

# DIFFERENTIAL EFFECTIVENESS OF COGNITIVE BEHAVIOR THERAPY AND PSYCHO EDUCATION THERAPY ON KHAT CHEWING BEHAVIOR AND ASSOCIATED MENTAL HEALTH PROBLEMS

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Date Received:

January 15, 2019

Date Revised:

October 07, 2019

Date Accepted:

October 15, 2019

## ABSTRACT

**Objective:** To compare the differential effectiveness of Cognitive Behavior Therapy (CBT) and Psycho-Education Therapy (PET) on minimizing Khat chewing behavior and associated mental health problems.

**Methodology:** A randomized controlled trial was conducted on 40 regular Khat consumer men selected through consecutive sampling technique. The participants were randomly allocated to either CBT group or Psycho-education group by lottery method. The CBT group received seven sessions of manualized CBT for substance abuse and the psycho-education group received three sessions on addiction-related educations. Both therapies were carried out in group format. Depression and Anxiety Stress Scale (DASS) was used for assessing both groups before and after the administration of the therapies. Chi square and t-test were used to calculate the difference between the groups.

**Results:** The age of participants of CBT and PET groups ranged from 18-25 years (mean  $22.15 \pm 2.32$  and  $22.30 \pm 2.20$  years respectively). A significant decrease was found in the Khat chewing behavior in CBT group as compared to the psycho-education group. Similarly, other mental health problems in the CBT group were significantly reduced.

**Conclusion:** CBT was effective in decreasing Khat chewing behavior and associated mental health problems.

**Key Words:** Cognitive behavior therapy, Psycho education therapy, Khat use, Mental health

This article may be cited as: Daud AH, Saleem S, Mahmood Z. Differential effectiveness of cognitive behavior therapy and psycho education therapy on Khat chewing behavior and associated mental health problems. *J Postgrad Med Inst* 2019; 33(4): 304-9.

## INTRODUCTION

Khat is a young tree whose fresh leaves are chewed for its euphoric effect. It is used in a wide region that extends from East to South Africa and the Arabian Peninsula<sup>1</sup>. It has mild stimulant effect because of the presence of cathinone and its metabolite (cathine and norepinephrine) similar to that of amphetamine but to a lesser extent<sup>2</sup>. Historically people used Khat to decrease hunger and sleep and to boost productivity by enhancing energy<sup>3</sup>. This positive effect is observed with the moderate use of Khat. Its excessive use leads to health consequences such as dental, gastric, liver disorders and cardiovascular diseases<sup>4,5</sup>. The consumption of Khat is also related to the risk of psychiatric problems such as insomnia, irritability, aggression as well as poor appetite and lethargy<sup>6</sup>. Depression, anxiety and stress have also

been reported as adverse effects<sup>7</sup>. In some cases, it is reported that the chewers experience a state of mania or hypomania and different studies linked Khat-induced psychoses to excessive use of Khat<sup>6</sup>.

A dramatic increase in the consumption of Khat has been reported in the recent years in Somalia<sup>8</sup>. Before the civil war in Somalia, Khat was usually chewed once a week or on occasions like weddings, funerals and religious gatherings. Few people chewed Khat and those who did were mostly artists and drivers. As the war and conflict erupted in the country, the social norms that used to regulate the habit of Khat chewing changed fundamentally or no longer existed and most of the Somali men started chewing Khat on daily basis<sup>9</sup>. The widespread availability of Khat, a lot of free and unstructured time and the normalization of chewing Khat among men

led to this marked increase<sup>10</sup>. The consumption of Khat also increased among women and adolescents which was very rare and carried a stigma prior to the war. By now Khat consumption has dramatically increased and has become more of a social phenomena<sup>9</sup>.

The use of cognitive behavior therapy (CBT) for the treatment of substance abuse is effective when used as a single treatment or when used in combination with other therapie<sup>11</sup>. Even though CBT for substance abuse is depicted by different treatment constituents; for instance, developing skills, cognitive and motivational aspects and operant learning techniques, yet some strategies emerge that deal with reinforcing aspects of the substances. CBT for substance abuse can also be applied individually or as a group<sup>12</sup>.

Clinical trials and quantitative reviews support the success of CBT in the management of substance-related problems. A meta-analytic review of CBT for substance abuse containing 34 randomized controlled trials (RCT), with 2340 patients, showed a practical effect of CBT on substance abuse<sup>13</sup>. The most noticeable effect was on the cannabis use, followed by cocaine and opioids with the least effect seen on poly-substance addiction. On the individual level therapies, contingency management of relapse prevention had the best impact<sup>13</sup>. CBT for cocaine dependence resulted in 60% clear toxicology result 52 weeks later<sup>14</sup>.

Khat chewing is a neglected area and little research has been conducted mainly focusing on its impact on physical health<sup>15</sup>. Regarding behavioral and associated problems, there is one randomized control trial that was carried out on small refugees camp in Kenya<sup>8</sup>. There is a need to carry out more studies focusing on the treatment of Khat use and its associated mental health problems, as Khat chewing and mental health problems are highly prevalent in Somalia<sup>16</sup>.

## METHODOLOGY

A randomized controlled trial was carried out on 40 Somali undergraduate students who regularly consumed Khat. Participants were enrolled from university campuses using consecutive sampling. All were motivated to quit the habit. They were randomly divided into 2 groups with lottery method; each having 20 participants.

A matching method was used and the participants of both groups were similar in age, chronicity of Khat use, Khat chewing behavior and types of Khat chewed. Male students who chewed Khat at least once a week and had no history of psychosis were included in the study. Frequency of Khat chewing per-week, duration of Khat chewing per day and type of Khat chewed were taken as variables of Khat chewing behavior.

Mental health problems were measured by using Depression Anxiety Stress Scale-short form (DASS)<sup>17</sup>, a self-reported tool that consists of 21 items; and three subscales (depression, anxiety and stress). The rating of each item is a 4-point likert scale. The internal consistency of subscales was found to be depression .90, anxiety .92, and stress .92. For the three subscales, the test-retest reliability scores were found to be .98. The criterion-related validity for DASS correlated with Beck Anxiety Inventory<sup>18</sup> and Beck Depression Inventory<sup>19</sup> were .84 and .87 respectively.

The study was carried out in Borama, a city in Northern Somalia. All procedures of the study were approved by the Institutional Ethical Committee before data collection. After recruiting the participants, they were informed about the purpose and the benefits of the study and written informed consent was taken from them. A baseline was developed for all participants by testing mental health problems using DASS and Khat chewing behavior. The first group received three sessions on addictive psycho education. They were given a general overview about the processes of addiction, risk factors that increase the chances of dependency and the bio psycho social effect of Khat. Each session lasted 90 minutes. For guidance "Staying sober: A guide for relapse prevention" was used<sup>20</sup>. Three days gap was given between each two sessions and one month after the sessions were done, the group was tested again in the same areas they were tested before the therapy.

The other group received manualized cognitive behavior therapy. The therapy consisted of 7 sessions of group-administered therapy that was approximately 90 minutes and was based on clinical procedures described in a treatment manual for drug addiction<sup>21</sup>. Four treatment groups were made with five participants each and the therapy continued for one month with a 4-day gap between each two sessions. The therapy was administered by a trained clinical psychologist and two facilitators. Fifteen days after the therapy was completed, a test was done again in the same area and pretest and post-test were compared. In the end, the two groups were compared on pretest and post-test for both mental health problems and Khat chewing behavior.

For data analysis SPSS-21 version was used. Age of the participants was calculated by using Mean  $\pm$ SD. Level of education, chronicity of Khat chewing, frequency of Khat sessions per-week, duration of Khat session per-day and type of Khat chewed, were determined and presented as frequency and percentage. Chi-square test was used to compare the two groups for Khat chewing behavior, whereas, t-test was calculated to find the difference between groups on mental health problems before and after the therapy administered. Level of statistical significance was established at  $p < 0.05$ .

## RESULTS

The mean ages of the two groups for CBT and PET were  $22.15 \pm 2.32$  and  $22.30 \pm 2.20$  respectively. The frequency and percentage of CBT group on different levels of education are indicated in Table 1. Frequency and percentage of Khat chewing behavior of CBT group were chewing Khat daily or four times a week, whereas, the PET group were chewing Khat daily. Regarding the chronicity of chewing Khat, CBT group had higher duration (6 years), whereas, the PET had chewed the substance for 4-6 years.

There was significant difference in experiencing mental health problems between CBT and PET group after both groups received their therapy;  $p$  value  $< 0.001$  (Table 2 & Figure 1). The two groups had mild difference in mental health problems before the treatment was administered ( $p$  value 0.038). The PET group showed no change in post test while the CBT group had drastically changed (Table 2). CBT group had significantly low frequency and length of a session of chewing Khat ( $p = 0.020$ ) after receiving the treatment (Table 3). The PET group had similar results for both pre test and post test.

**Table 1: Frequencies and percentage of levels of education and patterns of Khat chewing between CBT group and PET group (n=40)**

Variables		CBT Group (n=20) f (%)	PET Group (n=20) f (%)	Total 40 (100) f (%)
Level of Education	BS-I	3 (15)	6 (30)	9 (22.50)
	BS-II	5 (25)	2 (10)	7 (17.50)
	BS-III	8 (40)	5 (25)	13 (32.50)
	BS-IV	4 (20)	7 (35)	11 (27.5)
Frequency of Chewing Khat	Daily	6 (30)	11 (55)	17 (42.50)
	Four Times a Week	7 (35)	2 (10)	9 (22.50)
	Twice a Week	3 (15)	1 (5)	4 (10.00)
	Once a Week	4 (20)	6 (30)	10 (25.00)
Chronicity of Chewing Khat	Less than 1 year	5 (25)	3 (15)	8 (20.00)
	1-3 years	5 (25)	5 (25)	10 (25.00)
	4-6 years	3 (15)	7 (35)	10 (25.00)
	More than 6 years	7 (35)	5 (25)	12 (30.00)
Hours of Chewing Khat per Day	1-4 hours	5 (25)	3 (15)	8 (20.00)
	5-8 hours	4 (20)	5 (25)	9 (22.50)
	More than 8 hours	11 (55)	12 (60)	23 (57.50)
Type of Khat Chewed	Daba Musbar	2 (10)	3 (15)	5 (12.50)
	Jabis	13 (65)	8 (40)	21 (52.50)
	Dadar	1 (5)	4 (20)	5 (12.50)
	Boondaro	0 (0)	3 (15)	3 (7.50)
	Others	4 (20)	2 (10)	6 (15.00)

**Table 2: Means, standard deviations, t and p-values for comparing CBT group and PET group on the basis of mental health problems of the participants (n=40)**

Variables		CBT Group (n=20)		PET Group (n=20)		t	P Value
		M	SD	M	SD		
Pretest	DASS Total	32.50	5.71	35.80	6.70	1.68	.038
Post-test	DASS Total	18.05	9.57	32.10	6.74	5.37	<.001

**Table 3: Comparison between CBT group and PET group on the basis of patterns of Khat chewing after treatment received**

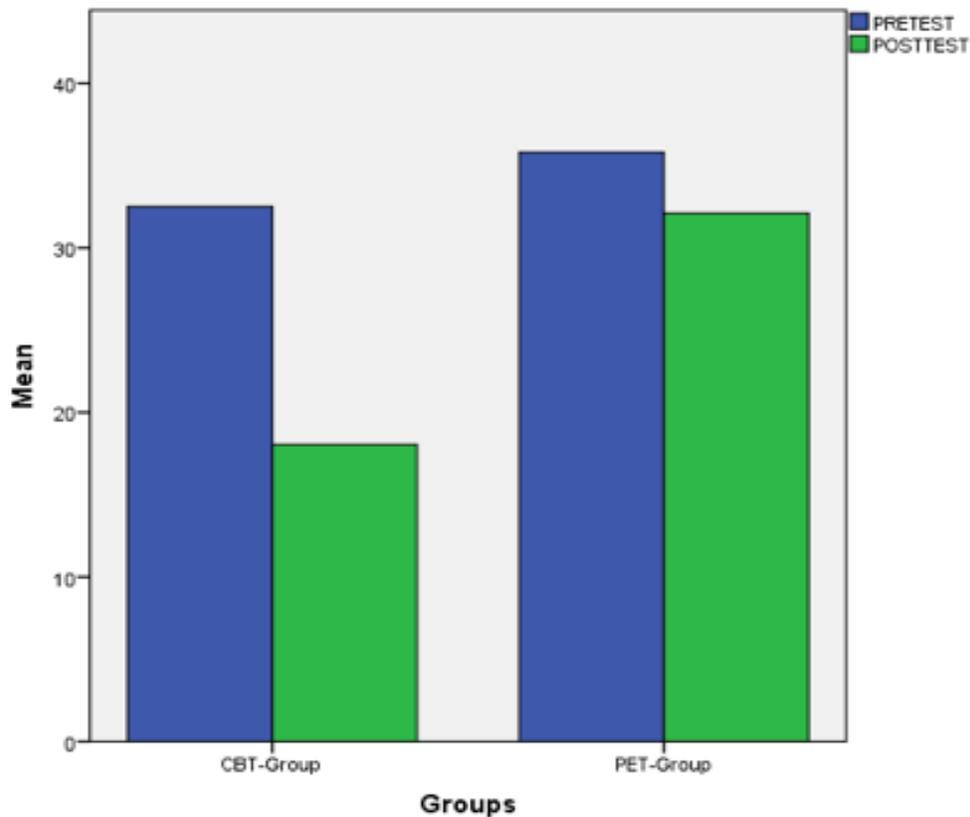
Variables		CBT Group (n=20) f(%)	PET Group (n=20) f(%)	$\chi^2$	P Value
Frequency of Chewing Khat	Daily	1 (5)	11 (55)	13.91	.003
	Four Times a Week	1 (5)	2 (10)		
	Twice a Week	5 (25)	1 (5)		
	Once a Week	13 (65)	6 (30)		
Hours of Chewing Khat per Day	1-4 hours	9 (45)	3 (15)	7.86	.020
	5-8 hours	8 (40)	6 (30)		
	More than 8 hours	3 (15)	11 (55)		
Type of Khat Chewed	Daba Musbar	3 (15)	2 (10)	4.67	.323
	Jabis	14 (70)	10 (50)		
	Dadar	1 (5)	4 (20)		
	Boondaro	0 (0)	2 (10)		
	Others	2 (10)	2 (10)		

## DISCUSSION

The main findings of the study were that CBT group had significantly decreased Khat consumption time such as frequency and hours of Khat. Most of the participants in CBT group were at least chewing Khat four times a week and were chewing 8 or more hours per day. However, after receiving seven sessions of CBT, most of the participants decreased Khat consumption time to once or twice a week and around 4 hours per day. The findings of the current study are in line with the previous literature<sup>22</sup>. Moreover, the post treatment measurement showed that the mental health problems improved significantly for the CBT group. Reduction of Khat consumption time enhances everyday functioning

and improves the sleep cycle, which increment in the individual's physical and emotional well-being by the decline of the impact of Khat and the expansion of self-improvement. Accordingly, the increase in mental health and everyday functioning enables Khat users to concentrate more on employment and other day-to-day activities which serves as prevention or further deterioration of Khat chewing behavior<sup>8</sup>. There is some evidence for the association of substance abuse and mental illnesses. One of these explanations is the self-medication hypothesis which infers that people will select drugs that lighten their particular symptoms of mental illnesses. For instance, a few analysts propose that individuals with a great sense of anger and animosity may pick opiates for these drugs' progressing impacts, while individuals who

**Figure 1: Differences of CBT group and PET group based upon mental health problems before and after the therapy ( $p < 0.001$ )**



are depressed may take cocaine since it thrills and stimulates them<sup>23</sup>. Experiencing depression and post traumatic stress disorder (PTSD) appear to have effect with regards to treatment outcome, for example, decreased Khat use. Among the people with depression and PTSD, the burden of symptoms of mental illnesses are heavier and using Khat enhances mood and distracts from the painful experience<sup>8</sup>. Another explanation is the toxicity hypothesis which believes that mental health problems are the result of the excessive use of drugs, which either directly link e.g. cannabis for psychosis<sup>24</sup> or precipitate and exacerbate the course of the disorder<sup>25</sup>. When it comes to chewing Khat, it is linked to the rising of mental illnesses in Somalia. Both explanations are applicable for the relationship of Khat chewing behavior and mental health problems and it seems that every day functioning is the mediator which is suggested for the future studies to consider<sup>8</sup>.

### LIMITATIONS

Starting with small number of sessions and sample size which necessitates the replications of the study

with larger participants to confirm the outcome of this study. Secondly, the study utilized self-reports measurement for assessing Khat chewing behavior and associated mental health problems, instead of standard clinical interview or other objective measurements like urine or blood tests.

### CONCLUSION

CBT was effective in decreasing Khat chewing behavior and associated mental health problems.

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### CONTRIBUTORS

AHD conceived the idea, designed the study and drafted the manuscript. SS and ZM helped collection of data, analyzed and compiled results, carried out bibliography, critically appraised the draft and did corrections after reviewers' suggestions. All authors contributed significantly to the submitted manuscript.