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Assessing the Efficacy of Cognitive-Behavioral Therapy to Reduce Global Prevalence of Imposter Syndrome Among Family Physicians

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ABSTRACT

Imposter Syndrome (IS) is the condition in which an individual feels as though they are fraud due to feelings of anxiety and an absence of experiencing success internally, despite performing highly in external surroundings. For decades, many family physicians have experienced burnout, a term that refers to a state of mental, physical, and emotional exhaustion; this issue has often led to the larger picture of IS. In the past, studies have found that burnout and IS are directly correlated, but have failed to assert a finalized solution to minimize IS among populations. Considering that physicians, among all healthcare professionals, face IS most commonly, the following research question was asked: To what extent can imposter syndrome among family physicians globally be diminished through the use of Cognitive-Behavioral Therapy? Cognitive-Behavioral Therapy (CBT) is routinely utilized to restructure one's cognitive sense and behaviors, effectively treating a range of mental and emotional issues, such as depression and anxiety. Numerous interventions of CBT were analyzed by looking at the mode of therapy, complete duration, number of sessions, minutes per session, and provider for each intervention. Studies were then extracted based on their level of homogeneity, which was assessed through a chi-square test for homogeneity, and were followed up with a two-sample z-test on a 95% confidence level. A chi-square test for homogeneity was needed to determine if the results of the two interventions were sufficiently similar to combine into an overall result. The resulting combined confidence interval achieved an interval with plausible values of [-5.48, -1.61]. The first study had an individual interval of [-10.03, 1.57] while the second study had an individual interval of [-5.52, 1.40]. It was concluded that CBT could be one of the most precise and effective ways to combat the negative impacts of IS, due to a combined confidence interval that did not capture the numerical value of 0 within its confidence interval, indicating a change in
the intervention and control groups, in favor of the intervention group. These findings suggest that CBT can be implemented for use among family physicians globally to ultimately improve the vast amount of shortages of physicians worldwide to move towards a brighter future for the healthcare industry.

INTRODUCTION

Hypothetical Case

Alexandra is a 54-year-old practicing family physician. She is thinking about early retirement because although she finds purpose and passion in her work, she finds it hard to believe she belongs in her workplace among all her talented, dedicated colleagues. Alexandra starts to doubt her abilities and feels that her medical knowledge is insufficient to perform well in her job. Additionally, Alexandra starts to behave unlike herself; she easily becomes irritable and finds it hopeless to help her patients. Outside of her professional life, Alexandra has begun to wane away from any exercise or self-care. Alexandra has forebodings about attending work, and while a few of her colleagues have noticed her shift in attitude, many are ignorant of the issue and feel that Alexandra is going through a phase in her personal life and will eventually surpass this feeling of incompetence. Of note, this is a hypothetical situation.

Background

Imposter syndrome*, also known as the imposter phenomenon, is a behavioral health phenomenon described as self-doubt of intellect, skills, or accomplishments among high high-achieving individuals.[1] This universal issue affects about 70% of individuals during at least one point in their lifetime, if not more.[2] Furthermore, imposter syndrome affects 56% to 82% of graduate students, college students, nurses, medical students, and other professionals; this often goes ignored due to a lack of awareness or denial in one-self.[3]

Similar to imposter syndrome, but less severe in symptoms, burnout is a long-term stress reaction marked by emotional exhaustion, depersonalization, and a lack of personal accomplishment.[4] Burnout is significantly correlated to the development of imposter syndrome in physicians. The presence of burnout in physicians specifically can be attributed to many factors in their lives including work culture, personal and professional lifestyle, and biological factors, such as age, gender, and ethnicity.

Burnout was first acknowledged in the field of healthcare in 1974 by clinical psychologist Herbert Freudenberger.[5] Freudenberger volunteered at a free clinic in New York City at the time where he noticed "emotional depletion" and "psychosomatic symptoms" in many of the volunteer staff at the clinic; he called this behavioral phenomenon "burnout."[5] Four years later, in 1978, imposter syndrome was first recognized by researchers Pauline Rose Clance and Suzanne Ament Imew.[5] They observed 150 women who had PhDs and concluded that although these women received praise for their work, they were discouraged by their internal thoughts. These women participants believed that all of their success was purely due to luck and that they were essentially displaying fraudulent behavior to delude their colleagues of their capabilities.

As rates of imposter syndrome began to spike among physicians as they are "more likely to experience [IS]" than other healthcare professionals, the pervasive phenomenon quickly became very alarming.[6] A 2022 cross-sectional study from the Egyptian Journal of Hospital Medicine included that 23.4% of doctors planned to quit their jobs,[7] something that cannot be afforded by the immense shortage of doctors in today's healthcare field. Further research has found that imposter syndrome can affect individuals of all backgrounds and genders,[3] which has sparked the purpose of this research study: to examine the extent to which burnout that leads to imposter syndrome in family physicians can be reduced through the utilization of Cognitive-Behavioral Therapy (CBT). In the past, CBT has been used to help individuals with obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD), depression, and anxiety.[8] With the use of CBT, physicians can be provided with the mental support that they need to reach their ultimate potential and are less likely to resign from their profession or face suicidal ideations.

Elucidation of Cognitive Behavioral Therapy (CBT)

CBT is a form of psychological treatment that combines cognitive and behavioral therapy; it consists of patients working with mental health counselors, such as a psychotherapist, and attending a limited number of sessions.[8] CBT is widely used for a range of mental and emotional health issues. It works to help patients with challenging harmful thoughts, which would be greatly effective for imposter syndrome to improve a physician's quality of life.

Gap in Research

While there has been much research regarding imposter syndrome and the uses of CBT separately, pre-existing research has not come to solidified conclusions about what sort of treatments should be utilized to cope with imposter syndrome. This is because imposter syndrome is not a mental disorder that one can be medically diagnosed with, as it is not listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM).[9] The finding of this solution is of great importance to society because physicians must be able to help their communities without facing the obstacle of fraudulent feelings. If such mental obstacles continue to rise among physicians, many healthcare systems will be-

come corrupt and the number of physicians globally will decrease; this cannot be afforded as there is already a shortage of about 4.3 million physicians globally as of 2023, and an estimated shortage of 10 million healthcare workers by 2030.[10]

To lessen the burden of IS, which impacts physicians and the residents of their respective communities, and to promote the spread of correct public health information, Cognitive-Behavioral Therapy will be tested for its effectiveness in reducing impostorism among the global physician population. Therefore, this study can assist with finding more effective strategies to deter the toll that imposter syndrome takes on a physician's morale and aims to merge the findings of what contributes to imposter syndrome among physicians, a qualitative measure, with the statistical findings of how effective CBT has been in ridding of similar cases where medical professionals faced feelings of doubt, a quantitative measure. By the end of this research study the following guiding research question will sought to be answered: To what extent can imposter syndrome among family physicians globally be diminished through the use of Cognitive-Behavioral Therapy? To answer this question, the developed project goal is to provide a newer perspective on a possible therapeutic method that aids individuals suffering from the symptoms of imposter syndrome: Cognitive-Behavioral Therapy (CBT).

LITERATURE REVIEW

A career in medicine can be demanding. Physicians tend to have what is called an Achilles' heel: they disregard their level of achievement and instead, feel it is never good enough.[11] Therefore, much of their burnout can be attributed to their own behaviors.

Increased Burnout Due to Family Physicians' Tendencies

Researchers have found, after using various study methods, that there is a correlation between high rates of burnout and physicians, which consequently, has emerged feelings of impostorism among physicians. This is ascribed to a physician's depth of commitment, stress tolerance, moral values, and resilience. Additionally, a major part of a physician's risk of imposter syndrome is their personality. Personality has five basic dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism.[12] Physician's personalities have been studied extensively and several studies have found that higher levels of neuroticism among them are associated with a higher likelihood of experiencing burnout.[13] On the contrary, physicians with an internal locus of control, the belief that outcomes in their lives are in their control, as opposed to external forces, have a lower risk of experiencing impostorism.[14]

Evidence of imposter syndrome being highly endemic among physicians was also assessed by surveying. A national survey from Stanford Medicine, also published in the *Mayo Clinic Proceedings*, found that 1 in 4 out of roughly 3,000 physicians aged 29 through 65 reported "frequent or intense impostor syndrome symptoms."[6] This study was also compared to the responses of more than 2,500 individuals with different professions in other fields. The results, which were derived after adjusting confounding factors, such as age, gender, and relationship status, found that physicians have a 30% higher risk of suffering from imposter syndrome in comparison to other professionals in non-medical fields and an 80% higher risk in comparison to individuals with a doctoral or professional degree in other fields.[6]

In conversation with this, a 2021 study from the National Burnout Survey series and co-authored by the American Medical Association (AMA) discovered that 62.8% of physicians in America reported at least one symptom of burnout, a significant spike from the 38.2% of physicians that reported such feelings in 2020.[15] Dr. Sahar Yousef, a cognitive neuroscientist, explains that individuals suffering from burnout are more likely to experience imposter syndrome.[16] Both Stanford Medicine and the National Burnout Survey studies highlight the spike in burnout and IS, which is present primarily due to a lack of support and awareness among physicians as they have little to no information regarding how to take care of their mental health before burnout quickly progresses into IS.

To put matters into more contemporary terms, nearly half (49%) of Generation Z and millennials reported feelings of imposter syndrome,[16] suggesting that the future of healthcare will face many obstacles, putting patient care and self-well-being in jeopardy, if resolutions are not looked for today. Furthermore, 78% of the newest members in the workforce have reported feelings of imposter syndrome.[16] This goes back to show how the current and upcoming generations are at risk of severe professional dissatisfaction. This issue is relevant to today's society because it is escalating into a besiegement for professionals worldwide with physicians being more drastically impacted than other healthcare professionals. Since imposter syndrome can be heavily correlated to burnout, it is pivotal to understand the phenomenal experiences of imposter syndrome, which can be seen in *Figure 1*.

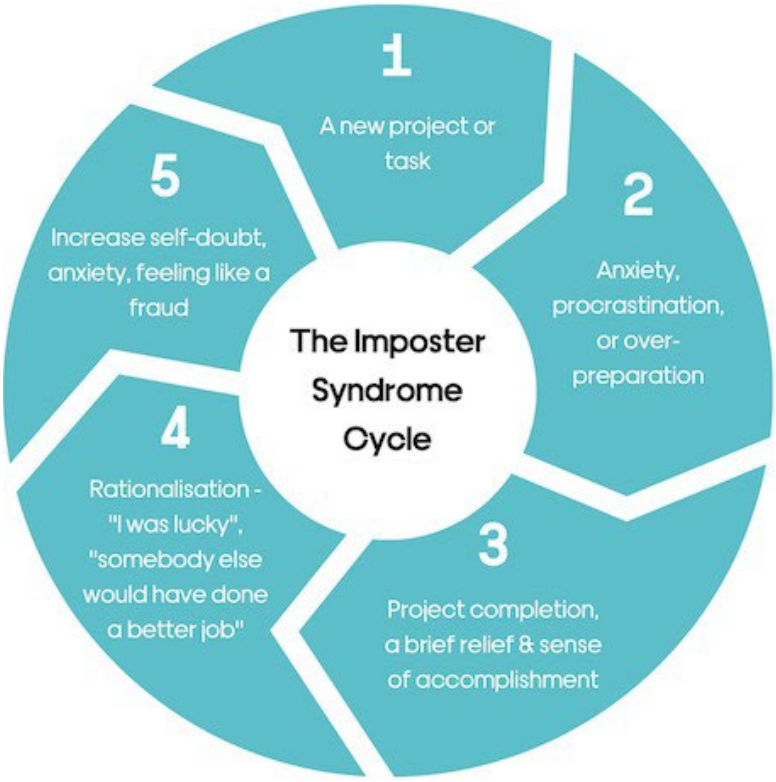


Figure 1: The imposter Syndrome Cycle[17]

CBT, a potential solution, has proven to be effective in a randomized controlled trial, consisting of 248 participants aged 18-75 years with chronic depression. This study measured levels of depression in participants using the Beck-Depression Inventory (BD-II Score) scale. Intervention and control groups were split into 136 and 112 participants, respectively. After this trial, which included 6-month, 12-month, and 46-month follow-up times; these follow-up times and their results are displayed in *Figure 2*. It was found that 43% of intervention participants experienced lower levels of depression, there was a minimum 50% reduction rate in depressive and anxiety symptoms in the intervention group in comparison to the control, and there was lower usage of antidepressants in the intervention group.[18] These findings were significant in that they indicated that CBT has longevity and does not only provide short-term relief, as medication does.

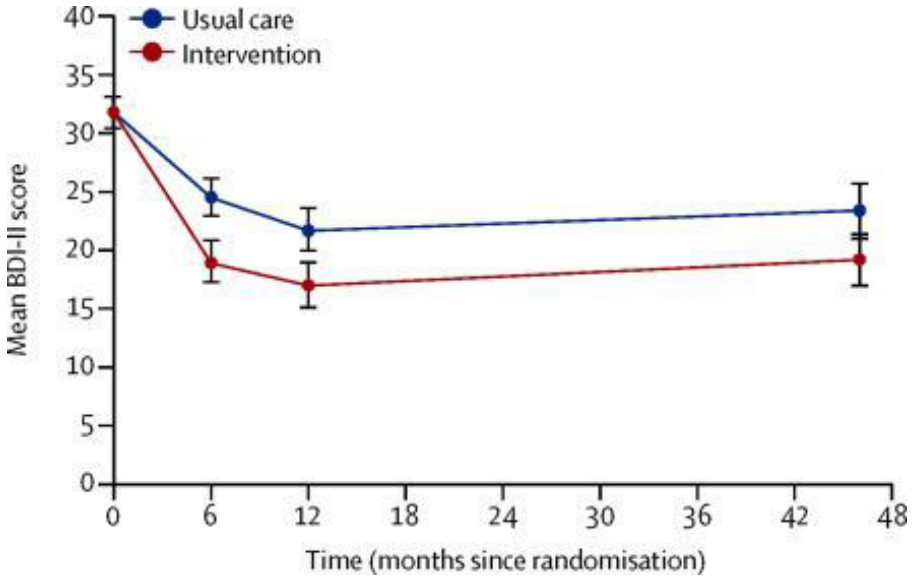


Figure 2: Mean BD-II Scores of Intervention and Usual Care Groups at 6, 12, and 46 months.[18]

Wiles et al.'s findings complement another 2020 intervention-based study comprising 93 participants, all of whom had COVID-19. This study aimed to see if CBT could reduce levels of anxiety among these individuals. After splitting the participants into 47 and 46 in the intervention and control groups, respectively, the researchers conducted a two-sample t-test. Their findings were that there were "significant decreases" in means in terms of the intervention participants' levels of depression, anxiety, and stress compared to the control; anxiety level reductions can be seen in *Figure 3*. It was then concluded that CBT was effective in "improving the psychological health" of patients and it was suggested that CBT should be utilized for patients with further chronic diseases.[19]

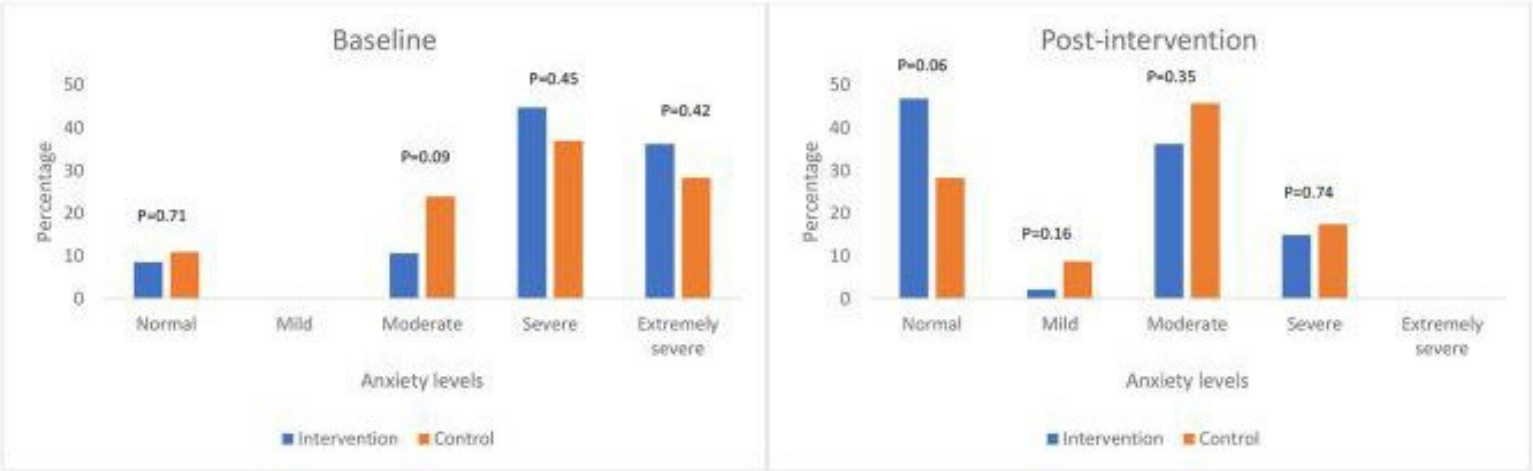


Figure 3: *The Percentage of Each Level of Depression,Anxiety, and Stress Scale-21 (DASS-21) Indicators by Intervention & Control Group at Baseline and Post-Intervention Anxiety Levels.*[19]

From the findings and results of these two intervention-based studies, it was concluded that CBT could likely be impactful in lessening impostorism since IS is associated with both depression and anxiety.[20] Additionally, I was able to familiarize myself with how interventions could be included within my study and the aligned methodology that would be most appropriate for my research discipline.

RESEARCH DESIGN AND METHODOLOGY

Study Design

This study delves into the prevalence of imposter syndrome among family physicians globally during the 21st century. It looks into how factors such as work culture, personal and professional lifestyle, and biological factors play a role in a physician's risk of imposter syndrome; many of these factors contribute to burnout, which has a significant positive correlation to the imposter syndrome. This is significant because imposter syndrome can greatly affect medical professionals' mental health; notable positive correlations between suicidal ideation and imposter syndrome have been observed.

A meta-analysis was conducted for this research study. This approach was most beneficial for this area of research because it allowed for a better understanding of behavioral interventions in the studies gathered. Other methods, such as a randomized controlled trial could not capture the same details. They would prohibit data results from being generalized much further, which was required for this study as it addresses a global population of physicians.

Additionally, confirmation bias can be avoided this way. Through this method, heterogeneity could be, and was, observed in terms of origins of populations, gender, race, level of experience, follow-up times, and scales. Additionally, article factors such as year of publication, response rate, and average imposter syndrome prevalence as stated by authors were acknowledged.

To aggregate and extract data, the specific details that were looked for were: percentage statistics on how often physicians reported feeling symptoms of imposter syndrome or burnout, median years of experience, biological characteristics of a population, including the origin country of the population, and percentages of males and females in the samples tested, study design, and the sample size (n).

Pre-existing research fails to recognize the effectiveness of the more specific therapeutic approach, CBT. Instead, it proposes psychoanalytic therapy, a more general approach because there is inadequate research to come to a solidified conclusion. Various therapies were also looked into before reaching CBT, such as Solution-Focused Brief Therapy (SFBT), psychodynamic therapy, and psychoanalytic therapy. However, these therapies fell short because they did not include a physician's social life aspects, and instead delved into their unconscious and internal thinking only.

For further elucidation of the thought process and information that is being looked for with the methodology for this study, please refer to *Figure 4* which offers information regarding the three chief aspects that are being sought out while observing studies and whether these characteristics provide qualitative or quantitative information that aids in proposing implications.

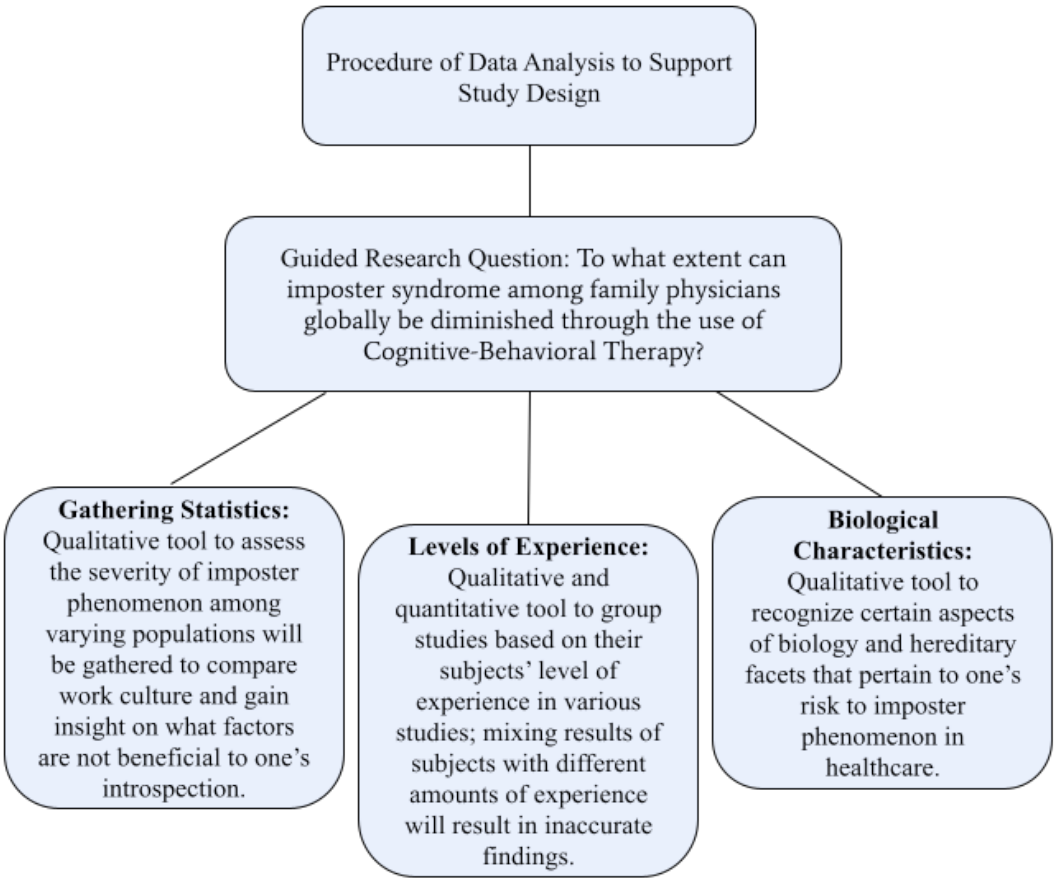


Figure 4: *In-Depth View of Data Gathering: Looking into Specific Aspects of a Family Physician's Conduct*

Search Strategy

To move forward, I had to select the studies to be included in this meta-analysis. To do so, I created a search strategy by generating a list of comprehensive key terms that would be inputted into advanced searches in various scholarly databases. Terms and phrases relating to the imposter syndrome in family physicians were utilized in these searches (e.g. "family physicians," "imposter syndrome," "suicide," "burnout") and self-report measures (e.g., "questionnaire," "surveys," "self-assessment") were inputted to acknowledge which types of studies allowed for family physicians to share more detail. By doing so, this research study maintained accuracy and quality which is useful in creating strict guidelines for family physicians to express their levels of imposter feelings with intention.

Delimitations

Studies were included if they were dated from 2016 or after, had a full text provided, were peer-reviewed by experts, and had acknowledged that the author(s) have no conflicts of interest. Study variables (e.g., study methodology, treatments provided), participant variables (e.g., demographics, professional setting), and pre-defined quality variables (e.g., human subjects approval, response rates reported) were all observed as well. Studies that were essays, reported cases of legal fraud, or any mention of Munchausen's of oneself or by surrogate were excluded from use. Of these 50 studies, 18 studies met the inclusion criteria of this meta-analysis. These studies were tested for publication bias, followed up for up-to-date information, and assessed for their study quality by being reviewed by professionals. Additionally, bias was avoided by excluding two or more sources that presented the same data.

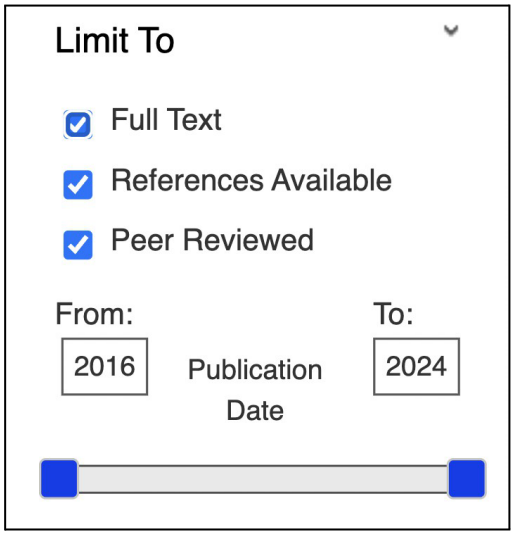


Figure 5: *"EBSCOHost Filters"* *EBSCOHost*, www.ebsco.com. Author's screenshot.

Research Validation and Instruments

This meta-analysis was approved by the Campus Institutional Review Board (IRB) after a research proposal had been submitted. This proposal included the methodology, original hypotheses, and possible further implications in this research study. It was also stated in the proposal that this research would be of interest to medical scientists looking to enhance the performance of professionals in the medical field by addressing one of the largest difficulties in being a physician: feelings of self-doubt. Furthermore, the Campus IRB approved Google Sheets and Google Drawings as organizational aids and research instruments for this study. The research proposal explained that data tables and charts would display the significance of the issue and comparisons among behavioral interventions. This research study received approval in November 2023.

Subjects

The subjects in this study were individuals who participated in the studies and are being observed in this meta-analysis. These individuals consisted of practicing family physicians, based globally, when assessing the levels of burnout and IS. Individuals suffering from depression, anxiety, and PTSD were also observed. A demographic of individuals from various countries allows for comparison among various work cultures, and different levels of experience. Thus, such systematic analysis brings to light whether the issue of IS is prevalent worldwide or if it is concentrated more in a select few countries.

Data Measurement

Statistical analyses of these 18 studies were conducted by creating tables and a forest plot to compare data and make conclusions regarding the effectiveness of CBT in terms of imposter syndrome among family physicians globally in the 21st century. Firstly, a chi-square test of homogeneity was performed between two interventions. This test was

performed to verify the similarity between their effect sizes (e.g. mean differences, odds ratio, risk ratios). Secondly, a two-sample z-test was the best fit to visualize results on a forest plot because of large sample sizes that follow a normal sampling distribution, known population variance, and binary outcomes, all of which make this testing strategy appropriate for demonstrating the benefits of CBT for IS among physicians.

While it was heavily considered to use bar graphs to display statistics of imposter syndrome, this idea was ineffective because it would oversimplify the results by not capturing the nuances and variability that are present in various interventions, ultimately giving a limited view, leading to inaccurate results and an inimitable study. In contrast, a forest plot makes it feasible to see variations between individual study results. The secretion of this data analysis is with the help of Google Drawings and Google Sheets; these sources allow for simple organization and input of numerical values that I had calculated and observed.

RESULTS

Table 1: *Assessment of the Rates of Burnout Among Healthcare Facilities Globally (N = 6)*

Author(s), Year	Origin of Population	Study Design	n =	Number of Studies	Percentage of Burnout Responded	% Male	% Female	Years in Service (Median)
Ayaslier et al., 2022[21]	Turkey	Cross-Sectional Study	258	38	59.2%	56.4% (154)	43.6% (112)	10.5
Koressel et al., 2020[22]	United States (IL)	Cross-Sectional Study	33	38	65%	15% (5)	83% (27)	3
Cheung et al., 2023[23]	United States (IL)	Survey	475	26	51.4%	N/A	N/A	N/A
Alanazi et al., 2022[24]	Saudi Arabia	Cross-Sectional Study	303	32	65%	51.5% (156)	48.5% (147)	5
Japec et al., 2017[25]	Croatia	Cross-Sectional Study	2,557	33	58%	32% (820)	68% (1,737)	15
Creager et al., 2019[26]	United States	Cross-Sectional Study	1,437	37	61%	54.3% (781)	45.7% (656)	N/A

Table 2: *Assessment of the Rates of Imposter Syndrome (IS) Among Healthcare Facilities Globally (N=5)*

	Origin of Population	Study Design	n =	Number of Studies	Percentage of IS Responded	% Male	% Female	Years in Service (Median)
Penick et al., 2023[27]	United States (NC)	Survey	94	17	41%	60.2% (56)	37.6% (35)	8.8
Paladugu et al., 2021[28]	United States (PA)	Survey	71	29	34%	59.2% (42)	35.8% (29)	5
Leach et al, 2018[29]	United States (MN)	Survey	88	29	58.2%	70.2% (62)	29.8% (26)	N/A
D'Souza et al., 2018[30]	India	Cross-Sectional Study	150	27	86%	38% (57)	62% (93)	N/A
Shanafelt et al., 2022[6]	United States	Survey	3,116	63	58.2%	61.9% (1,934)	38.1% (1,185)	12

Various clinical studies were assessed. As seen in *Table 1*, the minimum percentage of burnout reported by many populations of physicians globally (51.4%) exceeds 50%. Therefore, it is evident that across multiple work environments in various countries, there is serious internal dissatisfaction among the physicians working at these healthcare facilities resulting in substantial burnout rates.

These significant burnout rates are important to society since they lead to resignations and shortages of healthcare workers. Additionally, these rates of burnout are significantly correlated to an even larger issue: Imposter Syndrome. As displayed in *Table 2*, there are notable rates of IS among many populations as well. These percentages show how crucial it is to find an effective solution. This effective solution could be the implementation of Cognitive-Behavioral Therapy (CBT).

To further delve into the idea of utilizing CBT to reduce rates of IS among physicians globally, *Table 3* outlines the essential characteristics of the research studies regarding CBT being used to help individuals with stress-related disorders in this meta-analysis. 7 studies, comprising 760 individuals, met the inclusion criteria. Sample sizes ranged from 44 to 230, with a median of 88 participants. The participants' mean age varied from 48.63 to 55.0, with a median age of 53.83 years.

Table 3 provides insight into interventions in which CBT was used to address profound stress-related disorders, including insomnia, menopause, depression, and anxiety. These studies were conducted across five different countries: the United States of America (*n=3*), Spain (*n=1*), United Kingdom (*n=1*), South Korea (*n=1*), and India (*n=1*). Among the seven studies, three employed individual interventions, while the remaining four used group and web-based interventions, respectively. Various measures were used to assess depression in these studies' participants, including the CES-D (Center for Epidemiologic Studies Depression Scale) and HADS (Hospital Anxiety and Depression Scale). To assess levels of anxiety, measures such as the SCL-90-R (Symptom Checklist-90-Revised) and GAD-& (Generalized Anxiety Disorder-7) were used. The average number of sessions for CBT was approximately 10 sessions with an average duration of approximately 50 minutes per session.

Table 3: *Descriptive Summary of Included Studies Regarding the Use of Cognitive-Behavioral Therapy (CBT) (N=7)*

Study (Origin of Population)	Sample Size (*n*)	Age (Mean ± SD)	Intervention 1. Mode of Therapy 2. Duration/No. of Sessions 3. Min/Session 4. Provider	Control	Follow-Up Times	Outcomes (Scale)
Ham et al., 2020[31] (South Korea)	44	Intervention 53.83 ± 6.64 Control 55.45 ± 4.43	1. Group and Individual 2. Weekly sessions over 4 weeks 3. 30 to 60 minutes 4. Psychologist and psychiatrist	Group education	1 month and 12 months	CES-D, PSQI, ISI, and MenQoL
Reddy et al., 2019[32] (India)	80	Intervention 48.63 ± 0.55 Control 49.16 ± 0.8	1. Individual (in person) 2. 6 weekly group CBT sessions 3. 50–60 min 4. Primary provider	TAU	1 month and 6 months	CES-D
Hardy et al., 2018[33] (United Kingdom)	124	54.09 ± 3.4	1. Individual 2. Self-help Cognitive Behavioral Therapy over 4 weeks 3. Unclear 4. Self-help	No treatment waitlist control	6 and 20 weeks post-randomization	PSQI, HFRS, HFNS beliefs and behaviors, MRQ, WHO, and WSAS
McCurry et al., 2016[34] (United States of America)	88	Intervention 55.0 ± 3.5 Control 54.7 ± 4.7	1. Individual (in person) 2. 6 CBTs in 8 weeks 3. 20–30 min 4. CBT experts (coaches)	Menopause education control (phone session)	8 and 24 weeks post-randomization	ISI, PSQI
Govillard et al., 2022[35] (United States of America)	88	50.16 ± 9.13	1. Group CBT 2. 10 sessions 3. 75 minutes 4. Researchers	Biofeedback, Waitlist	6 months	SCL-90-R
Aguilera et al., 2022[36] (Spain)	106	54.5 ± 9.00	1. Hybrid CBT (In-Person/Online) 2. 18 sessions 3. 60 minutes 4. Staff Member of the Universitat de Barcelona	PCT	6 months	HADS

Table 3: *Cont.*

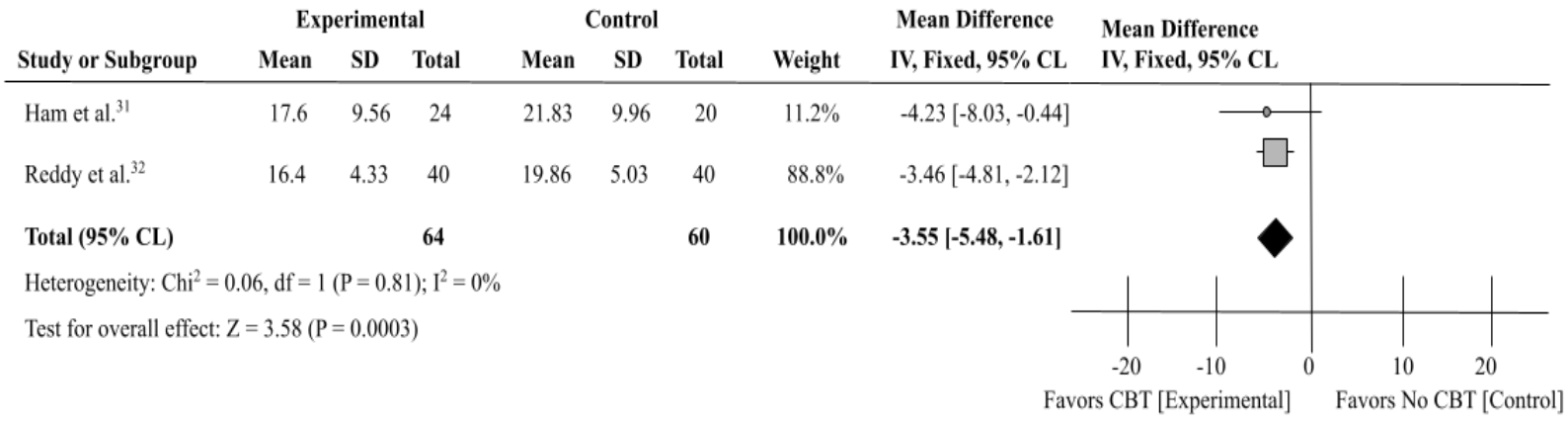
Lumley et al., 2017[37] (United States of America)	230	49.13 ± 12.22	1. Group CBT 2. 8 sessions 3. 90 minutes 4. Therapist	EAET + Education	6 months	CES-D, GAD-7

Abbreviations: CES-D—Center for Epidemiologic Studies Depression Scale; PSQI—Pittsburgh Sleep Quality Index; ISI—Insomnia Severity Index; MenQoL—Menopausal Quality of Life; HFRS—Hot Flush Rating Scale; HFNS—hot flush and night sweat; MRQ—Menopause Representation Questionnaire; WHO—Women's Health Questionnaire;WSAS—Work and Social Adjustment Scale; SCL-90-R—Symptom Checklist-90-Revised; HADS—Hospital Anxiety and Depression Scale; GAD-7—Generalized Anxiety Disorder-7

Efficacy of Cognitive-Behavioral Therapy (CBT) Interventions on Depressive Symptoms

The efficacy of CBT on depressive symptoms can be visualized in *Figure 6*, which features a forest plot that illustrates the corresponding effect sizes of CBT. To create this forest plot, two studies from Ham et al. and Reddy et al., totaling 124 participants, were used from *Table 3* as their data was suitable for pooling. When these two studies were examined separately, they displayed statistically significant improvement in the intervention groups and their levels of depressive symptoms. Therefore, the fixed-effect model was used to combine the mean differences (MD) in the bettering of depressive symptoms between participants undergoing CBT (experimental group) and the participants that did not receive CBT (control group). The combined MD was statistically significant (d = 3.55; 95% CI, −5.48, −1.61; $p < 0.05$), which proved that the effect size was notable; smaller effect sizes would mean limited implications. Additionally, it is noteworthy that at the 1-month follow-up for these two interventions, depressive symptoms were decreased by 15% in 64 participants that utilized CBT, while the 60 participants that were in the control group had their depressive symptoms increase by 16%.

Figure 6: *The Effect of Cognitive-Behavioral Therapy (CBT) on Depressive Symptoms*



The study by Reddy et al. was given a higher weightage because it had a larger sample size than that of Ham et al. and had less variability within itself, contributing more to the overall effect size to show the practical significance of the overall effect size estimate. The I^2 percentage represents the level of heterogeneity between the studies; with a 0% I^2 statistic, these interventions are considered homogenous and appropriate for this meta-analysis. These results are statistically significant because there is a positive *z*-score value of 3.58 and because the p-value of 0.0003 is less than the alpha value of 0.05, meaning that this research study rejects the null hypothesis that there is no variation between the intervention and control groups in terms of the levels of impostorism, and instead fails to reject the alternative hypothesis that CBT is a successful intervention for reducing IS among family physicians.

Regarding the corresponding forest plot, the black diamond represents the combined confidence interval, in the forest plot in *Figure 6* is leaning towards the left side of the plot; the confidence interval represented by the black diamond, -5.48 to -1.61, does not include the number 0, so it is proven that there is a difference between the intervention and control group. This difference inclines towards the side of the forest plot that is supportive of the group of individuals who received CBT, portraying the potency of CBT for IS among family physicians.

DISCUSSION

Due to its structure and evidence-based nature, CBT serves as a well-suited intervention for preventing higher rates of IS. The cognitive aspect of CBT focuses on identifying and modifying thought patterns and behaviors that lead to psychological distress, which is done by challenging irrational beliefs. On the other hand, the behavioral component of CBT addresses the real-life implementation of coping strategies to promote behavioral and psychological changes.

Identifying the Relationship Between Cognitive-Behavioral Therapy and Imposter Syndrome

While CBT has been successful in many other scenarios, it is important to address what it would mean to utilize CBT in the context of using it to reduce imposter syndrome among physicians. In these scenarios, CBT interventions would involve cognitive restructuring and behavioral techniques to replace negative self-beliefs with more accurate and self-affirming thoughts and brain processing. Additionally, many longitudinal studies have supported the idea that CBT allows for positive long-term effects and excels any medications that are used for short-term relief, such as antidepressants. In essence, these changes foster development in one's character for the rest of their life, and these lessons can be passed on to future generations.

Implications: Addressing the Need for Perfectionism

Perfectionism, an unrelenting pursuit of flawless performance and excessively high standards, is successfully combatted by CBT. The intervention of CBT is a tailored approach to every individual's problems and necessities. One key feature of CBT attributed to its ability to overcome the toxicity and need for perfectionism among many physicians is its emphasis on cognitive restructuring techniques to foster a growth mindset. CBT promotes cognitive flexibility; in this way, physicians can reduce their tendencies to think in an "all-or-nothing" manner.

Furthermore, CBT allows individuals to reinvent themselves by apprehending practical skills. Through exposure techniques, CBT can provide the support that physicians need to be able to tolerate situations in which they feel unstable or ones that trigger feelings of inadequacy. In fact, by exposing themselves to uncomfortable situations, physicians can build resilience and learn coping mechanisms, such as stress-management techniques, that will allow them to navigate perfectionist thoughts more thoughtfully and less negatively.

CBT emphasizes the importance of understanding self-compassion. Many perfectionists often criticize themselves with a lack of self-acceptance and harsh thoughts. CBT can counteract this by pushing physicians to cul-

tivate a more understanding attitude and promote the reduction of feelings of shame. Instead, physicians can foster a growth mindset; with guided exercises and mindfulness techniques, they can deny the habit of creating low self-esteem for themselves. The data has shown that imposter syndrome is a growing issue and without any action, it will quickly become an even bigger problem for healthcare professionals and the industry.

With the results of this research, CBT can be implemented in the healthcare industry by creating specialized programs in which physicians' needs are taken care of. These programs can focus on specific stressors and challenges that are commonly faced by physicians, such as burnout, work-related stress, or coping with patient care responsibilities. Healthcare organizations should recognize and address cultural variances by ensuring they are culturally sensitive and inclusive by understanding diverse backgrounds and levels of experience among family physicians.

This study filled the gap within pre-existing research by finding an operative resolution to address impostorism among family physicians through CBT. Although IS is not something that can be medically diagnosed to an individual and therefore does not have an assigned treatment(s), this research study offers a solution that can make meaningful impacts in various societies, changing the morale of physicians in an uplifting manner.

Limitations

While this meta-analysis was conducted with great professionalism and attention to detail, there remain certain limitations that hinder the accuracy of the results. For instance, there are variances in the studies utilized, otherwise known as heterogeneity. As numerous tables were made, studies used had different methodologies, participant characteristics, and outcome measures in the data tables. This could lead to differences in the various studies and offsetting scales to measure the data gathered as there are varying scales utilized to measure burnout, IS, and effectiveness of CBT. This limitation was minimized to a good extent by conducting a chi-square test for homogeneity when extracting two CBT interventions to include a two-sample z-test and corresponding forest plot.

Additionally, publication bias was a limitation of this study. Publication bias is when the outcome of an experiment or intervention determines the decision to publish the study. Often, publication bias occurs when study outcomes prove the null hypothesis, which means there is no difference between groups or between study variables. As a result, this limitation diminishes the credibility of the hypothesis testing since the interventions utilized for data analysis could be a result of publication bias.

The final limitation of this study is that when conducting a two-sample z-test, one of the interventions used by Ham et al. resulted in a confidence interval that included 0; the confidence interval was -10.03 to 1.57. This limitation could have been avoided had the two-sample z-test been conducted on an 80% confidence level rather than a 95% confidence. This was a large difference in confidence levels and not one that I wanted to include in my study since the combined confidence interval proved the efficacy of CBT; the combined confidence interval is what policymakers, clinicians, or any other individuals utilizing this research study's findings would look at specifically.

Future Directions

Future research regarding IS and its relationship to CBT must consider intersectionality and diversity characteristics. These characteristics include race, gender, and socioeconomic status. These considerations will allow future research to conduct effective tailored interventions for participants. Future research should address the financial aspects of CBT. Research should observe how insurance can play a role in physicians paying for CBT sessions and whether healthcare companies can provide CBT for their physician employees. Research can also be conducted to see how feasible CBT would be in a physician's schedule.

If physicians cannot afford CBT or their employing company cannot provide paid CBT sessions, future research can conduct technology-based interventions, such as mobile applications or virtual reality platforms. This will allow scientists to explore the feasibility, accessibility, and acceptability of CBT through different methods for

physicians who do not prefer face-to-face therapeutic methods. Accumulatively, Cognitive-Behavioral Therapy can be implemented successfully to lower the prevalence of Imposter Syndrome among family physicians globally, resulting in fewer physicians quitting or feeling unworthy of their profession.

Lastly, future directions for research include broadening the scope of addressed populations. While this research study accounts for a significant portion of healthcare professionals, CBT can be tested for its effectiveness among various healthcare professionals, such as registered nurses, physician assistants, optometrists, and more. With future research regarding this, the healthcare industry can be improved as a whole, as opposed to only for a particular population within.

As this study addressed the healthcare disparity of worldwide healthcare professionals shortage, future research studies can address other healthcare disparities, create newfound solutions, and fill gaps, ultimately making the healthcare industry better than its current status. By increasing knowledge regarding the obstacles faced by healthcare professionals, further research like this study can result in dynamic progression in numerous communities and the overall well-being of societal health, a goal that can make lasting impacts in improving and saving lives worldwide.

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