Efficacy of Mindfulness Based Cognitive Behaviour Therapy in Managing Anger among Students in Public Secondary Schools in Nakuru County, Kenya

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Abstract

Anger is a disruptive emotion, a strong feeling of distress in response to a specific provocation and one of the most challenging emotions encountered in psychotherapy. Despite the fact that a number of interventions have been put in place to help especially secondary school students to cope with anger, the problem of anger still looms in our academic institutions. This study aimed at establishing the efficacy of Mindfulness Based Cognitive Behavioral Therapy (MBCBT) in managing anger among 100 students (50 boys and 50 girls) in public secondary schools. The students were assigned to either an experimental group or a control group. Those in experimental group were exposed to an MBCBT intervention for a period of 10 weeks while those in the control group received no treatment for the same period. The findings of this study showed that MBCBT had a great impact in the reduction of anger, depressive, and anxiety symptoms. It also confirmed that MBCBT is a superior intervention for extreme anger.

Key Words: Efficacy, mindfulness based cognitive behavioral therapy, anger, anxiety, Depression

Introduction and background

Although mindfulness based cognitive behavioral therapies have been viewed as recent inventions in schools to treat behavioral problems, a number of studies (Grabovac et al., 2011; Howell & Buro, 2011; Jankowski & Holas, 2014; Shapiro et al., 2011; Zelazo & Lyons, 2012) have documented evidence on the working of these intervention to produce satisfactory results. There is however limited documentation on the application of MBCBT in the treatment of anger especially among secondary school students. Given that anger is a global problem, psychotherapists are still grappling with an effective intervention to help students challenged with extreme anger. With the burning of secondary schools by students in Kenya in 2016 among other arson activities engaged by secondary school students in an attempt to vent their anger, an effective intervention need to be put in place to help the students cope with anger.

In other contexts, MBIs have yielded satisfactory results among children and adolescents in both clinical and non-clinical samples (Black, Milam, & Sussman, 2009). Prior research has shown that mindfulness training brings about improvements in attention control thus enabling students to improve in academics, problem solving and decision making (Flook et al., 2010). If children improve in attention control, they remember things successfully. This in turn boosts their academic achievement (Hooker & Fodor, 2008). Adolescents with externalizing disorders exposed to mindfulness training report high redirected attention. This is because mindfulness interventions disrupts the cycle of automatic aggressive behavior (Singh et al., 2011) hence helping them get more focused in their academics and life. In addition, mindfulness interventions enhance increased awareness regarding one's feelings (Coholic, 2011). If students cultivate awareness about their feelings, they are likely to regulate their emotions and behave in accordance to the societal laid down laws and expectations (Carriochi, Kashdan, Leeson, Heaven, and Jordan, 2011).

In a student population, mindfulness techniques help them in focusing on the present moment (Siegel, 2010). Siegel further points out that mindfulness training reduces stress, anxiety and depressive symptoms besides increasing vitality and resilience. Further studies by Hoffman, Sawyer, Witt, and Oh (2010) are in support of the idea that mindfulness-based therapy reduces anxiety and depressive symptoms. Besides this, mindfulness training may alter baseline activity of the amygdala hence serving a preventive role to a depressive mood (Way, Creswell, Eisenberger, & Lieberman, 2010).

It is also important to note that Mindfulness Based Interventions(MBI's) lead to a reduction in symptoms of depression in children (Liehr & Diaz, 2010), leading to a reduction in anxiety and increase of social skills in students with learning disorders (Beauchemin, Hutchins, and Patterson, 2008). There is an indication that students exposed to MBIs are likely to improve their academic performance, interpersonal relations, stress-reduction, and physical health (Sibinga et al., 2011). It is therefore possible that the application of MBCBT to treat anger will yield other multiple benefits among secondary school students.

Methodology

Purposeful sampling was used to select two secondary schools from the 24 schools in Nakuru sub-County. The two secondary schools sampled were both mixed county secondary schools. Besides this, students in the two schools had in a number of times involved themselves in acts of violence prompting the school management and the county education office to be deeply concerned of the behavioral state of students in these schools. Attempts had also been made by some counselors to help the students to manage their anger but the situation seemed not to improve. A total of 50 girls and 50 boys were selected from the two secondary schools. To obtain this sample, all the forms three and four students were screened for anger using the State Trait Anger Inventory 2 (STAXI-2) tool. Students whose raw score on trait anger was above 22 were recruited to participate in the study.

The research design adopted in this study was the quasi-experimental research design. This design is suitable in collecting and analyzing quantitative data in social sciences for the purposes of testing the outcome of an intervention (Mugenda, 2008). The findings in one study in a quasi-experimental research design, is applied to other subjects and settings. This allows for some generalizations that can be made about the population. Participants from one school were randomly assigned to the experimental group which received an MBCBT intervention for a period of 10 weeks while those from the second school were assigned to the control group that did not receive any intervention for the same period.

The STAXI-2, Beck's Depression Inventory (BDI), and the Beck's Anxiety Inventory (BAI) were the main data collection instruments used in this study. STAXI-2 is a self-report questionnaire which produces six scales and two subscales. Having 57 items, STAXI-2 is a self-report measure of the experience of anger and expression of anger. It consists of 7 scales: Trait anger, measuring differences in the dispositional experience of anger; Anger expression, is the general index of the frequency of the expression of anger with two subscales of trait anger; State anger, measuring the individual's present feeling of anger; Anger control, measuring the frequency of external expression of anger; Angry temperament, measuring the general tendency to experience the expression of anger, without provocation; Anger-in, measuring the frequency

of suppression of angry feelings; Angry reaction, measuring the general dispositional experience of anger when the individual is provoked.

Beck Depression Inventory (BDI) is a self-completion questionnaire developed by Beck and Steer in 1993 to measure the severity of depression. Its score range is between 0–63 with scores between 0-10 indicative of a normal level of depression; 11-16 signifying mild mood disturbance; 17-20 indicative of borderline clinical depression; 21-30 representing moderate depression, 31-40 severe depression and over 40 signifying extreme depression. BDI has been used for over 35 years to pinpoint and assess depressive symptoms, and has been reported to be highly reliable irrespective of the population. It has a high coefficient alpha, (.80) its construct validity has been established, and it is able to differentiate depressed from non-depressed patients (Sharp & Lipsky, 2002). The assessment of the level of depression among the participants in this study using the BDI was important because it was hypothesized that there is a correlation between anger and depression.

Since there seem to be an association between anger and anxiety (Walsh, Benjamin Wolk, Becker-Haimes, Jensen-Doss, & Beidas, 2018). BAI is a self-completion questionnaire developed by Aaron T. Beck and colleagues designed to measure the levels of anxiety. It is a 21-item multiple-choice self-report inventory that measures the severity of an anxiety in adults and adolescents. The score range is between 0-63 with a score of 0-7 indicative of minimal level of anxiety; 8-15 representing mild anxiety; 16-25 indicative of moderate anxiety while 26-63 signifies severe anxiety. Studies done in Kenya and other parts of the world have reported high levels of reliability and validity of the BAI (Muriungi & Ndetei, 2013).

Screening for depression and anxiety was done for the recruited students at baseline. The assessment of the levels of anxiety and depression using BAI and BDI respectively was important in this study because it was hypothesized that anger, anxiety, and depression were correlated in a way. Therefore the treatment of anger automatically could lead to the reduction of the levels of anxiety and depression among the study participants. The students assigned to the experimental group were subjected to ten sessions of Mindfulness Based Cognitive Behavioral Therapy while those assigned to the control group did not receive treatment for the same ten weeks. A midline assessment for anger, anxiety, and depression was done after three months and a follow-up assessment after six months.

Descriptive statistics such as the mean were used to summarize continuous variables while categorical variables were summarized using frequencies. The study also utilized general linear modeling with two-way multivariate analyses of covariance (MANCOVA) and analysis of variance (ANOVA) to determine the main effects of gender on depression, anxiety, stress and all subscale scores of anger. P values of $p<0.05$ were considered statistically significant in this study.

In order to determine the presence of statistically significant group differences in each of the study phases (baseline, midline and end line), the Mann-Whitney U-test for independent samples was used. The probability of finding statistical differences that arise by chance was reduced by applying Bonferroni correction. Significance level equal to or lower than 0.017 was considered. It was also critical to carry out a Friedman's test for related samples to find out possible statistically significant differences in the control and experimental groups in the means of the variables in the three phases of the study.

Results

In the experimental group, the means of all the variables (except for Anger Control In and Anger Control Out)- decreased drastically in the midline as compared to baseline. The fact that the means of the two variables did not decrease pointed out that how often a person endeavors to prevent or control the expression of angry feelings and how often a person attempts to reduce and control angry feelings by calming down or cooling off was not altered by the intervention given. On the other hand, the means of the variables at midline were either maintained or deviated slightly from the mean at end line. These results are presented in table 1 below.

Table 1: Mean and SD of the target variables at Baseline, Midline, and End-line in the Experimental Group

	Baseline		Midline		Endline	
	Mean	Std. D	Mean	Std. D	Mean	Std. D
State Anger	33.74	7.842	18.12	4.054	17.98	3.639
Angry Feeling	11.42	3.429	6.28	1.852	6.18	1.674
Verbal Expression of Anger	10.76	3.305	6.06	1.671	5.96	1.324
Physical Expression of Anger	11.36	3.827	5.84	1.299	5.88	1.480
Trait Anger	24.90	4.537	12.94	2.729	12.80	2.886
Angry Temperament	12.02	2.583	6.52	1.488	6.38	1.602
Angry Reaction	12.88	2.797	6.42	1.739	6.42	1.691
Anger Expression Out	20.24	3.267	16.30	3.547	16.48	3.471
Anger Expression In	19.50	4.057	14.32	2.630	14.36	2.593
Anger Control Out	18.82	3.561	22.62	3.063	23.12	2.897
Anger Control In	19.62	3.533	22.30	2.859	22.52	2.565
Anger Expression Index	48.96	4.973	33.66	6.255	33.14	6.145
Anxiety	26.60	7.100	11.04	6.484	10.78	5.953
Depression	24.40	6.952	10.00	4.281	7.24	3.172

The results in table 1 show that the intervention worked very well in reducing anger symptoms significantly. The participants subjected to the MBCBT intervention had significant reduction in all the scales and subscales of anger, anxiety and depression. This can further be interpreted to mean that MBCBT is highly effective in the treatment of anger and other psychological disorders such as anxiety and depression. The small deviations of the scores at end-line seem to suggest that the respondents were now able to cope well with anger after the intervention. This also shows the sustainability of the treatment after six months.

The results of the control group showed no significant changes in the mean scores of the variables across the three phases as shown in table 2.

Table 2: Mean and SD of the Target Variables at Baseline, Midline, and End-line in the Control Group

VARIABLES	Baseline		Midline		End-line	
	Mean	Std. D	Mean	Std. D	Mean	Std. D
State Anger	37.02	6.610	37.08	5.094	36.88	5.220
Angry Feeling	13.94	3.472	13.50	2.894	13.70	2.887
Verbal Expression of Anger	11.86	2.711	11.98	2.308	12.10	2.517
Physical Expression of Anger	11.22	2.526	11.50	2.393	11.14	2.060
Trait Anger	29.80	4.041	29.36	4.009	29.22	4.137
Angry Temperament	15.10	2.323	14.84	2.486	14.86	2.515
Angry Reaction	14.80	2.680	14.50	2.565	14.34	2.654
Anger Expression Out	16.40	2.726	16.64	2.841	17.08	2.617
Anger Expression In	19.56	2.830	19.64	2.136	20.04	2.070
Anger Control Out	18.88	2.946	19.06	2.986	19.46	2.659
Anger Control In	20.38	3.636	20.64	3.154	20.72	3.338
Anger Expression Index	46.00	6.386	44.64	4.507	44.28	4.751
Anxiety	24.82	6.013	25.12	5.903	25.12	6.375
Depression	20.70	4.888	21.10	4.441	19.84	4.191

This study found out that unlike the experimental group, the control group reported no significant differences in the mean scores of the variables in the three phases (baseline, midline, and end-line). In fact, some of the variables such as trait anger and anxiety reported a gradual increase along the three phases. Due to the fact that the respondents in the control group did not receive treatment, the findings indicate that the psychological or emotional condition of the respondents either worsened or remained the same. This finding can possibly explain why there are escalating cases of students' unrest in secondary schools in Kenya despite the fact that the Ministry of Education has strengthened and empowered the guidance and counseling

departments in the schools. The schools seem to be incapacitated by the kind of approaches used to deal with students' emotions, anger being one of them.

A Friedman's Test carried out showed that there were significant differences between State anger (χ^2=84.315; p=0.000) and its associated subscale of angry feeling (χ^2=75.648; p=0.000). Significant differences were also obtained in the subscales verbal expression of anger (χ^2 =75.309; p=0.000), and physical expression of anger (χ^2=77.440; p=0.000). There were also significant differences in trait anger (χ^2=86.253; p=0.000), and its subscales angry temperament (χ^2=86.613; p=0.000), angry reaction (χ^2=88.235; p=0.000). Other variables in which significant differences were obtained included: anger expression out (χ^2=62.037; p=0.000), anger expression in (χ^2=70.412; p=0.000), anger control out (χ^2=60.082; p=0.000), anger control in (χ^2=44.408; p=0.000), anger expression index (χ^2=79.174; p=0.000), anxiety (χ^2 =79.460; p=0.000) and depression (χ^2=91.907; p=0.000). These results are shown in table 2 below.

Table 3: Friedman Test for Related Samples in the Experimental Group for the Variables under Study

VARIBALES	χ^2	P
State Anger	84.315	0.000
Angry Feeling	75.648	0.000
Verbal Expression of Anger	75.309	0.000
Physical Expression of Anger	77.440	0.000
Trait Anger	86.253	0.000
Angry Temperament	86.613	0.000
Angry Reaction	88.235	0.000
Anger Expression Out	62.037	0.000
Anger Expression In	70.412	0.000
Anger Control Out	60.082	0.000
Anger Control In	44.048	0.000
Anger Expression Index	79.174	0.000
Anxiety	79.460	0.000
Depression	91.907	0.000

Wilcoxon's non parametric test for pretest and posttest scores, pretest and follow-up scores as well at posttest and follow-up phases was done and the results presented in table 4 below.

Table 4: Pretest-Posttest, Pretest-Follow-Up and Posttest-Follow-Up Differences in the experimental group (Wilcoxon Test for Related Samples)

Variables	Pretest-Posttest		Pretest-Follow-up		Posttest-Follow-up	
	Z	P	Z	P	Z	P
State Anger	-6.156	0.000	-6.158	0.000	-0.580	0.562
Angry Feeling	-5.932	0.000	-6.028	0.000	-0.628	0.530
Verbal Expression Of Anger	-5.914	0.000	-5.929	0.000	-0.433	0.665
Physical Expression Of Anger	-5.797	0.000	-5.663	0.000	-0.093	0.926
Trait Anger	-6.163	0.000	-6.163	0.000	-0.554	0.579
Angry Temperament	-6.107	0.000	-6.152	0.000	-0.771	0.441
Angry Reaction	-6.169	0.000	-6.169	0.000	-0.153	0.579
Anger Expression Out	-5.435	0.000	-5.332	0.000	-0.958	0.338
Anger Expression In	-6.041	0.000	-5.932	0.000	-0.361	0.718
Anger Control Out	-5.230	0.000	-5.631	0.000	-1.156	0.118
Anger Control In	-4.792	0.000	-4.963	0.000	-1.252	0.210
Anger Expression Index	-6.114	0.000	-6.158	0.000	-1.295	0.195
Anxiety	-6.160	0.000	-6.158	0.000	-1.048	0.295
Depression	-6.157	0.006	-6.157	0.000	-5.354	0.000

Table 4 presents the differences obtained between the Baseline-Midline, Baseline-End-line, and Midline-End-line scores in the experimental group. In comparing the pretest and posttest, the results obtained revealed significant reductions in many of the key variables: State anger (Z=-6.156; p=0.000), angry feeling (Z=-5.932; p=0.000), verbal expression of anger (Z=--5.914; p=0.000), physical expression of anger (Z=--5.797; p=0.000). Notable significant differences were also obtained in trait anger (Z=--6.163; p=0.000), angry temperament (Z=-6.107; p=0.000), angry reaction (Z=--6.169; p=0.000), anger expression in (Z=-5.589; p=0.000), anger expression out (Z=-5.435; p=0.000), anger control out (Z=-5.230; p=0.000), anger control in (Z=-4.792; p=0.000). There was also significant differences in anger expression index (Z=-6.114; p=0.000).

Despite obtaining a statistically significant difference in anxiety (Z=-6.160; p=0.000), the reduction in depression (Z=-6.157; p=0.006) was statistically insignificant. This insignificance may be pointing to the comorbid nature of depression and the prevailing social environment at the time of collecting data at midline.

The results from this study (Table 4) also revealed significant reductions in the mean midline and end-line scores in all the variables. All these reductions were statistically significant. Similarly, a comparison of the mean posttest and follow-up scores showed no significant differences in all of the key variables except for depression (Z=-5.354; p=0.006).This significance may be pointing to the comorbid nature of depression and the prevailing social environment at the time of collecting data. The findings seem to suggest that the respondents at end-line phase were exhibiting limited symptoms of anger and were now able to cope better with their environment compared to their state prior to the intervention. This further shows that the intervention was effective in the treatment of anger, besides reducing anxiety and depression among the participants.

Similarly, like in the experimental group, the Friedman test for related samples was also performed in the control group (Table 5 below) in order to determine possible statistically significant differences in the control group in the means of the variables among the three different phases of the study. The study found statistical significant differences in angry feeling (χ^2 =16.361; p=0.000), anger expression out (χ^2 =17.925; p=0.000), and anger control out (χ^2 =19.878; p=0.000).

Table 5: Friedman Test for Related Samples in the Control Groups for the Variables Under Study

Variables	χ^2	P
State Anger	6.580	0.037
Angry Feeling	16.361	0.000*
Verbal Expression of Anger	0.822	0.663
Physical Expression of Anger	2.643	0.267
Trait Anger	8.874	0.012
Angry Temperament	3.586	0.166
Angry Reaction	8.341	0.015
Anger Expression Out	17.925	0.000*
Anger Expression In	3.083	0.214
Anger Control Out	19.878	0.000*
Anger Control In	5.545	0.063
Anger Expression Index	5.557	0.062
Anxiety	0.781	0.677
Depression	8.853	0.012

Lastly, Cohen's d was used to evaluate effect size at both the posttest and follow-up assessment using the formula;

$$\text{Effect size} = \frac{[\text{Mean of experimental group}]-[\text{Mean of control group}]}{\text{Standard Deviation calculated using the formula:}}$$

$$SD_{pooled} = \sqrt{\frac{(N_E-1)\,SD_E^2 + (NC-1)\,SD_C^2}{N_E+N_C-2}}$$

(N_E and N_C are the figures in the experimental and control groups, respectively, and SD_E and SD_C are their standard deviations)

The result obtained gives a minimum Cohen's value of 1.63 and a maximum of 4.52 and these indicated that the intervention had a large effect on the respondents. These results are presented in table 6:

Table 6: Cohen's d for Baseline-Midline, Baseline-Endline and Midline-Endline for the experimental group

Variables	Cohen's d Pretest-Posttest	Cohen's d Pretest-Follow-up
State Anger	2.50	3.65
Angry Feeling	2.64	2.74
Verbal Expression of Anger	2.11	2.70
Physical Expression of Anger	1.93	2.67
Trait Anger	4.52	4.50
Angry Temperament	3.69	3.71
Angry Reaction	3.92	2.12
Anger Expression Out	1.63	1.6
Anger Expression In	2.14	2.14
Anger Control Out	1.62	1.94
Anger Control In	2.27	1.30
Anger Expression Index	2.71	4.00
Anxiety	3.23	3.40
Depression	3.53	4.50

Discussion

The statistical analyses done revealed a steady decline in the mean of all the variables across the three phases i.e. baseline, midline, and end line of the experimental group. The findings of this study concurs with previous studies that found out that MBIs lead to a reduction in symptoms of depression in children (Liehr and Diaz, 2010), and the reduction in anxiety (Beauchemin, Hutchins, & Patterson, 2008) among these children. Since anger is linked to depression and

anxiety, the symptoms of these variables among the participants in the experimental group of this study reduced drastically after exposing them to the intervention for a period of ten weeks.

The findings of this study were also in line with Siegel's (2010) study who pointed out that mindfulness training reduces stress, anxiety and depressive symptoms besides increasing vitality and resilience. Though this study was not keen in measuring vitality and resilience, the levels of depression and anxiety reduced a great deal. These findings also confirm studies by Hoffman, Sawyer, Witt, and Oh (2010) who reported that mindfulness-based therapy reduces anxiety and depressive symptoms.

This study reported significant reduction in the symptoms of anger by the participants in the experimental group. The mean scores of the anger scales and subscales reduced by more than 50% after subjecting the participants to MBCBT. This further agrees with the findings of Polizzi (2008) and Silva (2007) who conducted a study in America and reported that an MBCBT approach for people with anger related difficulties were effective due to the fact that the approach addressed the thought processes, physiological reactions and behavioral expressions of anger in both the young and older people.

After the completion of the study, a follow-up made showed that the participants in the experimental group reported that they felt calm, relaxed and were more social than ever before hence in line with the findings of Huppert and Johnson (2010) who found out that participants subjected to MBCBT showed high levels of relaxation, calmness, and improved in their social behaviour. Though limited in the application among African population of students, MBCBT yielded similar results to those in America where when young people were exposed to MBCBT they showed results of increased relaxation and calmness (Broderick and Metz, 2009; Hennelly, 2011).

The findings of this study supported those of a previous study by Singh et al., (2011) who found out that mindfulness interventions disrupts the cycle of automatic aggressive behavior enabling students to get more focused in their academics and life in general. Besides this, the participants in this study were able to regulate their emotions and behavior after the treatment as reported by the school administration. This is in line with a previous study by Carriochi, Kashdan, Leeson,

Heaven, and Jordan (2011) who asserted that individuals exposed to MBCBT were able to live in accordance to the societal laid down laws and expectations.

The results obtained in this study yielded a minimum Cohen's value of 1.63 and a maximum of 4.52 thus indicating the intervention's very huge effect on the respondents in the experimental group. All these findings confirm that MBCBT program was effective in anger management as compared to other interventions used in secondary schools. They also support the study of Black, Milam, and Sussman (2009) who found out that MBI's have yielded satisfactory results among children and adolescents in both clinical and non-clinical samples. The findings are also in support of earlier studies that reported that MBI's lead to a reduction in symptoms of depression in children, reduce anxiety in students with learning disorders, reduce stress, improve the academic performance of learners, interpersonal relations, and boosts physical health (Liehr and Diaz, 2010; Beauchemin, Hutchins, and Patterson, 2008; Sibinga et al., 2011).

Conclusion

The participants subjected to this intervention had great gains in anger reduction, reduction of depressive and anxiety symptoms besides achieving a higher anger expression index. The reductions were statistically significant. This leads to the conclusion that MBCBT is efficacious in treating anger, anxiety and depression among secondary school students.

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