Effectiveness of group cognitive behavioral intervention in reducing test anxiety among psychology undergraduates in Kathmandu, Nepal

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Abstract

Background:

High test anxiety negatively impacts students, affecting academic performance, well-being, focus, and retention rates. Cognitive Behavioral Therapy CBT is a promising approach to reducing test anxiety, and we aimed to assess the effectiveness of group-based CBT in reducing test anxiety among undergraduate students.

Material and method:

This experimental, independent two-group design enrolled 80 test-anxious participants, randomly assigning them to a control or intervention group (40 participants each). Westside Test Anxiety Scale was the primary outcome measure, and participant's feedback was collected. The intervention group received ten sessions of group-based CBT. Baseline and endline data were analyzed and effect size was reported. Participant feedback was analyzed qualitatively.

Results:

The intervention group demonstrated 16% reduction in test anxiety score from their baseline, while the control group showed only 5.54% reduction from their baseline. In contrast, the control group showed a 2-point reduction, representing a 5.54% decrease. This difference was statistically significant (effect size= -0.53), supporting moderate effectiveness. Further, scores in specific test anxiety areas, such as worry about forgetting during the study and performance after exams, showed notable improvement. Participant feedback highlighted improved stress management, self-awareness, and understanding of emotions. Suggestions incorporating visual aids and increasing interactivity for the future.

Conclusion:

This study demonstrates utility of group-based CBT in reducing test anxiety among undergraduate students. A larger scale randomized controlled trial is needed to evaluate the effectiveness of group CBT in a larger population, and future studies can focus on examining the effect of group CBT delivered by non-specialists in a broader population.

Keywords:

Test Anxiety, Undergraduate, Group Cognitive Behavioral Therapy, Nepal.

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INTRODUCTION

Test anxiety, a form of performance anxiety seen before, during, and after testing situations [(1)], is a widespread problem [(2)]. The prevalence of test anxiety ranges as low as 18.2% [(3)] and as high as 86% [(4)]. Even though mild test anxiety enhances memory, attention, and motivation and improves test performance [(5)], a higher level of test anxiety can contribute to distraction [(6)], poor academic performance [(7, 8)], increased dropout rates [(9)], decreased test effort, cheating, and reduced motivation to learn [(10)]. High test anxiety can also affect sleep, physical health, and mental health and contribute to substance use [(11)]. Even though the prevalence of test anxiety in school and college settings is high [(12-14)] in Nepal, there is a paucity of literature exploring the evidence-based intervention of test anxiety.

Various interventions have been developed to reduce test anxiety, particularly targeting cognitive (e.g., worry and apprehension), affective (e.g., tension and perceived arousal), and behavioral (e.g., study avoidance) components of test anxiety [(15)]. Some of the practical techniques in test anxiety reduction are desensitization [(16)], stress inoculation [(17)], relaxation [(18)], biofeedback, behavioral therapy [(19)], and

cognitive-behavioral intervention[19, 20]. Of these techniques, interventions based on Cognitive-Behavioral Therapy (CBT) can address all three components of test anxiety.

In Low and Middle-Income Countries (LMIC) like Nepal, there is still a huge treatment gap in terms of psychosocial services [21] and a scarcity of human resources in the field [22, 23]. The approaches based on CBT are gaining popularity among mental health and psychosocial service providers in Nepal for helping people with various psychological problems [24]. Hence, we aimed to explore an educational-model-based group CBT proposed by Flaxman, Bond, and Keogh in 2002 [15] with the purpose of exploring an effective way of helping university students with exam-related stress and anxiety. This model is a ten-session structured group intervention, including cognitive and relaxation techniques. Such a group-based and educational-based model of imparting CBT skills to students will have multifold benefits in the context of Nepal. Firstly, group interventions are economical, as they can benefit many students simultaneously, and delivering intervention demands fewer human resources than individual interventions. Secondly, structured and skill-based group interventions can be easily trained to non-specialists to deliver in the community in a scalable way. Such an approach helps in task shifting [25], which means delivering services by less trained non-specialists. Thirdly, education-based models are more compatible with being implemented in educational institutions like schools and colleges. Further, group-based interventions effectively reduce test anxiety among school and college students [26-28]. Using structured protocol can also reduce barriers to effective psychosocial intervention, as they help minimize distress, anxiety, and confusion among clients from some cultures [29].

Hence, this study aims to assess the effectiveness of group-based CBT to reduce test anxiety, in terms of change in test anxiety scores, and participants' acceptance of intervention.

MATERIAL AND METHODS

Study Design

This experimental design adopted an independent-two-group design. Research approval was sought from the Central Department of Psychology, Tribhuvan University (Ref. No.: 130-76-77), and the trial was registered at Clinical-Trials.gov (NCT04500340).

Participants and sample size

Participants were undergraduate university students enrolled in two conveniently selected colleges in Kathmandu with psychology and social work majors affiliated with Tribhuvan University. Tribhuvan University is the largest university, enrolling 75.94% of Nepal's university-level students [30]. Inclusion criteria for recruitment were a score of three or more on WTAS, age 18 years or above, and providing consent to participate. Given that previous interventions targeting test anxiety involved sample sizes of 40 or fewer for each group [3,16,17], we targeted 40 participants for the treatment group. Hence, 80 students were assigned to either the intervention or control groups through simple random sampling, i.e., the lottery method.

Intervention

We conducted a 10-session group-based CBT program over five weeks, with two sessions weekly for 10 participants. It was based on the protocol by Flaxman, Bond, and Keogh suggested in 2002 [15]. The first and second authors prepared presentation slides and required resources after permission from the original author of the intervention protocol. For instance, we developed a progressive muscular relaxation script based on reviews and practices in Nepal and uploaded an audio recording to YouTube for easy participant access. All sessions were in a skill training module consisting of 50 minutes of training and a 10-minute Q&A. It covered stress awareness, stress management, cognitive-behavioral concepts, relaxation, worry management, meta-belief modification, problem-solving, and imagery techniques. It concluded with a review in the last session.

Instruments

Westside Test Anxiety Scale (WTAS) was used to assess test anxiety [31]. WTAS has a five-point Likert scale ranging from "never true" [1] to "always true" [5]. A total score is obtained by adding scores in 10 statements and then dividing it by 10. A higher score indicates higher test anxiety. WTAS has already been translated into Nepali [12]. The present study's internal consistency, measured through coefficient alpha, revealed a reasonably good alpha value (0.81).

Participant feedback on group CBT was collected using online Google Forms. The questions in the form primarily focused on whether and to what extent training was beneficial, what training components they liked most, and what suggestions they had for the future.

Procedure

The study was conducted from February 20, 2019, to July 1, 2019. After baseline screening and allocating participants to the control or intervention group, we explained in detail about participation in the intervention to them. Detailed

information about their participation and the session's structure was discussed with participants in the intervention group. Then 10-session group CBT started and control groups were informed that they would get the intervention (on demand) after completing the end-line survey. Altogether 75 participants completed the end-line survey (35 in the intervention group and 40 in the control group), only 20 out of 35 participants in the intervention group responded to the feedback form of intervention. The fourth author did the baseline and end-line survey on college premises.

Data Analysis

The participants who completed the baseline and post-treatment assessment (n=35 for CBT group and n=40 for control group) were only included in the analysis. The data were coded in Microsoft Excel and then imported to Statistical Package for Social Science (Version 21). The baseline characteristics of the participants were compared using the chi-square test for categorical data and an independent t-test for continuous data. Crude mean change scores were calculated as the difference in baseline and post-assessment. They were compared with independent t-tests (two-tailed).

The effect size was calculated for groups with unequal sample sizes by adjusting the calculation of the pooled standard deviation with weights for the sample sizes. It is also similar to Cohen's d [32]. In addition, Wilcoxon signed-rank test was used to compare item-wise change in WTAS in two timelines among both groups.

Repeated reading provided specific codes, categories, and themes for the qualitative data generated through four open-ended participant feedback questions. The summary is reported as a qualitative report.

RESULTS

Baseline Characteristics

Most participants were female students (80% in the CBT group and 82% in the control group). Participants' age ranged from 18 to 26 years. They were studying in the first or second year at the bachelor's level. Chi-square tests and independent-sample t-tests indicate that both groups' baseline characteristics were similar (Table 1). Baseline test anxiety scores were also comparable between groups.

Table 1. Baseline sociodemographic and clinical characteristics of the participants [a]

Characteristic	CBT group (n=35)	Control group (40)	Statistics
Female	28 (80.0%)	33 (82.5%)	X2=.077, p=.782
Age mean (SD) [range]	19.74 (1.44) [18-23]	20.15 (2.05) [18-26]	t=-.979, df=73, p=.331
College			
KK	15 (42.9%)	20 (50.0%)	X2=.383, p=.536
MG	20 (57.1%)	20 (50.0%)	
Year			
1st year	21 (60.0%)	21 (52.5%)	X2=.426, p=.514
2nd year	14 (40.0%)	19 (47.5%)	
WTAS mean (SD) [range]	36.46 (4.38) [30-45]	36.08 (4.67) [30-46]	t=.364, df=73, p=.717

Note: [a] Table includes only data of participants who completed follow-up assessment

Outcomes between Baseline and End-line

During baseline and end-line, the mean test anxiety score was 36.46 vs. 30.60 for the intervention group and 36.08 vs. 34.08 for the control group. Hence, the mean test anxiety score change from pre to post-intervention for the intervention group was 5.85 (95% CI, 2.86 to 8.85), with a 16% symptom reduction from baseline to follow-up. The change was only 2 points (95% CI, .28 to 3.97) or a 5.54% reduction in test anxiety scores in the control group. There was a more considerable reduction in test anxiety scores in the CBT group, and this is statistically significant (p<.05). The effect size was medium, with a value of -0.53 (Table 2).

Table 2. Comparisons of mean changes between treatment conditions

Outcome	CBT group (n=35)				Control group (n=40)					T (df); p	Effect[a] Size
	Mean (95% CI)		Change, %	Mean Change (95% CI)	Mean (95% CI)		Change, %	Mean Change (95% CI)	Mean Change Difference		
	Baseline	Post-assessment			Baseline	Post-assessment					
WTAS score	36.46 (34.95 to 37.96)	30.60 (27.83 to 33.37)	16	5.85 (2.86 to 8.85)	36.08 (34.58 to 37.57	34.08 (31.87 to 36.28)	5.54	2.00 (.28 to 3.97)	3.85	2.29 (73); .024	-0.532

[a]Effect size has been calculated for groups with unequal sample size, by adjusting the calculation of the pooled standard deviation with weights for the sample sizes. It is also similar to and commonly called as Cohen's d (Lehhard & Lenhard, 2016).

Among the 35 participants in the intervention group, the percentage of participants reporting a reduction in 10 different problem items during end-line assessment ranged from 41.7 to 66.7, while among 40 participants in the control group, it ranged from 28.2 to 56.4 (Table 3). Most participants in the intervention group reported change in the second item (66.7 %, worrying about forgetting during the study) and the ninth item (61.1%, worrying about performance after the exam).

Table 3. Change of items of Westside Test Anxiety Scale between baseline and end line

	Items (paraphrased)	Participants reporting reduced problem		Wilcoxon Signed Ranks Test			
				Intervention		Control	
		Intervention (%)	Control (%)	Z	p	Z	p
1	Difficulty concentrating before exam	52.8	38	-2.297[b]	.022	-1.360[b]	.174
2	Worrying about forgetting during study	66.7	33.3	-3.026[b]	.002	-1.736[b]	.083
3	Worrying about performance during exam	52.8	56.4	-2.685[b]	.007	-1.747[b]	.081
4	Lose focus and forget during exam	55.6	48.7	-3.048[b]	.002	-1.899[b]	.058
5	Remember answer only after exam	50	46.2	-1.648[b]	.099	-1.424[b]	.155
6	Worn out due to worry during exam	41.7	38.5	-.479[b]	.632	-.821[b]	.411
7	Feel out of sorts during exam	55.6	28.2	-2.467[b]	.014	-.301[c]	.763
8	Wandering mind during exam	47.2	36.8	-1.876[b]	.061	-.165[c]	.869
9	Worry about performance after exam	61.1	35.9	-3.041[b]	.002	-1.054[b]	.292
10	Worry or avoid writing assignments	44.4	28.2	-.929b	.353	-.093[c]	.926

a. Wilcoxon Signed Ranks Test b. Based on positive ranks. c. Based on negative ranks.

As per the Wilcoxon matched-pairs signed rank test, there was significant improvement (i.e., reduction in problem reporting) in 6 items. However, there was little sign of any improvement ($p > 0.05$) in the fifth item (remember answer only after exam); sixth item (worn out due to exam); eighth item (wandering mind during exams); and tenth item (worry or avoid writing assignments). As expected, there was no significant improvement in any items among the control groups ($p < 0.05$).

Participant satisfaction

Twenty out of 35 participants responded to online feedback. They shared that they benefitted from the intervention. In a Likert rating of 0 (least beneficial) to 5 (most beneficial), the average rating was 3.9 ± .64. They were willing to recommend the intervention package to other students in need.

The qualitative data has been summarized into four themes:

i) Facilitator and the delivery: They perceived the facilitators to be proactive and cooperative. They also shared that training delivery was smooth and convenient for them.

"The way of training method……precise and effortless" (#04)

One shared that visual aids could have made training much livelier. They also shared about interactive sessions as useful. One shared that such interactions and homework need to be increased.

"It would have been better if the training lasted for longer period with more tasks/homework and more interaction because I think that would have helped us to get habituated with all the techniques and would have given us the clearer idea of using the right technique at right time." (#03)

ii) CBT techniques: Participants liked the technique of identifying negative thoughts, the use of questions to challenge these thoughts, and imagery techniques.
"Identifying negative thoughts and questioning if the thoughts are relevant has been helping me a lot not only for my exam anxiety but also for my other anxieties in general. This training has made me more solution focused and I have been using the pros and cons techniques which are very much helpful. The imagery techniques are the easiest and most impactful technique to deal with stress." (#03)

iii) Benefit of training: Besides exam anxiety, the participants shared that it helped them manage their stress, be aware of themselves and their feelings, and explore the mechanism of distress in general.
"I got to know about the thinking process of our mind. It makes me aware about the reason behind my own feeling." (#11)

iv) Recommendation for future: Some participants were not regular. Hence, there were suggestions that regularity needs to be addressed during future training. Another recommendation was for the use of videos or other visual aids during training. There could be more group discussions where participants could discuss how every individual is coping with anxiety and at what level they are feeling it.

DISCUSSION

This study, conducted to explore the effectiveness of group CBT in reducing test anxiety among psychology undergraduates studying in various colleges in Kathmandu, showed group CBT as an effective intervention to reduce test anxiety. Results indicated that the effect of group CBT was moderate in the reduction of test anxiety scores, and the participants shared satisfaction with the intervention provided. The findings highlight the substantial impact on specific areas of concern, such as worrying about forgetting during study and performance anxiety after exams. There is a significant improvement, with a reduction in problem

reporting, for six items originally categorized as 'worry' or 'catastrophizing' by Driscoll [31] within the intervention group. Feedback from participants indicates that the approach of facilitators, group format and overall intervention was acceptable and useful.

The findings of this study that group CBT is an effective method for the management of test anxiety is consistent with various meta-analyses [19, 20, 33] and other reports [34-37]. The result was consistent with other similar studies conducted in natural educational context [26, 27].

This finding adds preliminary evidence of group CBT in LMIC, especially in the South Asian context. Studies in India and Pakistan have utilized interventions other than CBT (for example, guided mastery, hypnosis, and mandala coloring) [19, 38, 39]. Our study focused on evidence of educationally based group CBT, which indicates that it is feasible to implement evidence-based practices in a lower-resource setting. This study provided evidence for the low-cost group CBT in LMIC.

The study has some limitations. Firstly, the post-intervention assessment was completed only two-week after the completion of the intervention. Thus, the long-term impact of the intervention is unknown. However, previous studies have reported the effectiveness of group CBT maintenance even for two years or above [26, 40]. Secondly, interventions were carried out in traditional college settings, and thus other distractors at colleges can have influenced the effectiveness of training. However, earlier researchers have reported the effectiveness of the intervention in a natural ecological context [26, 27]. Also, we observed a medium effect size of test anxiety intervention despite this limitation. Thirdly, we did not consider the effect of gender on outcomes due to disproportionately more female than male students. Gender differences in the impact of mindfulness activity have been reported in the study of Carsley, Heath, and Fajnerova [41]. Assessment of treatment fidelity was not included, and assessors were not blinded to treatment status. Finally, we did not regard the role of other variables like maturation and pretest sensitization [42], which can influence internal validity. Future research is warranted to explore gender differences in treatment effectiveness, the long-term effect of group CBT on test anxiety, and the effectiveness of group CBT in the school population. This study In addition, definite guidelines of cross-cultural adaptation of scalable psychological intervention could have been followed during protocol adaptation [43].

Despite these limitations, the study is the first to carry out the role of psychological intervention in test anxiety in Nepal. This study can provide evidence for test anxiety intervention in a setting where non-evidence-based interventions are prevalent [25]. Also, since test anxiety influences immediate and future functioning, early interventions can be important [40].

The study shows that group-based intervention of test anxiety is possible in natural educational settings and implicates the possibility of a larger-scale trial. Such extended randomized controlled trials can also examine whether inoculation of such training a few months before an examination can benefit students. The intervention's structured nature makes it possible to be run by trained non-experts, psychology students, and counseling psychology students. It is also noteworthy that in the fifth item (remembering the answer only after the exam), the sixth item (feeling worn out due to exams), the eighth item (experiencing a wandering mind during exams), and the tenth item (worrying or avoiding writing assignments), there was little evidence of improvement. These items related to 'Incapacity' represent memory loss and poor cognitive processing, as proposed by Driscoll in 2007 [31]. Further studies can explore either the utility of these items in measuring test anxiety or the effect of the intervention on these aspects of test anxiety.

CONCLUSIONS

A high rate of test anxiety, scarce human resources, and lack of evidence-based test anxiety intervention in the Nepalese context demand the need for thorough intervention evaluation. This small-scale study shows that group CBT can bring about a moderate reduction in test anxiety among undergraduate students and thus indicates the feasibility of a full trial to ascertain the effectiveness of group CBT. A full trial can provide information about the intervention's effectiveness and cost-effectiveness. This study also demands that universities consider the investment of such training for the benefit to their students in reducing test anxiety.

FUNDING SOURCE:

The research was funded by the University Grants Commission of Nepal (Small RDI, 2017; Award No. SDRI-73/74-H & S-02).

ACKNOWLEDGMENTS

The authors thank the University Grants Commission of Nepal for providing the funds to conduct research (Small RDI, 2017; Award No. SDRI-73/74-H & S-02). The first (corresponding) author obtained the grant.

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