of the person and influence the abilities of the person in terms of educational assignments, control and dominance over them. And since this treatment originates from cognitive, emotional and social evolution by activating cognitive functions the willingness of the person to engage at educational activities increases. On the one hand the educational development leads to the activation of self-efficacy and as a result another source of educational self-efficacy gets activated and consequently improves the educational self-efficacy beliefs. In proportion to the rise of awareness and cognition the person gets a better understanding of himself and his behavior. This cognizance enhancement naturally leads to the rise of the behavior in case it is apposite and fall in case it is inapposite, as a matter of fact this education causes the person find out the relationship between behavior and the possible outcomes of that behavior and as a result select behaviors and do them which bring about positive results (50). In fact cancer diagnosis in children with cancer confronts them with limitations and demerits which grow even more intense as they enter school where they need attention and support, and other consequences will follow. According to this fact, regarding the critical role of attention and support in academic performance and self-efficiency of children with cancer, applying the treatment methods enhances the understanding of the environment, increases adaptability to different situations, and consequently improves academic performance and self-efficiency. To explain the effectiveness of this treatment in increasing social self-efficacy it can be stated that use of various treatment techniques in cognitive behavioral therapy leads to the improvement of self-confidence and creates self-respect and self-control in student which would bring about social support for the student. Use of apposite mental systems assists the children with cancer to confront the stressful events. The ability to solve social problems efficiently is in relation with optimal adaptation of the person and causes the internal control preservation which would in respect help the student solve various issues and life issues and accepting the responsibility of behaviors in line with solving the problems. In fact it makes student make use of communicational methods which enable him to preserve his self-esteem and follow his self-satisfaction and competence defend his rights and personal atmosphere without abusing others. Also, according to Bandura's social-cognitive theory (Beyer, Villarruel, & Denyes, 2009) it can be noted that the most appropriate and beneficial method for substantiating the systematic experiences is the one in which the person is directly involved in controlling his own behavior and environmental stimuli and achieves behavioral self control using orders obtained from the principles of cognitive behavioral therapy which increase social self-efficiency. Finally cognitive behavioral therapy by implementing approaches to confront unpleasant emotions enable the person to identify emotions in him and others, know the way emotions impact the behavior and can show apposite reactions to various emotions and improve his emotional self-efficacy. This method assists the patient to make use of a set efficient cognitive skill to cope with emotional and problematic moments. Various cognitive behavioral techniques enable the person takes steps in solving the problems on the basis of the earlier practical experiences and mental abilities. As a result this

emotional self-efficacy and management leads to more flexibility of thoughts and creating positive thoughts and make them look at problems as challenges not threats. Generally, this flexibility of thoughts makes the person successful at adjusting negative feelings.

Similarly the results showed that cognitive behavioral therapy is effective at reducing the pain of children with cancer. This finding is in line with the results of the studies which showed that cognitive behavioral therapy leads to the improvement of pain (Ehde et al., 2014; Rahimian, 2011; Golchin et al., 2011; Abdolghaderi et al., 2014). However, the studies show that patients with cancer and their families lack the sufficient knowledge regarding pain control which causes fear and stress for patients and their caregivers and prohibits adequate care. Researchers believe that training programs improve the knowledge and correct the wrong ideas regarding pain control in patients with cancer, and cognitive behavioral therapy is one of the most common methods. Regarding the effectiveness of this treatment on pain control it can be claimed that the aim of cognitive behavioral therapy approach is helping patients to achieve a new concept of his pain in the first place and gaining control over it. In cognitive behavioral therapy the attempts are made to identify irrational and deficient thoughts which stimulate the signs of disease, including pain, and the patient understand their role in relationship with the disease and replace them with more accurate thoughts and since the presence of pain leads to negative disposition and distress of the patient during the treatment this view is instilled to the patient that they have disastrous and inaccurate view of the treatment of the disease which makes them take a negative and stressful vantage point of the disease and the process of recuperation. To this end by the use of cognitive reconstruction techniques it is trained to the patient to identify the deficient and negative thoughts about the pain and challenge them and replace them with positive thoughts. Many of the cognitive errors such as disastrous, feeling of no control over pain, and lack of efficacy in pain control are caused by automatic negative thoughts. Therefore, by the use of this technique patients obtain mental clam and further control over pain. Active confronting approaches such as proceeding performing tasks despite the pain by learning the relation cycle, activity programming technique, and use of the distraction approach, and supplanting passive confronting approaches such as depending on others to control the pain and limiting the activities (Gatchel & Rollings, 2008).

As a general conclusion it can be stated that since many of the signs and symptoms of those suffering from cancer are related to cognitive processes and social and cultural conditions but the evidences show that the negative impact of them is not limited only to the person because some of these disorders have extreme functional impacts that in addition to the person trouble the community as well as family for the same reason the common belief is that to treat these signs and disorders accompanying cancer eclectic treatments need to be employed. Therefore, cognitive behavioral therapy by being combined with cognitive, behavioral and emotional principles have a significant role in the way the person copes with cancer and reduce pain and increase self-efficacy.

Any research is faced with limitations to reach achievements which should be considered. The present research sample was limited to 9-11 year old children in Tehran which influences the generalization of the research findings to some extent. And the same rater and trainer, investigating all types of cancer and lack of classifying them and no follow-up period are among the limitations of the present study. As delimitation it is suggested to administer this research in other regions and compare the findings. Similarly it is suggested to conduct the interference stage by a different person and determine the type of cancer and include the follow-up period to the future researches.

Competing Interests Statement

The authors declare that there is no conflict of interests regarding the publication of this paper.

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