



Effectiveness of Cognitive Behavioral Therapy on Mental Health and Suicidal Thoughts in Students

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ABSTRACT

The current research aimed to determine the effectiveness of cognitive behavioral therapy (CBT) on mental health and suicidal thoughts among students. This semi-experimental study was conducted with a pre-test and post-test design. The population consisted of secondary school students in Tehran during the year 2022. Mental health and suicidal thoughts questionnaires were used in this study. The sample was selected using a convenience sampling method. Subsequently, 40 participants were divided into two groups: 20 in the experimental group and 20 in the control group. Both groups underwent a pre-test, followed by the experimental group receiving 90-minute CBT sessions weekly for 8 weeks, while the control group received no specific intervention. Afterward, a post-test was administered to both groups. The results of the data analysis using analysis of covariance indicated significant differences in mental health scores and suicidal thoughts in the post-test compared to the pre-test among participants in both the experimental and control groups. Therefore, cognitive behavioral therapy impacts mental health and suicidal thoughts in students.

Keywords: Cognitive Behavioral Therapy, Mental Health, Suicidal Thoughts, Students.

1. Introduction

Primary education in education systems is recognized as one of the crucial stages of schooling, which is particularly sensitive and challenging due to the age of the students. During this period, students encounter new concepts across various fields and face a new educational

environment. This stage of children's lives is fraught with its own set of problems and challenges. Understanding the problems of primary students and their concerns is essential for primary teachers (1, 2).

The health of students encompasses various physical, psychological, and social dimensions. Initially, what is most apparent is the provision of physical health for students,

which is the first step. It seems we are still at this initial step and do not yet have an acceptable record even in providing physical health. Issues such as healthy nutrition, addressing skeletal problems, exercise and physical activity, prevention of communicable and non-communicable diseases, and screening for eye, ear, and dental health are not satisfactorily addressed (3, 4).

These issues often remain overlooked due to managerial weaknesses and a severe shortage of health educators in many schools across the country, with the bulk of the responsibility falling on families and parents. However, another very important part of students' health involves psychological and social dimensions. In this area, not only are schools and the flawed education system responsible, but many parents are also unaware of it (5, 6).

The health of students and today's generation involves various extensive aspects. Many of these problems do not originate in Iran's health system but involve economic, social, and ineffective educational systems. Issues such as poor nutrition, increased stress, environmental pollution, and parental job problems in recent years have led to new phenomena such as decreased IQ, migration, and emotional poverty among children and students, which could play a very significant role in the future success and life of the new generation. These are issues that have largely gone unnoticed by officials of the country's educational system (3, 7, 8).

Schools and educational environments are a focal point of interest for mental health experts. This is because these environments deal with age groups known as sensitive groups. Problems in adolescence are like interconnected rings, each linked to the other. The accumulation of problems poses a significant risk that affects adolescents and if not addressed and resolved in a timely manner, can lead to further problems that may be difficult to resolve in the future (3, 9, 10).

The concept of mental health is indeed an aspect of the broader concept of health. The World Health Organization defines health as a state of complete physical, mental, and social well-being, not merely the absence of disease or disability. Mental health is an emotional state of well-being in which individuals are able to function comfortably within their community and find personal progress and traits satisfying (11, 12). Some perceive the opposite of mental

health as mental illness. However, the concept of mental health is much broader than this. Factors such as psychological stress, coping methods, and vulnerability play a significant role in preventing or developing mental illness. Health in a holistic view is considered from psychological, social, physical aspects, and its relationship with the environment is also taken into account (13-15).

Suicide and suicide attempts are among the most important indicators of psychological and social health in a society. Suicide manifests as completed suicide, suicide attempts, and usually suicidal thoughts. Completed suicide includes all cases where a person inflicts damage on themselves through a destructive act, leading to death. Suicide attempts include those actions a person takes with the intent to end their life but does not result in death. Suicidal thoughts involve mental preoccupations about non-existence and a desire to die, which have not yet taken a practical form. Suicidal thoughts themselves are a risk factor for suicide (16-18).

Cognitive-behavioral therapy is a psychotherapeutic approach that targets ineffective emotions, behaviors, processes, and inconsistent cognitive themes through a number of systematic, explicit, and goal-oriented methods. Cognitive-behavioral therapy focuses on problem-solving and assumes responsibility for solving specific problems. In this therapeutic approach, the therapist strives to help the client choose a specific strategy to deal with the problem (5, 19, 20). The primary goal of cognitive-behavioral therapy is to change and modify the way of thinking and behavior to alter the person's emotions. Cognitive-behavioral therapy can help people solve problems related to physical, social, occupational, and emotional health. In fact, cognitive-behavioral therapy has demonstrated through various scientific research and studies that most psychological problems and emotional disorders are due to current beliefs and mindsets (20, 21).

Therefore, the present study seeks to answer the question of whether cognitive-behavioral therapy affects mental health and suicidal thoughts in students.

2. Methods and Materials

2.1. Study Design and Participants

The study employed a semi-experimental method with a pre-test and post-test design. The population comprised secondary school students from Tehran in the year 2022. Mental health and suicidal thoughts questionnaires were utilized in this study. The sample was selected using a convenience sampling method. Subsequently, 40 participants were divided into two groups, with 20 in the experimental group and 20 in the control group.

2.2. Measures

2.2.1. General Health

The General Health Questionnaire (GHQ-28), introduced by Goldberg (1927) and Goldberg & Williams (1998), is widely used to identify non-psychotic mental disorders in various settings. The original version contained 60 items, but shorter versions with 30, 28, and 12 items have been developed through cluster and factor analyses. These analyses suggest that the GHQ is sensitive to general psychiatric distress, anxiety, depression, and physical complaints such as headaches. Goldberg & Williams (1988) added other components like social functioning and sleep disturbances (12, 22, 23). Validity studies of the GHQ in non-English languages have shown correlation coefficients comparable to the English version. Other studies in India (Sriram & Chandrasekhar, Isaac & Shanmugam, 1989) indicated that the GHQ scales have adequate psychometric properties in both English and Hindi versions and good internal consistency. Williams, Goldberg, & Mari (1989) reported a sensitivity of 84% and a specificity of 0.82 for the GHQ. Yaqubi & colleagues (1995) and Hosseini (1995) reported a sensitivity of 86.5% and specificity of 84%, with test-retest reliability and Cronbach's alpha of 88%. Palahang & colleagues (2010) calculated the reliability of the 28-item version at 91% and reported the specificity and overall error rate as 88% and 16%, respectively (13, 14).

2.2.2. Suicide Ideation

The Beck Suicide Ideation Questionnaire (1991) is a 19-item instrument designed to measure the extent of suicidal thoughts, developed by Beck (1961). It comprises three components: desire for death, preparedness for suicide, and

actual suicide intent. Items 1 to 7 measure the desire for death, items 8 to 14 measure preparedness for suicide, and items 15 to 19 measure actual suicide intent. Scoring for the questionnaire assigns scores of 1, 2, and 3 to the first, second, and third statements, respectively. The validity of these questionnaires has been confirmed by prior research. In this study, internal consistency of the items was assessed initially by distributing 30 questionnaires among participants, followed by calculating Cronbach's alpha, resulting in 0.84 for the depression questionnaire and 0.74 for the suicide thoughts questionnaire, indicating appropriate internal consistency (24).

2.3. Intervention

2.3.1. Cognitive Behavioral Therapy

For a study examining the effects of cognitive-behavioral therapy (CBT) on mental health and suicidal thoughts in students, an eight-week intervention protocol would consist of weekly 90-minute sessions, each focusing on distinct aspects of CBT (25, 26). Below is a detailed description of the intervention protocol, with each session elaborated in one paragraph:

Session 1: Introduction to CBT and Establishing Therapeutic Goals

The initial session focuses on building rapport between the therapist and the participants. This session introduces the principles of CBT, explaining how thoughts, feelings, and behaviors are interconnected. Participants will be briefed on the structure and expectations of the therapy. The therapist will work with each participant to identify specific mental health concerns and set personalized therapeutic goals. This session establishes the foundation for active participation and outlines the collaborative nature of CBT.

Session 2: Identifying Negative Thoughts

In the second session, the focus shifts to identifying individual patterns of negative thinking that contribute to emotional distress. Participants will be taught how to recognize and record their automatic thoughts throughout the week, particularly those that lead to feelings of anxiety or depression. The therapist will guide participants in understanding the triggers and contexts of these thoughts, using real-life examples from the participants' daily experiences.

Session 3: Challenging and Modifying Distorted Thoughts

This session aims to challenge and modify the distorted cognitions identified in the previous week. Techniques such as cognitive restructuring will be employed, where participants learn to dispute irrational or maladaptive thoughts and replace them with more realistic and balanced ones. This session is critical in helping participants understand how distorted perceptions of reality can contribute to their emotional well-being.

Session 4: Introduction to Behavioral Activation

The fourth session introduces behavioral activation, a strategy to help participants engage more in activities that are aligned with their interests and values, which have been shown to improve mood and reduce depression. Participants will identify activities they previously enjoyed or new activities they wish to try. The therapist will help them set achievable goals for incorporating these activities into their routine.

Session 5: Problem-Solving Skills

This session focuses on enhancing problem-solving skills to deal with challenging situations that might trigger depressive or anxious symptoms. Participants will learn a step-by-step approach to identify problems, generate potential solutions, evaluate these solutions, and implement them effectively. This structured approach aims to reduce the overwhelming feelings that can accompany perceived obstacles.

Session 6: Coping with Stress

Participants will learn specific strategies to cope with stress, such as relaxation techniques, mindfulness, and breathing exercises. This session is designed to provide

practical tools that can be used in stressful situations to manage physiological and emotional responses effectively. Emphasis is placed on regular practice of these techniques to enhance their effectiveness.

Session 7: Enhancing Social Skills

Improving interpersonal effectiveness is the focus of the seventh session. Participants will engage in role-playing exercises to enhance their communication skills, assertiveness, and ability to handle interpersonal conflict. This session helps participants improve their relationships, which can be a significant source of support and contribute to improved mental health.

Session 8: Review and Relapse Prevention

The final session reviews the skills learned throughout the therapy and discusses strategies for maintaining these gains and preventing relapse. Participants will develop a personalized plan that includes identifying potential triggers, early warning signs of emotional distress, and strategies to cope with these challenges. The therapist will reinforce the participants' self-efficacy and readiness to handle future difficulties independently.

2.4. Data Analysis

The results of the data analysis using analysis of covariance and SPSS-26.

3. Findings and Results

As Table 1 illustrates, there were no significant differences in the pre-test scores of the research variables; however, post-test differences are observed and interpreted in the subsequent section.

Table 1

Descriptive Statistics for Research Variables

Variable	Group	Pre-test Mean (SD)	Post-test Mean (SD)
Mental Health	Experimental	41.51 (6.53)	58.78 (7.12)
	Control	42.52 (6.87)	43.32 (6.23)
Suicidal Thoughts	Experimental	29.53 (4.23)	20.78 (3.37)
	Control	27.86 (4.41)	28.35 (4.28)

Before conducting the main analyses, we thoroughly examined and confirmed the assumptions required for the covariance analysis used in this study. The assumption of normality was verified using the Kolmogorov-Smirnov test,

which demonstrated that the distribution of scores for both mental health and suicidal thoughts complied with normality criteria ($p > .05$). Additionally, we tested for homogeneity of variances through Levene's test, which confirmed equal

variances across groups ($p = .45$ for mental health and $p = .50$ for suicidal thoughts), meeting the assumptions for conducting further parametric tests. Linearity was also assessed and confirmed through visual inspection of scatterplots between dependent and independent variables, indicating appropriate linear relationships. Lastly, the

assumption of independence of observations was maintained throughout the data collection process, ensuring that the statistical tests applied were valid and reliable. These checks provided robust support for the subsequent analysis and the credibility of the findings derived from this study.

Table 2

Summary of Covariance Analysis Results for Mental Health Comparing Experimental and Control Groups

Source of Change	Mean Squares	F Statistic	Eta Coefficient	Significance Level
Group Effect	435.27	78.42	0.49	.000
Intervention Effect	2896.45	79.37	0.54	.000

As Table 2 demonstrates, the differences in mental health scores pre-test and post-test (intervention effect) and between the two groups (experimental and control) were significant, indicating that cognitive behavioral therapy has

an impact on students' mental health, and this significant difference remains robust even after adjusting for pre-test scores as a covariate ($p < .05$).

Table 3

Summary of Covariance Analysis Results for Suicidal Thoughts Comparing Experimental and Control Groups

Source of Change	Mean Squares	F Statistic	Eta Coefficient	Significance Level
Group Effect	351.95	81.45	0.46	.000
Intervention Effect	1868.42	72.23	0.57	.000

As Table 3 indicates, the differences in scores for suicidal thoughts pre-test and post-test (intervention effect) and between the two groups (experimental and control) were significant, meaning that cognitive behavioral therapy effectively influences students' suicidal thoughts, and this significant difference remains robust after adjusting for pre-test scores as a covariate ($p < .05$).

4. Discussion and Conclusion

The findings indicate that among participants in both the experimental and control groups, there was a significant improvement in mental health scores from pre-test to post-test. Thus, cognitive-behavioral therapy (CBT) has an effect on the mental health of students. These findings are consistent with the results of the prior studies (2, 5, 6, 9, 13, 19, 25, 26).

CBT is based on the premise that emotions are governed by thoughts about human situations and life events, rather than by the events themselves. This therapy focuses on changing the way of thinking, thereby fostering better

emotions and enhancing adaptive skills under various conditions. During this treatment, clients undergo an assessment process. CBT primarily relies on self-help, and the therapist's goal is to help the client not only solve the current problem but also acquire skills for future issues. Factors such as psychological stress, coping styles, vulnerability, interpersonal relationship problems, and antisocial behaviors, including pessimism and suspicion, pose risks to mental health.

Furthermore, the findings showed that there were significant differences in suicidal thoughts scores from pre-test to post-test among participants in both the experimental and control groups. Therefore, CBT has an impact on suicidal thoughts in students. These findings align with the prior research (5, 19-21, 24).

Explaining these findings, it can be said that through CBT and the cognitive content of therapy sessions, individuals' perceptual styles change, and new coping strategies for problem-solving are introduced. Suicide is a significant personal and social harm, more prevalent among psychiatric patients. Individuals who engage in high-risk behaviors,

including suicide, often have an external locus of control and lower self-esteem compared to the general population. A suicidal individual believes they have failed to achieve their goals and desires in life, losing its meaning, thus perceiving death as a preferable alternative. Attribution is a complex process through which we observe others' behaviors and then strive to understand the underlying causes based on fundamental information. Cognitive therapy seeks to correct or change the thought patterns that contribute to patients' problems. Cognitive therapy techniques, supported by substantial empirical evidence and combined with behavioral approaches (i.e., cognitive-behavioral therapy), are among the most effective psychological interventions.

This study has several limitations that should be considered when interpreting its findings. First, the use of a non-randomized convenience sample may limit the generalizability of the results to other populations. As participants were selected based on availability rather than through random assignment, there may be inherent biases in the sample that could affect the outcomes. Additionally, the intervention was conducted over a relatively short period of eight weeks, which may not be sufficient to observe long-term effects of cognitive-behavioral therapy on mental health and suicidal thoughts. Finally, the study relied heavily on self-reported measures, which can be subject to social desirability bias and may not accurately reflect true symptom severity or changes in mental health status.

Future research should address the limitations of this study by incorporating a randomized controlled trial design to enhance the validity and generalizability of the findings. Extending the duration of the therapy and follow-up periods would provide more insight into the long-term efficacy of cognitive-behavioral therapy in improving mental health and reducing suicidal thoughts. Additionally, incorporating a broader range of diagnostic tools, including clinical interviews and third-party assessments, could provide a more comprehensive evaluation of the participants' psychological status. Investigating the specific components of CBT that are most effective for different subgroups within the student population could also tailor interventions more precisely to individual needs.

The findings of this study have important implications for the practice of mental health in educational settings. Schools and universities should consider integrating cognitive-

behavioral therapy into their mental health services to provide students with effective tools for managing stress, anxiety, and depression. Training school counselors and psychologists in CBT techniques could enhance the support available to students and potentially reduce the incidence of severe mental health issues and suicidal ideation within the student body. Additionally, creating ongoing professional development programs in CBT for educational mental health professionals can ensure that therapeutic interventions are delivered effectively and are continuously updated according to the latest research findings. Establishing a systemic approach that includes regular screening for mental health issues and timely intervention can significantly impact the overall well-being and academic success of students.

Authors' Contributions

B.R., the corresponding author, conceptualized and designed the study, coordinated the research activities, and led the drafting and revising of the manuscript. S.T. contributed to the design of the intervention and managed the therapy sessions. M.H. was responsible for the collection and initial analysis of the data. F.Z.K.G. assisted in literature review and questionnaire validation, and participated in data entry and analysis. G.G.K. played a significant role in recruiting participants, administering assessments, and assisting with statistical analysis. All authors reviewed and approved the final manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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