

Comparison the Effectiveness of Cognitive-Behavioral Therapy of Pain Management and its Computerized Version on Reduction of Pain Intensity and depression in Children with Cancer

Research Article

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Abstract

Background: Cancer is one of the medical problems that have been associated with pain. Moreover, the pain combined by negative emotions such as anxiety, depression and anger. Nowadays, computers are available in all over the world and computerized psychological interventions can reduce negative emotions such as psychological interventions.

Objectives: In this study, we examined the effectiveness of cognitive-behavior therapy of pain management and its computerized version on reduction of pain intensity and depression in children with cancer.

Methods: The research method was a pre and post-test with a control group. Two psychological interventions (cognitive behavioral therapy of pain management and its computerized version) were compared with the control group. The sample consisted of 60 children aged 8 to 12 years old with different types of cancer in Shafa hospital in Ahwaz. According to the including and excluding criteria, 60 subjects were selected. Then, randomly, 45 subjects were selected and randomly assigned 15 children in each group. All three groups received medical treatment as usual until the end of study but two experimental group received psychological interventions as complementary treatment and after the study finished control group receive the computerized version. The research instruments included Beck Depression Inventory (BDI) and International Pain Measurement Scale. The first experimental group received 6 sessions of cognitive-behavioral therapy for 6 weeks, and the second group was subjected to a computerized version of cognitive-behavioral therapy of pain management for 6 weeks, but the control group did not receive any interventions. For ethical considerations, a version of computerized cognitive-behavioral therapy was provided to them. After 6 weeks, all three groups were evaluated as post-test.

Results: The results showed that there was a significant difference between the two experimental groups and control group in depression and pain ($P < 0.0001$), the rate of depression and pain in experimental groups significantly decreased in comparison with pre-test and the control group. Also, the rate of pain in computerized version of cognitive behavioral therapy of pain management group significantly decreased more than in comparison with cognitive behavioral therapy of pain management, but there was no significant difference between CBT and c CBT in the rate of depression.

Conclusions: According to these results, using computerized version of cognitive behavioral therapy is recommended for cancer children beside other medical therapeutic methods.



Keywords: Cognitive-Behavioral Therapy of Pain Management, Computerized Version, Pain, Depression, Cancer

Background

Since last decade, the epidemiology of pain in children has been focused. Childhood pain is important because of not only the challenges in routine people's lives but also its effects in the future. For instance, in their adolescence, children with abdominal pain are at increased risks of somatic symptoms, mental disorders, and hospital admissions for unexplained medical symptoms [1]. Children with cancer often suffer from pain due to the activity of the disease or its treatment. Estimating the prevalence of pain in these children between 25% and 50% depends on the stage of the disease and the cause of the pain [2]. Cognitive-Behavioral Therapies (CBT) have been effective for many chronic pain difficulties [3,4].

Significant portions of children who are in hospital receive inadequate assessment and management of pain [5]. This especially occurs in the context of procedural pain [6]. Experience pain more than moderate intensity, in children is associated with short-term and long-term adverse physiological and psychological effects. Uncontrolled pain in newborns can change the process of pain, and perception can affect physiological, social and neurocognitive development outcomes. In contrast, effective pain control strategies are associated with faster and more complete recoveries and cost reductions to the health care system [7]. Despite the dramatic growth of therapeutic research, solution-based intervention based on evidence of effective tools for pain assessment, guidelines, pain management practice in hospitalized children still remains a concern [8].

CBT is one of the most popular chronic pain treatments and is an effective and generous treatment for many psychiatric disorders, such as depression and anxiety [9]. It is proved that CBT is an acceptable intervention for pain sufferers. CBT designed to reduce pain, distress and disability have been introduced since more than 40 years ago; they are now commonly used treatments for depression, anxiety disorders and chronic pain [9].

The pain experience in cancer is widely recognized as a major threat to the quality of life; relief of pain is a priority in oncology care. As much as the disease progresses, it is necessary that pain treatment flows at different levels from the onset of the disease to the long-term conditions, even for those who are in the final stages of life [10]. Because of the wide effect of children's cancer on how they and their families suffer from it, a computer program is designed which helps children in coping more effectively with these circumstances. Because of some limitations in the availability of psychological services for these individuals, c CBT may be a good alternative for conventional CBT and will provide them with more accessibility. Therefore, in this study, we examined the effectiveness of CBT of pain management and its computerized version on reduction of pain intensity and depression in children with cancer.

Objectives

The method in this study is "Randomized Controlled Clinical Trial". The population of this study included all cancer patients who referred to Ahvaz Shafa Hospital from the beginning of October of 2018 to the end of December 2018.

Methods

The method in this study was "Randomized Controlled Clinical Trial". The inclusion criteria were considered in this study: they suffered from one type of cancer, their age ranged from 9 to 12 years, they were literate, and they were fluent in Persian and exclusion criteria were: having developmental psychiatric disorder, autism spectrum disorders (to the diagnosis of a psychiatrist), individuals had a history of seizure. At first, individuals willing to participate in the study

were randomly (using the lottery method) assigned to three groups (i.e., Cognitive- Behavior Therapy of pain management (CBT), Computerized Cognitive- Behavior Therapy of pain management (CCBT) and control group. Both interventions (CBT and c CBT) performed as individual psychotherapy sessions. According to other studies that applied in controlling negative psychological effects of cancer, we estimate sample size [11].

The study's goals described to the participants, and we take written consents of child's parents. To ensure the presence of the participants, the selected individuals completed an agreement including the number of sessions and the estimated duration. All three groups received medical treatment as usual until the end of study but two experimental group received psychological interventions as complementary treatment and after the study finished control group received the CCBT.

CBT group participate in six psychological 45-minute sessions (session1: introduce program of session, psycho education about cancer, session2: relaxation-training, session3: negative thought control, session4: behavioral activation and self-rewarding, session5: anger control techniques, session6: physical activation and goal setting). In CCBT group, they receive one guidebook (included parents section, homework) and the compact disk that included all six CBT session's contents. Psycho education and training take place via texts, animations, games. After the end of the sessions in the sixth week, the participants were re-evaluated. The therapeutic package was designed based on the articles [7-11] in this area and the content of the pain control book [12]. Three clinical psychology experts confirmed the content validity of this package. (Supplementary information about the design and implementation of these two methods of intervention is being published in a separate study).

Research Instruments

Wong and Baker's Face Scale

Children are able to describe their pain qualitatively through language which reflects their experience, and gradually calibrate their pain by applying different scales [13,14]. This scale designed by Wong and Baker in 1998, consists of faces and numbers scale. The face consists of six pictures of the child's face, each showing a different amount of pain. The left-hand side of the scale represents the absence of pain and the right image indicates the most severe pain. Numerically, number 1 means no pain, 1-2 indicates pain, 3-4 indicates slightly more pain, 6-5 represents much more pain, 8-7 shows severe pain and 10-9 represents the most severe pain. The validity and reliability of this scale have been confirmed in numerous studies [15]. Persian version of this scale has also been used in numerous studies [9]. In the Nick Fried study, the reported correlation coefficient was 82% [10].

Children's Depression Scale CDs

This questionnaire designed by Janbozorgi consists of 21 materials in 13 axes. This is the only Iranian questionnaire which is based on DSM. Scoring is based on the Likert method, from 0 to 4 for axis 1 to 12 and for axis 13 is 0 and 1. To obtain a total score, the scores in the 13th axis were summed up and divided by 9, and then the score of the other axes sum with the resulting number of 13th axes. In this questionnaire, a score higher than 9 is a sign of severe depression. This questionnaire was used in a study consisting of the sample of 1551 children and adolescents in Tehran, and Cronbach's alpha coefficient of 0.84 was obtained [12].

Results

In this study, multivariate analysis of covariance was used to examine the significance of the difference between the mean scores of the experimental and control groups.

Table 1 reports the mean and standard deviation of the variables in



the pre-test and post-test phases. In addition, multivariate covariance analysis used to examine differences between three groups. The results of this analysis are presented in the following table.

The results of Table 2 show that there was a significant difference between the experimental and control groups in depression and pain ($p < 0.0001$). In other words, cognitive-behavioral therapy of pain management and its computerized version had been able to reduce the depression and pain in the post-test.

In addition, in order to investigate if CBT and its computerized version differ in the severity of pain and depression in children with cancer, a series of t-tests were used. The tests compared pre-test and post-test differential scores in two intervention groups; the results are reported in Table 3.

As the table 3 shows, the two methods of intervention used in this study did not differ significantly in the dependent. However, there was a significant difference between CBT and CCBT in pain. The rate of pain significantly decreased in CCBT more than CBT ($P < 0.0001$).

Table 1: Mean and standard deviation of the variables in the pre-test and post-test stages.

Variables	level	N	Mean			SD		
			CBT	CCBT	Control	CBT	CCBT	Control
Depression	Pre-test	45	18.07	16.20	15.93	7.360	4.329	5.574
	Post- test	45	8.60	10.93	16.27	5.962	3.011	5.637
Pain	Pre-test	45	9.40	11.73	10.80	1.595	1.860	1.656
	Post-test	45	5.60	4.33	9.60	0.828	0.817	1.454

Table 2: The results of analysis of covariance in the MANCOVA test on the mean post-test scores of the variables (internal and comparative in the test and control group).

Source	Variables	Observed Power	df	Type III Sum of Squares	Mean Square	F	Sig.	Partial Eta Squared
Pretest	depression	1	1	544.509	544.509	129.642	0.0001	0.77
	pain	1	1	24.485	24.485	45.79	0.0001	0.55
Group	depression	1	1	404.005	202.002	48.095	0.0001	0.72
	pain	0.97	1	10.110	5.055	9.453	0.0001	0.33

Table 3: The comparison of pre-test and post-test differential scores in research variables.

		Mean	SD	T	df	Sig
Depression	CBT	6.47	15.07	1.057	28	0.300
	CCBT	5.27	8.60			
Pain	CBT	0.80	6.40	-1.230	28	0.029
	CCBT	3.40	5.60			

Discussion

Cognitive-behavioral therapies of pain management are among the most well-known methods for treating chronic pain and many psychological disorders, such as anxiety and depression [16]. The underlying principles in cognitive-behavioral therapy are helping the patient understand how cognition and behavior affect the experience of illness, and teaching coping skills and cognitive restructuring. Therefore, along with all the efforts made to get rid of the negative effects of cancer. A study was conducted to compare the effect of thought distraction and to touch on the severity of pain among 5-10 children. There were two intervention groups and one control group (common pain control methods). There was no significant difference between the intervention groups, but both groups had significantly lower pain intensity than the control group [11]. Several studies have also shown that deviation of thought during intravenous injection

reduces the behavioral responses of pain, physiological indices and severity of pain [17].

By summarizing the studies, there are few interventions associated with pain control and other problems associated with the experience of cancer. In the study of the barriers to implementation of non-pharmacological methods of pain control in children and the

strategies provided by nurses, the main reason for not implementing such interventions is mentioned as the shortage of personnel employed in hospitals [12]. In fact, shortage service in managing negative effect of cancer in children is obvious. Furthermore, in the findings of this study, it is stated that therapeutic intervention had a significant efficacy on cancer negative effect reduction in children. Moreover, there was not any significant difference between the two forms of this intervention. This means that computerized CBT can be used as an effective intervention where psychological interventions



are not available. In our study's interventions, different aspects of pain negative effects on children were focused. Thus, different skills via psycho education, such as pain evaluation, behavioral activation, problem solving, relaxation, attention fraction, imagination techniques, and anger control were taught. The advantage of the present study therapeutic program is briefed sessions but wide area coverage. In addition, if this program delivered by CD, the other advantages are accessibility and low cost. The findings of this study can provide better Battle against cancer in the suffering people.

Conclusions

In conclusion, research literature on pain treatment suggests that an effective pain management program should target different dimensions of pain experience [18]. It is imperative that experts pay more attention to psychological aspects of cancer. systematic interventions focusing on the negative psychological aspects of cancer should be designed and implemented as necessary part of treatment for individuals with special medical conditions, such as cancer. With respect to the result of this study that CBT and CCBT did not differ significantly in terms of the changes made in the psychological aspects. We can extend use CCBT for help children who had cancer. And It is essential to provide conditions for further studies and further action to apply CCBT. It is hoped that specialists and officials will pay more attention to children with cancer. Lack of accessibility to psychological services is a common problem for majority if people who needs it especially in childhood area. So it will be desirable if more attempt take place for extend use of technology in other age and other problems. This study can be the first step of the using technology in the psychological interventions we suggest more fundamental trails for presentation CCBT in general population and experts [19,20].

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Footnotes

Author's Contribution

Study concept and design: Najmeh Hamid, and Vajihed Hamedy. Acquisition of data: Vajihed Hamedy, Najmeh Hamid, and Kiomars Bashlideh. Analysis and interpretation of data: Vajihed Hamedy. Drafting of the manuscript: Vajihed Hamedy and Najmeh Hamid. Critical revision of the manuscript for important intellectual content: Najmeh Hamid. Statistical analysis: Vajihed Hamedy and Kiomars Bashlideh. Acquisition of data: Vajihed Hamedy, and Najmeh Hamid, and Administrative, technical, and material support: Vajihed Hamedy, and Najmeh Hamid. Study supervision: Najmeh Hamid, Kiomars Bashlideh, and Seyed Ali Marashy.

Conflict of Interests

We have no conflict of interest to declare

Ethical Approval

The research was granted by the Ahvaz Shafa Hospital, Research Center of Ahvaz Jundishapur University of Medical Sciences Ahvaz, Iran. The code of ethics for this research project, which is related to the doctoral dissertation, includes IR.AJUMS.REC.1396.820.

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