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The Efficacy of Cognitive Behavioral Therapy on Mental Health, Self-esteem and Emotion Regulation of Medical Students with Imposter Syndrome

Farzin Bagheri Sheykhangafshe [1,*], Elahe Nouri [2], Vahid Savabi Niri [3], Mersad Choubtashani [4], Hojjatollah Farahani [5]

[1] Faculty of Humanities, Tarbiat Modares University, Tehran, Iran
[2] Islamic Azad University of Roudehen Branch, Roudehen, Iran
[3] Islamic Azad University of Ardabil Branch, Ardabil, Iran
[4] Imam Khomeini International University, Qazvin, Iran
[5] Department of Psychology, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran

[*] *Corresponding author:* Faculty of Humanities, Tarbiat Modares University, Tehran, Iran. Email: farzinbagheri73@gmail.com

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Abstract

Background: Medical students often experience self-doubt due to the demanding nature of their coursework and numerous assignments, which may indicate Imposter Syndrome (IS).

Objectives: This study aimed to evaluate the effectiveness of cognitive behavioral therapy (CBT) in improving mental health, self-esteem, and emotional regulation among medical students dealing with IS.

Methods: A semi-experimental design was used, incorporating a pre-test-post-test approach with a control group. The statistical sample included medical students from Tarbiat Modares University in 2023. A total of 36 students were selected through purposeful sampling and randomly assigned to either the experimental group (n = 18) or the control group (n = 18). Data collection tools included questionnaires assessing IS, mental health, self-esteem, and emotion regulation. The experimental group received eight 90-minute CBT sessions based on the approach by Egan and Shafran (2017), while the control group received no intervention. Data were analyzed using a multivariate analysis of covariance with SPSS24 software.

Results: The results showed that CBT significantly reduced expressive suppression ($F = 78.04$, $\eta^2 = 0.72$) and increased mental health ($F = 37.73$, $\eta^2 = 0.56$), self-esteem ($F = 54.76$, $\eta^2 = 0.64$), and cognitive reappraisal ($F = 35.65$, $\eta^2 = 0.55$) among students with IS ($P < 0.001$).

Conclusions: The findings suggest that CBT is an effective intervention for improving the psychological well-being of medical students experiencing IS. The significant improvements in mental health, self-esteem, and emotional regulation underscore CBT's potential as a valuable tool for this population.

Keywords: Imposter Syndrome, Cognitive Behavioral Therapy, Mental Health, Self-esteem, Emotion Regulation

1. Background

In the ever-evolving landscape of academia and professional pursuits, Imposter Syndrome (IS) has emerged as a significant psychological challenge for many medical students (1). Despite their evident accomplishments and abilities, individuals grappling with IS often experience persistent feelings of inadequacy and a pervasive fear of being exposed as fraudulent or incompetent (2). For medical students, the effects of IS can be particularly detrimental. The constant pressure to excel and the competitive nature of medical school can exacerbate feelings of inadequacy and self-criticism. Students with IS may attribute their successes to luck rather than ability, leading to a chronic fear of failure and being unmasked as incompetent (3). Imposter Syndrome manifests in various ways, including self-doubt, perfectionism, and an inability to internalize one's achievements (4). Wang et al. (1) found

that 62.8% of medical students and 57.2% of residents experienced significant or severe levels of IS.

The impact of IS extends far beyond mere academic performance, affecting every aspect of students' lives, including their mental health (5). The relentless cycle of self-doubt and perfectionism perpetuated by IS can profoundly impact students' psychological resilience, leading to heightened levels of stress, anxiety, and even depression (6). Additionally, the stigma surrounding mental health in academic environments often exacerbates the challenges faced by students with IS (7). Fearing judgment or dismissal, many students suffer in silence, hesitant to seek help or support for fear of being perceived as weak or incapable (8). In a study involving 169 Russian college students, Wang et al. (7) discovered that IS acted as a complete mediator in the association between perfectionism and anxiety and a partial mediator in the association between perfectionism and depression.

Imposter Syndrome, like a shadow cast over academic pursuits, undermines students' confidence and sense of self-esteem (9). Despite their academic achievements, individuals afflicted by this phenomenon harbor a deep-seated belief that they are undeserving of their successes (10). Instead of celebrating their accomplishments, they view them as mere results of external factors rather than their own abilities (11). This relentless cycle of self-doubt and questioning takes a toll on students' self-esteem, eroding their confidence and distorting their perceptions of their capabilities (12). Nanda's findings (9) suggest a prevalent occurrence of IS among these students, with both self-esteem and locus of control significantly associated with feelings of IS.

One of the key emotional struggles associated with IS is the difficulty in managing feelings of inadequacy and unworthiness (13). Despite external validation of their achievements, individuals grappling with IS often struggle to internalize their success, leading to heightened levels of stress, anxiety, and self-doubt (14). These negative emotions can become overwhelming, making it challenging for individuals to regulate their emotional responses in a healthy and constructive manner (15). Moreover, the fear of being "found out" as a fraud can trigger intense feelings of anxiety and impostor-related distress, further complicating the process of emotion regulation (16). LaPalme et al. (13) explored the prevalence and impact of IS among pre-service educators, revealing that a significant number of them experience moderate to severe levels of imposter thoughts, which negatively impact their well-being.

Disregarding IS among medical students can lead to various psychological, social, and academic ramifications (4). Addressing this issue, cognitive behavioral therapy stands out as a potent psychological intervention. Cognitive behavioral therapy has emerged as a promising approach to addressing the challenges posed by IS (17). This therapeutic approach emphasizes identifying and challenging negative thought patterns and beliefs, which are pivotal to the experience of IS (18). Several studies have explored the effectiveness of CBT interventions specifically tailored to address IS, yielding encouraging results (19). Research suggests that CBT can be effective in reducing the symptoms of IS by targeting the underlying cognitive distortions and maladaptive coping strategies associated with this phenomenon (20). By helping individuals recognize and challenge irrational beliefs about their abilities and achievements, CBT empowers them to develop more balanced and realistic perceptions of themselves (21).

2. Objectives

The current investigation aimed to assess the efficacy of CBT in enhancing mental health, self-esteem, and emotional regulation among medical students grappling with IS.

3. Methods

3.1. Study Design

Regarding its aim, this study employed a practical approach using a quasi-experimental methodology that included both pre-test and post-test assessments along with a control group.

3.2. Study Population and Sampling

The research targeted medical students from Tarbiat Modares University in 2023. After administering the Imposter Syndrome Scale (ISS), students who met the inclusion criteria were selected as the final sample. A total of 36 students were randomly assigned (via lottery) to either the experimental group (n = 18) or the control group (n = 18). Sample size determination was based on findings from G*Power software and considerations related to the necessary sample size for covariance analysis. Inclusion criteria required a score higher than 60 on the ISS, absence of acute psychological issues (as confirmed by medical records), no current psychological interventions, and residence in Tehran. Additionally, retention criteria included attending no fewer than two meetings and maintaining a willingness to continue participating in the research. The scores from both the pre-test and post-test stages were entered

into SPSS24 software, and the collected data were analyzed and evaluated using single and multivariate covariance analysis.

3.3. Tools

3.3.1. Imposter Syndrome Scale

The scale was originally developed by Clance and Imes (22). It consists of 20 items, with participants asked to rate their agreement with each statement using a five-point Likert scale, ranging from "never" to "very much." Scores on this scale are interpreted as follows: Less than 40 indicates weak imposter feelings, 41 to 60 suggests moderate imposter feelings, 61 to 80 indicates pathological imposter feelings, and 80 or above indicates severe imposter feelings. High internal consistency has been reported for this scale in previous studies, with Cronbach's alpha coefficients ranging from 0.85 to 0.94 (22). In Iran, a Cronbach's alpha coefficient of 0.86 was reported (4). In this study, validity and reliability coefficients of 0.82 and 0.85 were obtained, respectively.

3.3.2. Mental Health Continuum-Short Form (MHC-SF)

This questionnaire, adapted from the long form of the mental health continuum, consists of 14 items assessing emotional well-being, mental health, and social health. Participants rate their mental health using a six-point Likert scale, ranging from "never" (1) to "every day" (6). Scores range from 14 to 84, with scores of 14 to 28 indicating low mental health, 28 to 56 indicating average mental health, and above 56 indicating high mental health (23). Keyes's study (23) demonstrated a validity of 0.80 and an internal consistency Cronbach's alpha coefficient of 0.73. In Iran, the short form of the mental health questionnaire showed a Cronbach's alpha coefficient of 0.87 (24). In this study, validity and reliability coefficients of 0.91 and 0.84 were obtained, respectively.

3.3.3. Eysenck Self-esteem Scale (ESES)

The self-esteem scale is a 20-question tool developed by Eysenck (25). Each item has three options: Yes (1), no (0), or don't know (0.5). The maximum and minimum scores on this questionnaire are 30 and 0, respectively. A score of 15 or higher indicates high self-esteem, emotional stability, and adaptability, while scores lower than 15 suggest feelings of depression and emotional instability. In Iran, Vasli et al. (26) reported the validity of this scale to be 0.84 for female students and 0.82 for male students. In this study, validity and reliability coefficients of 0.86 and 0.81 were obtained, respectively.

3.3.4. Emotion Regulation Questionnaire (ERQ)

The emotion regulation questionnaire, developed by Gross and John in 2003, includes two subscales: Cognitive reappraisal (6 items) and expressive suppression (4 items). Participants rate their responses on a 7-point Likert scale, ranging from 1 to 7. Gross and John (27) reported internal consistency correlations of 0.79 for the cognitive reappraisal subscale and 0.73 for the expressive suppression subscale. Additionally, the overall internal validity of the scale was reported as 0.73, with a retest reliability of 0.69, indicating acceptable reliability (27). In Iran, the Cronbach's alpha coefficient for this scale was reported as 0.79, and the correlation coefficients of each item's score with the total score ranged from 0.51 to 0.68 (28). In this study, validity and reliability coefficients of 0.87 and 0.83 were obtained, respectively.

3.4. Intervention

After selecting the sample for both the experimental and control groups, research questionnaires were completed by members of both groups during the pre-test phase. The experimental group then participated in eight 90-minute weekly CBT sessions, administered according to the program proposed by Egan and Shafran (29). The control group did not receive any intervention. The CBT program was designed considering key characteristics outlined in the CBT design (Table 1) (29). The control group was instructed to continue their usual academic activities and received general support and encouragement to participate in assessments at designated intervals, but they did not receive any active psychological intervention during the study period.

4. Results

The mean age of the experimental group was 22.84 ± 6.47 years, while the mean age of the control group was 25.02 ± 5.93 years. Among the students, 57% were at the master's level, 65% were female, 71% were single, and 42% were studying in engineering fields. Table 2 presents the mean and standard deviation of the pre-test and post-test scores for mental health, self-esteem, cognitive reappraisal, and expressive suppression among students with IS in both the experimental and control groups.

Table 1. Summary of Cognitive Behavioral Therapy Sessions for Imposter Syndrome of Medical Students

Session	Content	Topic
1	Conceptualization of IS, analysis of benefits; disadvantages	The purpose of this meeting is to explain the nature of IS and the causes of its continuation and to express the positive and negative aspects IS is associated with brainstorming about its implications.
2	Self-reliance, reality versus fantasy	The content of this section is the areas of IS and how it occurs in life. Also, the benefits of self-reliance are emphasized and myths related to IS are discussed in the group.
3	Contextualization and behavioral testing	In this meeting, the purpose of the research is determined and the thoughts recorded in the homework sheets of the previous week are used. Behavioral tests are also introduced.
4	All-or-nothing thinking	In this section, after introducing the "all or nothing" thinking, a behavioral experiment can be designed for it. The next goal is to help clients develop more flexible thinking and emphasize the importance of changing inflexible rules.
5	Extended attention, cognitive distortions, registration; daily thoughts	With cognitive distortions, filtering out negative events and other cognitive distortions is challenged, and clients are helped to challenge unhelpful thoughts and learn to formulate more logical thoughts.
6	Procrastination, problem-solving, time and schedule management; small for enjoyable activities	This section focuses on procrastination and teaches clients ways to deal with it. Also, time management, planning for enjoyable activities, and the importance of creating a balance between; Time for rest is emphasized with progress.
7	Values, reducing self-blame	The purpose is to introduce self-blame and its destructive effects and emphasize efforts to reduce the frequency and intensity of self-blaming thoughts and increase self-compassion by identifying compassionate voices and practicing how to respond to hearing self-blame.
8	Development of self-assessment, goals, relapse prevention	In this session, the connection between judging oneself as a person and his successes are tried to be weakened and his self-esteem is established based on other factors. Also setting flexible goals and Realism is encouraged and emphasis is placed on giving equal attention to what the client can improve.

Using multivariate analysis of covariance (MANCOVA), the study evaluated the effectiveness of CBT on mental health, self-esteem, cognitive reappraisal, and expressive suppression in students with IS. Rigorous assessments of assumptions, including equality of variance, covariance matrix, and regression coefficients, confirmed their validity. Consequently, a MANCOVA was conducted to compare differences between the experimental and control groups, as detailed in Table 3.

The findings from Table 3 reveal the influence of the independent variable on the dependent variables. Specifically, there is a significant difference between the experimental and control groups in at least one of the variables, including mental health, self-esteem, cognitive reappraisal, and expressive suppression. Additionally, based on the calculated effect size, approximately 75% of the total observed variance between the experimental and control groups can be attributed to the influence of the independent variable.

Upon examining the data presented in Table 4, it is evident that the F-statistic yields significant results for mental health ($F = 37.73$), self-esteem ($F = 54.76$), cognitive reappraisal ($F = 35.65$), and expressive suppression ($F = 78.04$) at the 0.001 level. These outcomes indicate a substantial difference between the groups concerning these variables. Moreover, the effect size calculations reveal that 56% of the variance in mental health, 64% of the variance in self-esteem, 55% of the variance in cognitive reappraisal, and 72% of the variance in expressive suppression are attributable to the effect of the independent variable. Consequently, it can be concluded that CBT significantly reduces expressive suppression and enhances mental health, self-esteem, and cognitive reappraisal in students with IS.

5. Discussion

The present study aimed to evaluate the effectiveness of CBT in improving mental health, self-esteem, and emotional regulation among medical students experiencing IS. The findings offer strong support for the positive impact of CBT on the mental health of students with IS, aligning with research by Clark et al. (5), Thomas and Bigatti (6) and Wang et al. (7). The study provides compelling evidence for CBT's effectiveness in improving mental health among students grappling with IS (20). The observed improvements in mental health outcomes following CBT underscore the importance of addressing the cognitive and emotional factors contributing to IS (19). By equipping students with cognitive restructuring techniques and coping strategies, CBT offers a valuable resource for promoting psychological well-being and resilience (7).

Consistent with prior studies, this research reinforces the notion that CBT can effectively alleviate symptoms of anxiety, depression, and other psychological distress commonly associated with IS. These findings highlight CBT's potential as a versatile and accessible intervention for addressing mental health concerns among individuals experiencing IS.

Clark et al. investigated IS among mental health professionals and its relationship with compassion fatigue and compassion satisfaction (5). With 158 participants, the study found a positive correlation

Table 2. The Mean and Standard Deviation of Scores for Mental Health, Self-esteem, and Emotion Regulation

Variables and Groups	Mean ± SD	S-W	P-Value
Imposter Syndrome			
Pre-test			
Experimental	63.58 ± 6.25	0.156	0.057
Control	64.22 ± 5.92	0.162	0.069
Post-test			
Experimental	57.41 ± 6.05	0.135	0.084
Control	63.79 ± 6.48	0.119	0.058
Mental Health			
Pre-test			
Experimental	46.88 ± 5.24	0.156	0.067
Control	46.94 ± 5.11	0.196	0.057
Post-test			
Experimental	49.72 ± 4.59	0.102	0.061
Control	46.77 ± 5.21	0.143	0.094
Self-esteem			
Pre-test			
Experimental	14.66 ± 5.02	0.115	0.067
Control	14.77 ± 1.53	0.119	0.091
Post-test			
Experimental	17.83 ± 1.39	0.103	0.084
Control	14.61 ± 1.59	0.114	0.081
Cognitive Reappraisal			
Pre-test			
Experimental	28.50 ± 1.42	0.136	0.099
Control	28.55 ± 1.32	0.102	0.087
Post-test			
Experimental	31.34 ± 1.24	0.184	0.074
Control	28.39 ± 1.09	0.131	0.080
Expressive Suppression			
Pre-test			
Experimental	18.77 ± 1.47	0.124	0.079
Control	18.66 ± 1.28	0.108	0.095
Post-test			
Experimental	15.56 ± 1.69	0.162	0.086
Control	18.89 ± 1.75	0.146	0.079

Table 3. The Outcome of MANCOVA on Participants' Scores

Test	Value	F	df	Error df	P-Value	Effect Value
Pillai's trace	0.757	21.06	4	24	0.001	0.75
Wilks lambda	0.243	21.06	4	24	0.001	0.75
Hotelling trace	3.121	21.06	4	24	0.001	0.75
Roy's largest root	3.121	21.06	4	24	0.001	0.75

between IS and compassion fatigue, even after adjusting for years of work and age. A negative correlation with compassion satisfaction persisted, and higher levels of IS were predicted by a combination of lower compassion satisfaction and higher burnout. The study emphasizes the need to address IS in mental health settings and suggests implementing preventive measures.

Table 4. Results of ANCOVA on Participants' Scores

Variables	SS	SS Error	DF	MS	MS Error	F	P-Value	Effect Value
Mental health	80.02	63.62	1	80.02	2.12	37.73	0.001	0.56
Self-esteem	99.09	54.28	1	99.09	1.81	54.76	0.001	0.64
Cognitive reappraisal	81.76	66.91	1	81.76	2.23	36.65	0.001	0.55
Expressive suppression	105.40	40.51	1	105.40	1.35	78.04	0.001	0.72

Thomas and Bigatti conducted a narrative literature review summarizing findings from sixteen articles on perfectionism and IS among medical students. The prevalence of IS ranged from 22.5% to 46.6%, with a higher proportion of females experiencing clinical levels compared to males (6).

The results provide convincing evidence for CBT's beneficial influence on self-esteem among students with IS. These findings are consistent with research by Nanda (9), Medline et al. (11), and Pákozdy et al. (12). The observed increase in self-esteem following CBT suggests that addressing cognitive distortions and negative self-beliefs can lead to tangible improvements in students' self-perception (21). By equipping students with cognitive restructuring techniques and self-affirming strategies, CBT promotes a more positive and empowered sense of self (17).

Consistent with prior studies, this research reinforces that CBT can effectively enhance self-esteem and self-worth among individuals with IS. These findings underscore CBT's potential as a versatile and accessible intervention for addressing self-esteem issues and fostering psychological well-being. Medline et al. (11) conducted an anonymous survey to evaluate self-efficacy, IS, assertiveness, perfectionism, and self-rated likability among surgeons. Their findings revealed that self-identified males displayed lower levels of IS and perfectionism but higher levels of assertiveness. Additionally, IS was less prevalent among older age groups. Pákozdy et al. investigated the relationship between IS and self-efficacy, maladaptive perfectionism, and happiness in university students, considering gender differences. Their results demonstrated negative correlations between IS scores and self-efficacy and happiness, along with positive correlations with maladaptive perfectionism across both genders. Females exhibited higher levels of IS and maladaptive perfectionism, with the gender disparity in IS persisting even after accounting for perfectionism (12).

The results of this study showed an increase in cognitive reappraisal and a decrease in expressive suppression among students with IS after undergoing CBT intervention. These outcomes are consistent with the findings of LaPalme et al. (13), Yang et al. (15), and Alrayyes et al. (16). The study demonstrates the effectiveness of CBT in facilitating positive changes in emotion regulation strategies among students grappling with IS (14). The observed increase in cognitive reappraisal and decrease in expressive suppression following CBT suggest that addressing cognitive distortions and negative thought patterns can lead to more adaptive ways of managing emotions (20). By equipping students with cognitive restructuring techniques and emotion regulation skills, CBT offers a valuable resource for promoting psychological resilience and well-being (18).

By encouraging individuals to reframe their thoughts and express emotions more healthily, CBT can empower them to navigate challenging situations with greater emotional flexibility and resilience. These findings highlight CBT's potential as a versatile and effective intervention for addressing emotion regulation deficits associated with IS. Yang et al. (15) explored the impact of achievement goals and IS on psychological distress among female STEM college students. Their study, involving 395 participants, discovered that elevated IS levels mediated the relationship between performance-avoidance and mastery-avoidance goals and psychological distress. Conversely, prioritizing mastery-approach goals correlated with reduced IS levels and mitigated psychological distress. In contrast, Alrayyes et al. conducted a cross-sectional analytical study among adults in Northern Saudi Arabia using non-probability convenience sampling. Of the 384 participants, 57.8% reported experiencing IS. Moderate to severe symptoms of depression were prevalent in 56.5%, stress symptoms in 54.7%, and anxiety symptoms in 32.8%. Burnout was also observed across three domains: Depersonalization (57.6%), emotional exhaustion (64.1%), and diminished personal accomplishment (32.8%) (16).

The research outcomes are specific to medical students enrolled at Tarbiat Modares University in 2023, limiting the applicability of the findings to broader student populations or different time frames. A larger participant pool could enhance the robustness of the

results. Additionally, the study focused primarily on immediate post-intervention effects, overlooking the long-term sustainability of improvements in mental health, self-esteem, and emotional regulation.

5.1. Conclusions

This study reaffirms the potential of CBT as an effective intervention for medical students struggling with IS. Its ability to significantly reduce expressive suppression and enhance mental health, self-esteem, and cognitive reappraisal makes CBT a versatile and accessible tool for improving the psychological health of individuals in high-stress academic environments. Implementing CBT in medical education programs can offer crucial support to students, helping them navigate the demands of their training and fostering a healthier, more resilient future medical workforce.

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Footnotes

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Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after its publication.

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