The effect of Cognitive Behavioral Therapy on Behaviors of Juvenile Delinquents Resident in Correctional Institutions in Alexandria

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Abstract: Juvenile delinquency is a social problem that has grown immensely in scope and depth in the past decade on both national and community level. Innovative interventions need to be implemented to help in reduce juvenile delinquency as Cognitive Behavioral Therapy (CBT) which used to treat behavioral problems or to assist in enhancing existing thinking skills. Therefore the aim of this research was to identify the effect of CBT on juvenile delinquents' behaviors resident in correctional institutions in Alexandria. The present study was carried out in 2 correctional institutions in Alexandria on 40 juvenile delinquents (20 boys, 20 girls). The data were collected using a structured interview schedule and Strengths and Difficulties Questionnaire (SDQ) which was used as pre and post test . The results of the present study showed that CBT was very effective in reducing mental and behavioral problems of juvenile delinquents residents in correctional institutions in Alexandria. It was recommended to shift the approach to juvenile offenders from legalistic to preventive and rehabilitative interventions.

[Faten Fikry; Manal A. S. Oueda; Mervat W. Abo Nazel; Amina Ahmed and Rasha Abed El.Hakim **The effect of Cognitive Behavioral Therapy on Behaviors of Juvenile Delinquents Resident in Correctional Institutions in Alexandria**. Journal of American Science 2012;8(2):255-264]. (ISSN: 1545-1003). http://www.americanscience.org. 39

Keyword: Cognitive, Behavioral, Therapy, Juvenile Delinquents, Correctional Institutions

1. Introduction

Juvenile delinquency is a social problem that has grown immensely in scope and depth in the past decade on both national and community level [(1)] .Juvenile delinquency can be defined as the illegal activities of children and adolescents.

Over the last 20 years, the number of adolescents involved in the criminal justice system and in custody in the United States has continued to rise. According to the 2008 National Report on Juvenile Offenders by the Office of Juvenile Justice and Delinquency Prevention (OJJDP), the criminal justice system has shown overall dramatic arrest rate increase for juveniles by 22% [(2)].

In Egypt, although, the exact number of juvenile delinquents is unknown, according to the Ministry of Interior Statistics; more than 25 percent of all arrested children in Egypt in 2001 were arrested on charges of being vulnerable to delinquency [(3)]. However, their number has more doubled since 2000, rising from 17.228 arrests to 32.957 in 2008 [(4,5)].

The repeated performance of aggressive behaviors results in severe negative consequences for both family and community system. Disturbed behaviors or delinquency exhibited in childhood can evolve into chronic disorder, which persists into adulthood. Consequently, adolescent antisocial behavior is an extremely costly social problem. Furthermore, chronic adolescent antisocial behavior is predictive of adult criminal behavior, antisocial personality, alcoholism, drunk driving, psychiatric disorders, and poor work, occupational, and marital adjustment[(1,6)].

Unfortunately, the correctional institutions didn't introduce radical change into the methods of care for institutionalized children. Methods of addressing the problems of children at risk and juvenile delinquents remained conventional and rigid. The main aim behind establishing such institutions and confining these children to them was to free society of the problem. In fact, such measures usually reinforced negative behaviors because they exposed children to other models of delinquent behaviors. This attitude reinforced their stigmatization and ignored the children's specific needs. The family environment was replaced with an artificial and in most cases, unfriendly institutional environment[(1,7)].

Innovative methods and interventions need to be implemented to help reduce crimes committed by juveniles, for public safety as well as for the safety of the juveniles. The most logical strategy place for intervention efforts is the behavior correction [(8)].

Cognitive Behavioral Therapy (CBT) is a psychological approach that is often used to treat individuals with behavioral problems or to assist in enhancing existing thinking skills. CBT is designed to influence knowledge, attitudes, decision making processes and finally behaviors.

Cognitive behavioral therapy (CBT) central tent is that cognitions or thoughts are the most important causal factors in our behavior; it is our thoughts and how we interpret them, more than any external stimuli, which elicit, reward and punish our actions and thereby control them. Hence, if we wish to change a pattern of behavior, we must change the pattern of thoughts underlying it. Thus, behavior

follows thoughts. To eliminate the criminal behaviors, it is necessary to demolish the old thinking patterns, lay a new foundation through teaching new concepts, and build a new structure of thinking pattern where in the criminal puts into action what he has learned [7]. Cognitive behavioral therapy aims to help the delinquents to become aware of thought distortions which are causing psychological distress, and of behavioral patterns which are reinforcing it, and to correct them. Throughout this process, the delinquents acquire coping strategies as well as improved skills of appropriate decision making, critical thinking, assertiveness and communication skills [9] .

Improving and maintaining the health status of juvenile delinquents is a critical responsibility of the community health nurse. She is the person who has the greatest chance of being in close contact with the delinquents. So, she can help delinquents to learn behaviors that decrease their anxiety in stressful situations as well as the problem solving techniques and conflict resolution skills when encountered with a violent situation. She can share in providing a health promotion, mental health rehabilitation programs as well as effective intervention strategies [8,9]. Thus, the community health nurse plays a pervasively crucial role in dealing with delinquency as a serious public health problem and with delinquents as a risk group in the community. She can address the problem of juvenile delinquency and specifies the care required.

Aims of the study to:

- Identify the effect of Cognitive Behavioral Therapy on behaviors of juvenile delinquents resident in correctional institutions in Alexandria.
- Research Hypotheses
- Juvenile offenders, who received the Cognitive Behavioral Therapy, will demonstrate an overall improvement in their behaviors.

Materials:

Research design:

A Quasi experimental design was adopted to carry out this study.

Setting:

The study was conducted in two residential correctional institutions affiliated to the Ministry of Social Solidarity at Alexandria city. They were namely "Alexandria Association for delinquents' care for girls" and "Dar El Tarbeya El Egtemayhea for boys" which is located in "Mogameh El. Defah".

Subjects:

All Juvenile delinquents (boys and girls) resident in the previously mentioned correctional institutions were included in the study. They accounted for 40 juvenile delinquents (20 boys, 20 girls) and their age group ranged from 11 to 17 years.

Tools:

In order to collect the necessary data for the study the following tools were used:

Tool I: Strengths and Difficulties Questionnaire (SDQ):

It is a brief self reported behavioral questionnaire to be used by children and adolescents (11-17 years) as well as by the guardians or caregivers. It was developed by Goodman, [10] while translated and validated by Alyahri *et al.,* [11]. SDQ tool is used to assess the behavioral, emotional, and social problems among adolescents. This tool has also been used successfully in correctly identifying psychiatric diagnoses for the majority of children with conduct, hyperactivity, depressive, and anxiety disorders. It inquires about 25 attributes; some are positive while others are negative. These 25 items are subdivided into 5 sub-scales (emotional symptoms, conduct problems, hyperactivity and attention, peer relationship problems and prosaical behaviors), each sub scale has five items. Responses to each item are either not true, somewhat true, or certainly true. For each subscale the scores ranged from 1- 10. Somewhat true is scored as 1, but the scoring of not true and not certainly true varies, either 0 or 2 within the item. The total score is generated by summing up the scores from all sub-scales except the prosocial scale which was considered different from psychological difficulties. The resultant total score ranges from 1-40 where as those having a score of 20- 40 are considered abnormal. Those who have a score from 16 -19 are considered borderline while those who have from 0 -15 will be considered as normal by self administered SDQ . Regarding the SDQ used by caregivers/ guardians, the total score ranges from 1-40 where those having a score of 17-40 are considered abnormal. Those who have a score from 14 -16 are considered borderline while those who have from 0 -13 will be considered normal .SDQ was used as pre and post test applied immediately and after 3 months of program implementation to evaluate the impact of intervention as follow.

Tool II- Structured interview schedule:

It included socio demographic data as age, sex, level of education of juvenile delinquents.

Methods

An official letter from the faculty of Nursing was directed to the directorate of Social Solidarity to obtain the approval to carry out the study at selected correctional institutions in Alexandria.

A pilot study was carried out on 10 delinquents who were randomly chosen from residential correctional institution not included in the sample .

- Nursing intervention (Cognitive Behavioral Therapy):

I-Preparation phase:

• Initial assessment of all delinquents resident in the selected correctional institutions using SDQ (Strengths and Difficulties Questionnaire) was carried out before applying the cognitive behavioral therapy (CBT) .

Based on the results of the SDQ analysis, all delinquents (20 boys and 20 girls) were identified as high risk group. They were further divided into six subgroups according to their age and sex. Each group ranged from 5 to 8 delinquents. (3 groups of boys and 3 groups of girls).

II- Developmental phase:

The program objectives and methodology were prepared using CBT manual guide for children and adolescents [12].

III- Implementation phase:

Each delinquent included in the study was interviewed individually to collect the necessary data using tool II. Privacy was maintained.

The program was conducted on 10 consecutive sessions, 3 days per week, two sessions per day for two different groups. Each session duration ranged from 1-2 hours.

IV- Evaluation phase:

The delinquents in the present program were evaluated to determine the extent to which they have acquired the desired skills and practiced it.

Evaluation of the delinquents prior the program was done in the form of pre test administered to them and to the guardians/ caregivers using tool (I). At the end of the program, a post test was carried out using the same SDQ tool (I) as in pre test, administered to delinquents and guardians. Post tests were conducted twice, immediately after the end of the programme and 3 months later to evaluate the immediate and retained changes in delinquents' behaviours.

Components of CBT	Number of sessions
- Program expectations	1
- Breaking the ice	1
- Self understanding Know my self (strengths, difficulties) Know myself (like, dislike) Understand my emotions	3
- Emotion Control	1
- Problem solving approach	1
-Application of problem solving	3

3. Results:

Table I: illustrates socio demographic characteristics of 40 juvenile delinquents residents in correctional institutions in Alexandria in relation to their sex.

Regarding delinquents' age, it ranges from 11-17 years with a mean of 14.95 ±1.74 years. Less than half (47.5%) of them aged from 15 to 17 years, while more than one third (35%) aged 13- 15 years, and 17.5% of delinquents aged 11-13 years .

Concerning siblings' number, just one tenth (10%) of them had more than 6 siblings, with the same percentage for both boys and girls. While 40% of boys compared to 45% of girls had 3-6 siblings. On the other hand, those who had no brothers or sisters constituted 12.5% .

As regard delinquents' birth order, the table shows that it ranges from first to fourth or more. More than one tenth (15%) of them ranked the first child, while nearly one third (32.5%) were the second child and (40%) ranked the third child or more in the family.

The table also portrays the age of institutionalization; just three quarters (75%) of delinquents were institutionalized at age more than 10 years. They constituted 70%, and 80% of delinquent boys and girls respectively, with a mean of 11.10 ±1.39 years.

Regarding the reasons of institutionalization, the same table reveals that there is a statistically significant difference between delinquent boys and girls (MCT=14.807, P =0.001), as homelessness was reported by 85% of delinquent girls as compared to 20% of boys. While murder and drugs were stated by 20%, 25% of delinquent boys respectively compared to none of girls. Prostitution was reported by 30% of girls and none of boys. Those who were institutionalized because of begging were less than one third (30%), this percentage composed of 25% of boys and 35% of girls, while less than half (40%) were institutionalized because of thievery, robbery with the same percentage for both boys and girls.

Concerning the duration of institutionalization, the table also reveals that a statistically significant difference was found between delinquent boys and girls as regards duration of institutionalization (X_2^2=5.08, P =0.020). More than half of the delinquent boys (60%) compared to 30% of girls were institutionalized for less than 1 year, while 60% of girls and 25% of boys were institutionalized for 1-5 years. The rest of the delinquents (12.5%) were institutionalized for more than 5 years, with a mean of 1.95 years (1.95 ±1.34)

Table II: Shows delinquents' SDQ total difficulties score pre and post CBT

Concerning self administered SDQ (pre CBT), none of delinquents had normal SDQ scores before implementing the CBT. While (65%, 32.5%, respectively) of them were normal in the immediate evaluation of the CBT and in final evaluation after 3 months.

Regarding the guardian SDQ form, in the immediate post program evaluation, more than half (55%) of the delinquents were normal compared to none in the pre program evaluation. While in the final evaluation, more than one third (37.5%) of them were normal.

Table III: Comparison of the effect of CBT on delinquents (boys and girls):

Concerning self administered SDQ , none of the delinquent boys, girls had normal SDQ scores before implementing the CBT, compared to (55%, 75% respectively) immediately after the CBT. In the second evaluation after 3 months of the CBT, one quarter (25%) of the delinquent boys compared to (40%) of girls had normal scores.

Regarding the guardian SDQ form, none of the delinquent boys, girls had normal SDQ scores before implementing the CBT, then less than half (45%) of boys compared to 65% of girls were normal immediately after the CBT. While in the second evaluation after 3 months of the CBT, (35%, 40%, respectively) of delinquent boys and girls had normal scores.

Table IV: Presents delinquents' emotional, behavioral and social difficulties during the study.

Starting with self administered SDQ, the table reveals that more than one third (35%) of delinquent boys and more than half (60%) of girls were normal had no hyperactivity prior the CBT implementation. While in the immediate assessment after CBT, the majority of delinquent boys and girls were normal (70%, 75% respectively). Then in the second evaluation after 3 months, more than half (55%) of delinquents were normal, with the same percentage for both sex.

One quarter (25%) of delinquent boys compared to more than one third (35%) of girls had no emotional problems pre the CBT implementation. In the immediate end program evaluation, one quarter (25%) of delinquent boys compared to almost all delinquent girls (95%) had no emotional problems. Moreover, in the second evaluation, more than one third (40%) of boys compared to more than half (55%) of girls were normal.

More than one third (40%) of boys compared to 50% of girls had no conduct problems before implementing the CBT. While in the immediate end program evaluation, 40% of boys compared to 80% of girls had no conduct problems .On the other hand , in the final program evaluation less than one third (30%) of boys and the majority (65%) of girls were normal.

Moreover, less than one third (30%) of delinquent boys compared to 5% of girls had no problems in peer relationships before the CBT. While in the immediate evaluation, less than half (40%) of boys compared to less than three quarters (70%) of girls had normal relations with peers. On the other hand , 40% of boys and 60% of girls were normal in the second evaluation after 3 months.

Concerning the guardian SDQ form, More than half (55%) of delinquent boys and girls had no hyperactivity pre CBT, compared to (75% ,70% respectively) in the immediate evaluation after the CBT , and the same was noticed during the final evaluation (80%, 75% respectively).

It is also apparent that only 5% of delinquent boys and girls were emotionally normal prior the CBT implementation, then 15% of boys compared to 40% of girls were normal in the first evaluation immediately after the CBT. Moreover, less than one quarter (20%) of boys and 15% of girls were normal in the final evaluation after 3 months of the program.

One quarter (25%) of boys and 15% of girls had no conduct problems before the CBT implementation, while 15% of boys compared to 70% of girls were normal in the immediate post program evaluation .Additionally, in the second evaluation of the CBT, 50% of boys and 55% of girls had no conduct problems.

It is evident that 15% of delinquent boys and girls have normal peer relations prior the CBT implementation with the same percentage for both sex. Then only one quarter (25%) of boys compared to none of girls had no troubles in peer relationships in the immediate end program evaluation. Furthermore, 20% of boys in comparison to 15% of girls had normal peer relationships in the final evaluation of the CBT.

4. Discussion

In recent years, there has been a greater concern about the problem of juvenile delinquency, its causes and consequences. Juvenile offenders are becoming more dangerous and pose a threat to themselves and to the society. Innovative methods and interventions need to be implemented to help for reducing crimes committed by juveniles, ensuring public safety as well as the safety of the juveniles. The most logical strategy place for intervention efforts is the behavior correction strategy [13].

With respect to the socio demographic characteristics of the delinquents, the findings of the present study revealed that the majority (82.5%) of the studied delinquents were 13-17 years with a mean of 14.7 years. This high percentage of adolescent delinquents agrees with many theories which explained why offending peaks in the teenage years [8, 14]. The most popular explanation focuses on social influence from birth; children are under the influence of their parents who generally discourage offending. However, during their teenage years, juveniles gradually break away from the control of their parents and become influenced by their peers, who may encourage offending in many cases, also they have some strong rebellious feelings that manifest themselves in unexpected ways. Studies in parallel with these are varied 2002 as Salem ES et al [15] who reported that peak age for delinquency is ranged between 7-16 years with a mean of 13.7 years.

Large size family has been shown to be a risk factor for problematic behaviors. 2006 Amar [16] in his study of family violence and delinquency reported that the larger the family size, the greater the risk of children delinquency. The finding from the

present study showed that the majority of the delinquents were from large families. Possible explanation is that it's the interaction within the family, rather than its size, which influence the occurrence of deviant behaviors. Parents of at risk youth might have less time to spend with their children or might not provide the kind of cognitive stimulation or financial support that children need. So, the children experience parental neglects find their way away from home.

The literature reveals that, the child birth order affect his relation with his parents and siblings. The youngest child feels that he has less power, freedom and confidence than older ones, accordingly with the advent of puberty, he might rebel more strongly. So, delinquency may be a way to compensate his feeling of low self esteem and worthless and to deal with this conflictual issues. The same findings were reported by 2002 Mohamed [17], who stated that delinquency is seen more among youngest child in their families and less among the single ones. This is in agreement with the results of the present study which indicated that, the youngest children are slightly more vulnerable to delinquency than children of other birth orders .

Teenagers generally lack strong bonds to conventional adult institutions, such as work and family. At the same time, teens are faced with strong potential rewards for offending: money, status, power, autonomy, identity claims, strong sensate experiences, and respect from similar peers. Further, their dependent status as juveniles insulates teens from many of the social and legal costs of illegitimate activities, and their stage of cognitive development limits prudence concerning the consequences of their behaviors[18,19]. The findings from this study indicated that the majority of delinquents were institutionalized at age 10 years or more, because of being homeless, begging or performing crimes or felonies.

Youth who are involved with the juvenile justice system have subsequently higher rates of mental health disorders than children in the general population. The prevalence of mental disorders among youth in the general population is estimated to be about 22% compared to 60% among youth in the juvenile justice system [20,21].

Institutionalization and imprisonment can cause serious mental and behavioral problems. There are many factors in prisons and residential institutions have negative effects on mental health including; overcrowding, various forms of violence , enforced solitude or conversely lack of privacy , lack of meaningful activity , isolation from social networks, insecurity about future prospects (work, relationships, etc), restriction by institutional routines, low levels of stimulation, boredom and inadequate health care services. This could explain the results of the present study which indicated that juvenile delinquents had mental and behavioral problems mainly conduct problems, attention deficit hyperactivity disorder, emotional problems and social relation problems[22].

Generation of studies in criminology show that the best predictor of future behavior is past behavior. Children showing persistent disruptive behavior are likely to become delinquents and in turn delinquent children are likely to become serious, violent or chronic juvenile offenders [23]. Children with frequent disruptive behaviors are usually classified as experiencing emotional and behavioral difficulties. Conduct disorder is a more extreme form of disruptive behavior, characterized by persistent aggressive or antisocial behaviors, deliberate damage to properties, cruelty to other people or animals, theft, deceit, serious rule violation. Delinquent behavior may lead to, or be a part of a conduct disorder. Conduct disorder frequently co-exists with a range of problems such as attention deficit hyperactivity disorder, anxiety and depression. Disruptive behaviors are associated with poor academic achievement, low self esteem, low frustration tolerance, poor social skills and damaged relationship with family, peers [24].

The evidence is quite clear that youth with disruptive behaviors such as conduct disorder, and attention deficit hyperactivity disorder, manifest substantially increased rates of aggressive behaviors. Aggressive and delinquents behaviors are part by impulsiveness, which can often lead a youth to respond to emotional situations without pausing to consider the consequences [25].

The results of the present study come in agreement with several studies. For example; 2001 Darwish., [26] in her study of parentally deprived adolescent girls found that attention deficits hyperactivity disorders, aggression, oppositional disorder, anxiety, loneliness and antisocial behaviors were very prevalent among institutionalized girls. Further more, 2005 Wasserman GA , [27] found that 34% of a sample of detainees had mental disorders as anxiety, affective, disruptive behavior disorders. In addition, the results of 2010 Tepline LA et al .,[28] who indicated that between one half and two thirds of juvenile boys detainees have one or more psychiatric disorders as socialization problems, anxiety and depression, which occurred as results of the conditions associated with extended detention, such as separation from loved ones, crowding ,and solitary confinement. Moreover, 2011 Noseir H et al., [29] who found that delinquent boys had psychological, behavioral problems as aggression, conduct disorders and emotional troubles.

Increasing the numbers of youth with mental health issues are coming to the attention of the justice system. CBT has been found to be the most widely studied and is an empirically validated treatment for aggression and violence. CBT can help to retain the way the juvenile delinquents thinks, acts, and behaves. CBT also nurtures new skills that improve the undesirable behaviors. It can make a difference to

child's behavior and help with the way he copes with problems and behaviors at home, school, or with friends. In CBT, juvenile delinquents are taught problems solving skills, anger control, social skills, coping skills and assertiveness that may result in a reduction of aggressive behaviors. Moreover, CBT is most helpful in managing the associated problems such as low self esteem, relationship difficulties, and emotional troubles particularly internalizing symptoms as anxiety and depression [30, 31].

The most successful achievement of CBT is increasing the number of normal delinquents to (65%, 55% respectively) in both SDQ self administered and guardian scores in the immediate post CBT evaluation. Furthermore, after 3 months (32.5%, 37.5% respectively) of them were normal in both SDQ scores. These results came in accordance with several studies which found that CBT was one of the most effective treatment strategies for aggression and violent behaviors especially among juvenile delinquents[32 -34].

According to numerous criminology studies, only those offenders who are sufficiently motivated to change and are optimistic about the future will manage to desist from offending. Interventions are more likely to be successful if offenders believed that an alternative future is possible and therefore, it's worth changing to accomplish future goals [35,36].

The results of the present study indicated that girls had higher improvement rates than boys as immediately after the CBT (75%) of girls compared to (55%) of boys were normal, and (40%) of girls in comparison to (25%) of boys were normal in the second evaluation after 3 months of the CBT. This could be explained as the process of desistance from crime affected by the process of maturation, changed life style and relationships. Furthermore, some gender differences have been found in the rationales given for desisting from crime as young women step beyond their traditional gender roles as motherhood, parenting responsibilities and commitments (to children, parents, and partners). On the other hand, young men focus more on personal choices, self agency and masculine powerful features [37]. These results come in accordance with several studies as 1999 Alam M [38] found that behavioral therapy had a positive effect in modification of aggressive, antisocial behaviors of delinquent boys. Similarly, 2003 El Silan H [39] proved that CBT was very effective in reducing aggressive behaviors, improving communication skills, and social relations in parentally deprived adolescent girls. Also, McCart M et al 2006 compared the effectiveness of CBT and behavioral parent training BPT for male and female youth in detention and found that CBT was most effective for the female offenders aged 13-18 years.

Table I: Distribution of delinquents (boys and girls) according to their socio demographic characteristics:

Characteristics	Sex				Total (n= 40)		Test of significance
	Boys (n= 20)		Girls(n= 20)				
	No	%	No	%	No	%	
Age							
- 11- less than 13 years	2	10	5	25	7	17.5	X_2^2=2.89
- 13- less than 15 years	6	30	8	40	14	35	P =(0.235)
- 15-17 years	12	60	7	35	19	47.5	
X ± SD						14.95 ±1.74	
Sibling number							
-None	2	10	3	15	5	12.5	FET=0.26
-< 3	7	35	7	35	14	35	P =(0.967)
- 3-6	9	45	8	40	17	42.5	
- > 6	2	10	2	10	4	10	
Birth order							
-1st	4	20	2	10	6	15	X_3^2=0.94
-2nd	6	30	7	35	13	32.5	P =(0.816)
-3rd or more	8	40	8	40	16	40	
-No sibling	2	10	3	15	5	12.5	
Age at institutionalization							
- Less than 10 years	6	30	4	20	10	25	X 2=0.533
-More than 10 years	14	70	16	80	30	75	P =(0.465)
X± SD 11.10 ±1.39							
Reasons of institutionalization*							
- Homeless	4	20	17	85	21	52.5	MCT =14.807
- Thievery / Robbery	8	40	8	40	16	40	
- Begging	5	25	7	35	12	30	P =(0.001)**
- Prostitution	0	0	6	30	6	15	
- Drugs	4	20	0	0	4	10	
- Murder	5	25	0	0	5	12.5	
Duration of institutionalization							
- Less than 1 year	12	60	6	30	18	45	X2 2=5.08
- 1-5 years	5	25	12	60	17	42.5	
- More than 5 years	3	15	2	10	5	12.5	P =(0.020)**
X± SD 1.95 ±1.34							

FET=Fisher exact test; MCT=Monte Carlo test; * More than one answer; ** Statistically significant at 0.0

Table II: Distribution of delinquents according to their SDQ total scores pre and post CBT:

SDQ scores	Self administered SDQ n=40						Guardians SDQ n=40						Test of significance								
	Pre CBT		Post 1 CBT		Post 2 CBT		Pre CBT		Post 1 CBT		Post 2 CBT		χ^{2a}	χ^{2b}	χ^{2c}	χ^{2d}	χ^{2e}	χ^{2f}	χ^{2g}	χ^{2h}	χ^{2i}
	No	%	No	%	No	%	No	%	No	%	No	%	χ^2=2.14 P=0.343	χ^2=1.00 P=0.607	χ^2=3.53 P=0.171	χ^2=43.2 P=0.000 **	χ^2=15.59 P=0.000 **	χ^2=13.22 P=0.001 **	χ^2=41.51 P=0.000 **	χ^2=19.79 P=0.001 **	χ^2=7.81 P=0.020 **
Normal	0	0	26	65	13	32.5	0	0	22	55	15	37.5									
Borderline	15	37.5	11	27.5	11	27.5	9	22.5	13	32.5	9	22.5									
Abnormal	25	62.5	3	7.5	16	40	31	77.5	5	12.5	16	40									

χ^{2a} The association between self and guardian SDQ total score in the pre CBT phase
χ^{2b} The association between self and guardian SDQ total score in the immediate post CBT evaluation (post1)
χ^{2c} The association between self and guardian SDQ total score in the final post CBT evaluation (post2)
χ^{2d} The association between pre and post1 self SDQ total score
χ^{2e} The association between pre and post 2 self SDQ total score
χ^{2f} The association between post 1 and post2 self SDQ total score
χ^{2g} The association between pre and post1 guardian SDQ total score
χ^{2h} The association between pre and post2 guardian SDQ total score
χ^{2i} The association between post1 and post2 guardian SDQ total score
** Statistically significant at 0.05

Table III: Comparison between delinquents boys and girls according to their SDQ total scores pre and post CBT:

SDQ scores	Boys						Girls						Test of significance					
	Pre CBT		Post 1 CBT		Post 2 CBT		Pre CBT		Post 1 CBT		Post 2 CBT							
	No	%	No	%	No	%	No	%	No	%	No	%						
Self SDQ													χ^{2a}	χ^{2b}	χ^{2c}	χ^{2d}	χ^{2e}	χ^{2f}
Normal	0	0	11	55	5	25	0	0	15	75	8	40						
Borderline	8	40	7	35	6	30	7	35	4	20	5	25	χ=18.21	χ=5.71	χ=6.78	χ=26.1	χ=10.13	χ=6.74
Abnormal	12	60	2	10	9	45	13	65	1	5	7	35	P=0.00*	P=0.058	P=0.034*	P=0.00*	P=0.006*	P=0.034*
Guardians SDQ													χ^{2g}	χ^{2h}	χ^{2i}	χ^{2j}	χ^{2k}	χ^{2l}
Normal	0	0	9	45	7	35	0	0	13	65	8	40						
Borderline	5	25	8	40	5	25	4	20	5	25	4	20	χ=17.69	χ=9.13 P=0.010*	χ=7.81	χ=24.00 P=0.000*	χ=10.67 P=0.005*	χ=4.9
Abnormal	15	75	3	15	8	40	16	80	2	10	8	40	P=0.001*		P=0.020*			P=0.008*

χ^{2a} The association between boys pre and post1 self SDQ score
χ^{2b} The association between boys pre and post2 self SDQ score
χ^{2c} The association between boys post1 and post2 self SDQ score
χ^{2d} The association between girls pre and post1 self SDQ score
χ^{2e} The association between girls pre and post2 self SDQ l score
χ^{2f} The association between girls post1 and post2 self SDQ score
χ^{2g} The association between boys pre and post1 guardian SDQ score
χ^{2h} The association between boys pre and post2 guardian SDQ score
χ^{2i} The association between boys post1 and post2 guardian SDQ score
χ^{2j} The association between girls pre and post1 guardian SDQ score
χ^{2k} The association between girls pre and post2 guardian SDQ score
χ^{2l} The association between girls post1 and post2 guardian SDQ score
χ^{2m} The association between boys & girls pre self SDQ score (X_2^2=0.107 P=0.744)
χ^{2n} The association between boys & girls post1 self SDQ score(X_2^2=1.77 P=0.413)
χ^{2o} The association between boys & girls post2 self SDQ score(X_2^2=0.107 P=0.744)
χ^{2p} The association between boys & girls pre guardian SDQ score(X_2^2=0.143 P=0.932)
χ^{2q} The association between boys & girls post1 guardian SDQ score(X_2^2=1.62 P=0.445)
χ^{2r} The association between boys & girls post2 guardian SDQ score(X_2^2=0.178 P=0.915)
* Statistically significant at 0.05

Table IV: Distribution of delinquents (boys and girls) according to their SDQ results as assessed by themselves and their guardians

Self SDQ scores	Boys						Girls						Test of significance		
	Pre CBT		Post 1 CBT		Post 2 CBT		Pre CBT		Post 1 CBT		Post 2 CBT				
	No	%	No	%	No	%	No	%	No	%	No	%			
Hyperactivity problem													χ^{2a}	χ^{2b}	χ^{2c}
Normal	7	35	14	70	11	55	12	60	15	75	11	55	χ_2^2=5.89	χ_2^2=0.368	χ_2^2=0.234
Borderline	7	35	4	20	6	30	7	35	4	20	5	25			
Abnormal	6	30	2	10	3	15	1	5	1	5	4	20	P=0.053*	P=0.831	P=0.891
Emotional symptom													χ^{2d}	χ^{2e}	χ^{2f}
Normal	5	25	5	25	8	40	7	35	19	95	11	55	χ_2^2=3.22	χ_2^2=20.4	χ_2^2=4.52
Borderline	1	5	1	5	1	5	4	20	0	0	4	20			
Abnormal	14	70	14	70	11	55	9	45	1	5	5	25	P=0.020*	P=0.000*	P=0.104
Conduct problem													χ^{2g}	χ^{2h}	χ^{2i}
Normal	8	40	8	40	6	30	10	50	16	80	13	65	χ_2^2=4.81	χ_2^2=8.25	χ_2^2=4.91
Borderline	3	15	4	20	4	20	2	10	3	15	2	10			
Abnormal	9	45	8	40	10	50	8	40	1	5	5	25	P=0.007*	P=0.016*	P=0.086
Peer problems													χ^{2j}	χ^{2k}	χ^{2l}
Normal	6	30	9	45	8	40	1	5	14	70	12	60	χ_2^2=7.73	χ_2^2=3.20	χ_2^2=6.25
Borderline	9	45	6	30	9	45	6	30	2	10	2	10			
Abnormal	5	25	5	25	3	15	13	65	4	20	6	30	P=0.021*	P=0.020*	P=0.044*

χ^{2a} The association between boys & girls pre self SDQ Hyperactivity score
χ^{2b} The association between boys & girls post1 self SDQ Hyperactivity score
χ^{2g} The association between boys & girls pre self SDQ conduct problems score
χ^{2h} The association between boys & girls post1 self SDQ conduct problems score

χ^{2c} The association between boys & girls post2 self SDQ Hyperactivity score
χ^{2d} The association between boys & girls pre self SDQ emotional problems score
χ^{2e} The association between boys & girls post1 self SDQ emotional problems score
χ^{2f} The association between boys & girls post2 self SDQ emotional problems score
* Statistically significant at 0.05

χ^{2i} The association between boys & girls post2 self SDQ conduct problems score
χ^{2j} The association between boys & girls pre self SDQ peer problems score
χ^{2k} The association between boys & girls post1 self SDQ peer problems score
χ^{2L} The association between boys & girls post2 self SDQ peer problems score

Table V: Distribution of delinquents (boys and girls) according to their SDQ results as assessed by themselves and their guardians (continued)

Guardian SDQ scores	Boys						Girls						Test of significance		
	Pre CBT		Post 1 CBT		Post 2 CBT		Pre CBT		Post 1 CBT		Post 2 CBT				
	No	%	No	%	No	%	No	%	No	%	No	%			
Hyperactivity problem													χ^{2a}	χ^{2b}	χ^{2c}
Normal	11	55	15	75	16	80	11	55	14	70	15	75	χ_2^2=5.84	χ_2^2=0.18	χ_2^2=1.03
Borderline	1	5	3	15	2	10	6	30	4	20	4	20			
Abnormal	8	40	2	10	2	10	3	15	2	10	1	5	P=0.054*	P=0.913	P=0.597
Emotional symptom													χ^{2d}	χ^{2e}	χ^{2f}
Normal	1	5	3	15	4	20	1	5	8	40	3	15	χ_2^2=1.12	χ_2^2=3.16	χ_2^2=1.00
Borderline	1	5	8	40	5	25	3	15	6	30	3	15			
Abnormal	18	90	9	45	11	55	16	80	6	30	14	70	P=0. 572	P=0.206	P=0.606
Conduct problem													χ^{2g}	χ^{2h}	χ^{2i}
Normal	5	25	3	15	10	50	3	15	14	70	11	55	χ_2^2=6.83	χ_2^2=15.5	χ_2^2=1.41
Borderline	3	15	6	30	2	10	4	20	5	25	4	20			
Abnormal	12	60	11	55	8	40	13	65	1	5	5	25	P=0.117	P=0.000*	P=0.495
Peer problems													χ^{2j}	χ^{2k}	χ^{2l}
Normal	3	15	5	25	4	20	3	15	0	0	3	15	χ_2^2=1.03	χ_2^2=5.80	χ_2^2=4.42
Borderline	1	5	9	45	7	35	0	0	13	65	2	10			
Abnormal	16	80	6	30	9	45	17	85	7	35	15	75	P=0.597	P=0.055	P=0.110

χ^{2a} The association between boys & girls pre guardian SDQ Hyperactivity score
χ^{2b} The association between boys & girls post1 guardian SDQ Hyperactivity score
χ^{2c} The association between boys & girls post2 guardian SDQ Hyperactivity score
χ^{2d} The association between boys & girls pre guardian SDQ emotional problems score
χ^{2e} The association between boys & girls post1 guardian SDQ emotional problems score
χ^{2f} The association between boys & girls post2 guardian SDQ emotional problems score
* Statistically significant at 0.05

χ^{2g} The association between boys & girls pre guardian SDQ conduct problems score
χ^{2h} The association between boys & girls post1 guardian SDQ conduct problems score
χ^{2i} The association between boys & girls post2 guardian SDQ conduct problems score
χ^{2j} The association between boys & girls pre guardian SDQ peer problems score
χ^{2k} The association between boys & girls post1 guardian SDQ peer problems score
χ^{2L} The association between boys & girls post2 guardian SDQ peer problems score

Conclusion

Based on the present study findings, it could be concluded that juvenile delinquents have high rates of mental, behavioral health problems. According to initial assessment done by SDQ, about two thirds (62.5%) of delinquents were abnormal, while the rest (37.5%) were borderline before implementing the CBT. Furthermore, around one third (32.5%) of the delinquents had hyperactivity and attention problems, (42.5%) of them had conduct problems, while less than half (45%) of them had peer relations problems and more than half (57.5%) of them had emotional problems. However, those delinquents viewed as criminals rather than young people in need of assistance.

CBT was a promising rehabilitative treatment strategy for criminal offenders that explicitly target the criminal thinking as a contributing factor to deviant behaviors. Through CBT programs offenders learn new skills and new ways of thinking that can lead to changes in their behavior and actions, and ultimately affect their criminal conduct.

Recommendations:

1. To shift the approach to juvenile offenders from legalistic to preventive, protective and rehabilitative interventions.
2. To enforce and monitor all international and national commitment to children.
3. To establish clear mandates and lines of institutional responsibility for juvenile delinquents.
4. To understand better the situation of juvenile delinquents through further research in the following areas.

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1/25/2012