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The Impact of a Cognitive-Behavioral Therapy Program to Reduce Insomnia on Depressed People

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Abstract

Insomnia is a main precursor to depression; However, the potential for treatment of insomnia is preventing depression is not sufficiently scrutinised between Jordanian patients. Therefore, in this experiment, an investigation of the impact of a cognitive-behavioural therapy program to reduce insomnia on depressed patients in Jordan. The study adopted an experimental design. 17 patients were purposely chosen to join the experiment. The two experimental groups were subjected to the Beck test for depression and the dependence scale. The treatment consisted of 14 treatment sessions of 45 minutes per session. The data was analysed descriptively and inferentially using SPSS 23.0 software. The findings showed that the therapeutic program used is effective in reducing the degrees of depression among depressed and insomnia patients. MANOVA analyses revealed there are statistically significant differences on the two scales in the scores. The level of significance was (0.000), which is less than (α ≤ 0.05) for the independent variable. The explained variance was calculated: (eta squared x 100%): 0.301 X 100% = 30%, meaning that the treatment explained (30%) of the variance in the dependent variable with respect to depression, while the explained variance was calculated for insomnia: (eta squared x 100%): 0.75 x 100% = 75%, meaning that the treatment explained (75%) of the variation in the dependent variable for insomnia. The study recommends conducting further investigation on group therapy modalities of reducing insomnia before making recommendations.

Keywords: Cognitive-Behavioral Therapy, therapy program, insomnia, depression, mental health.

Introduction

A person with major depressive disorder (MDD) experiences difficulty or impairment in key aspects of life, such as social and vocational functioning, as well as pervasive low mood or loss of pleasure and satisfaction (Psychiatric Association, & American Psychiatric

Association, 2013). With a lifetime frequency of roughly 16%, it is also one of the most often diagnosed psychiatric diseases (Caverzasi, 2012; Kessler et al., 2003). Antidepressant medication (ADM) is frequently prescribed as the first line of treatment for depression; however, issues of drug-resistant depression have become a growing concern (Echizenya et al., 2013). Furthermore, several antidepressants have dubious clinical efficacy when compared to a placebo (Ashworth, et al., 2015). For instance, a study by Fournier et al. discovered that the therapeutic benefit of antidepressant drugs was minimal in patients with only mild or moderate depressive symptoms (Lam, et al., 2016). ADMs also typically take a few weeks to have a therapeutic effect on mood, which can cause further disruption in daily life (personal, social, and professional) and raise the risk of suicide (Bernier et al., 2009). There are currently few non-pharmacological treatments for depression that are clinically acknowledged, particularly those that operate quickly and are effective for patients with a range of symptom severity. The development of treatments could immensely benefit the health of the public (Machado-Vieira et al., 2008). Future approaches to such treatments might include focusing on the circadian and sleep systems since people with depression typically report sleep and circadian disruptions (Germain & Kupfer, 2008), with up to 84–90% of depressed people reporting sleep complaints (Tsuno & Ritchie, 2005). These sleep issues are linked to a higher risk of suicide ideation and worse clinical and therapeutic outcomes (Franzen & Buysse, 2022). To prevent the relapse of depression following successful treatment of the condition, sleep-wake disturbances are frequently addressed in therapy (Tsuno & Ritchie, 2005). After a successful course of treatment, the chance of relapsing into depression is significantly enhanced if complaints of sleep or exhaustion remain the noticed symptoms (Alpert, 2006). It follows that treatments that address both sleep issues and depressed symptoms frequently result in larger and longer-lasting mood improvements than those that only address depression (Fava et al., 2006). However, the majority of depression treatments do not specifically address sleep-related problems (Franzen & Buysse, 2022). SSRI a set of a famous prescription for antidepressants, are known to either cause or exacerbate the symptoms of sleeplessness. In addition to the modification of typical sleep architecture, this is a common adverse effect. This makes the issue of sleep disturbance worse (Germain & Kupfer, 2008), while some have hypothesized that the altered sleep pattern is what makes the antidepressant response more effective (Vogel et al., 1990).

Background of the study

It is generally clear that non-pharmacological sleep-based therapies for depression are required in clinical practice as an addition to or an alternative to ADMs. There are numerous such therapies (also known as "chronotherapeutic"), and there is different experiential proof to enhance their effectiveness. Cognitive behavioural therapy for insomnia is among such treatments (CBT-I). it is an effective treatment for sleep problems linked to depression because it uses multiple components to address sleep problems. It is made up of a variety of components that include sleep restriction; cognitive therapy (for example, discussing dysfunctional ideas and attitudes around sleep); stimulus control (to undertake conditioning among the bedroom environment and wake); relaxation training, and sleep hygiene (Taylor & Pruiksma, 2014). It has been demonstrated to be incredibly effective at easing symptoms in those who experience primary insomnia (Franzen & Buysse, 2022). Given the prevalence of insomnia and other sleep-related symptoms that are linked to depression and the behaviours that frequently make these issues worse, CBT-I is particularly pertinent for people who are depressed. Unfortunately, many people will use unhealthy coping mechanisms (like trying to "catch sleep"), which results in persisting of insomnia past the depressing disorder. This is true even though sleep problems may start to contributing to depression, co-occurring, preceding and acute problem. With the altered homeostatic sleep drive and conditioned arousal With and other therapy goals, CBT-I is intended to address these maladaptive coping mechanisms and behaviors. Insomnia is one under-utilized strategy for preventing depression. Years of studies have shown that depression and insomnia are not only closely related, but that insomnia also affects depression's etiology and prognosis. In fact, insomnia doubles the likelihood of incident depression in comparison to healthy sleepers and frequently precedes depression (Baglioni et al., 2011; Mahowald, 2007). Additionally, while depression symptoms are reduced upon treatment of insomnia (Cheng et al., 2019), the symptoms of insomnia frequently linger after depression treatment (Lustberg & Reynolds III, 2000) and are predictive of a shorter remission and higher recurrence rate (Dew et al., 1997). Additionally, insomnia is a recognized and manageable risk factor for depression. CBT-I is recommended as the best method for treating persistent insomnia based on the high responsiveness of insomnia to this approach (Qaseem et al., 2016). Additionally, numerous studies have demonstrated that CBT-I lessens concurrent depression without ostensibly focusing on symptoms of non-sleep depression (Batterham, Glozier & Christensen 2012). Even though insomnia is probably a good candidate for the prevention of depression, few research has looked at depression as a long-term result of CBT-I. One obstacle has been

accessing to CBT-I, which has been greatly constrained by a number of issues such as a lack of certified clinicians, a provider's distance from the patient, and the need for 6–8 weeks of one-on-one patient interaction (Koffel, Bramoweth & Ulmer, 2018). The digital delivery of CBT-I is one remedy for these restrictions (dCBT-I) as it makes it accessible through a PC or other Internet-connected mobile devices, dCBT-I is totally automated (e.g. phones and tablets). Recent research has confirmed that dCBT-I is beneficial in the short term for treating insomnia and depression (Zachariae et al., 2016; Cheng et al., 2019).

Even in susceptible groups, such as people from racial minorities and low socioeconomic status, dCBT-I (six weekly sessions) has been shown to acutely reduce the intensity of depression by 50%. Owing to its accessibility and adaptability, dCBT-I is ideally suited for the prevention of depression by focusing on insomnia as a potential risk factor. First, considering the correlation between depression and insomnia, dCBT-I may only achieve little prevention merely by expanding accessibility to a therapy that halts the development of more recurrent and persistent depression (Batterham et al., 2017). This assertion is supported by the Study "Goodnight" which was reported as a randomized controlled study of dCBT-I in people with sub-clinical depression and insomnia. According to the findings, the initial anti-depressant effect of dCBT-I lasted for about 18 months after treatment (Batterham et al., 2017). No one has yet managed to replicate this effect. Secondly, dCBT-I can prevent depression by reducing or eliminating insomnia as a premorbid risk factor. Despite evaluating this claim in the GoodNight Study (Christensen et al., 2016), no changes were discovered. This may be because depression incidence was under 2% in both the dCBT-I and control groups during the six months following-up treatment. The rate (i.e., 1-year post-treatment) of long-term and prevalence of medium to high danger cases of depression in a bigger number of people suffering insomnia were investigated in this "randomized controlled trial" (RCT) to further investigate the effect of dCBT-I on the prevention of depression.

Objective of the study

1. Investigate the impact of a cognitive-behavioural therapy program to reduce insomnia on depressed patients in Jordan.

Literature Review

The study by Cheng et al (2019) noted that insomnia is frequently preceded by depression; however, there has been no proof that treating insomnia can also prevent depression. Although digital

cognitive behavioural treatment for insomnia can be used to offer CBT-I, it is yet unknown whether the treatment of insomnia can permanently lessen and prevent depression. This RCT evaluated the effectiveness of digital cognitive behavioural treatment for insomnia in the prevention and treatment of depression in a one-year following-treatment. During the study, people with insomnia diagnosed according to the" Diagnostic and Statistical Manual of Mental Disorders" (DSM) made up the study's participants. Patients were given the option of receiving digital cognitive behavioural treatment for insomnia or an attentional control at random. Following up treatment sample consisted of 300 participants in the online sleep education condition and 358 patients in the digital cognitive behavioural treatment for insomnia condition. Ratios of comparative rate for depression at the one year long following up treatment served as the primary outcome metric. The effects of treatment on insomnia were also investigated as potential indicators of incident depression at one year long following up treatment. According to the study, the intensity of depression in the condition of digital cognitive behavioural treatment for insomnia remained noticeably lower than in the control condition at the 1-year follow-up. Additionally, in the digital cognitive behavioural treatment for insomnia condition comparing to the controlling group, 51% more people reported not having any depression at the 1-year follow-up. The incidence rate of severe and moderate depression at one year long following up was cut in half in those with minimal to no baseline depression compared to the control group.

Insomnia is widespread in teenagers and frequently co-occurs with mental conditions, according to Slund et al. (2020). In this study, adolescents with co-occurring psychiatric conditions and chronic pain received CBT-I, and changes in co-occurring symptoms, sleep and, insomnia were assessed. Respondent (n = 23, 78% female) were enrolled in the non-controlled clinical pilot trial from paediatric and psychiatry pain clinics of adolescent. At the pre-and post-intervention points as well as the following-up treatment, assessments of self-reported pain severity, functional impairment, depression, sleep efficiency, anxiety, total sleep time, sleep onset latency, wake after sleep onset, and insomnia were completed. Significant improvements were observed from in the intervention periods for anxiety ($p = 0.001$; $d = 0.31$), depression ($p < 0.001$; $d = 0.87$), total sleep time ($p = 0.015$; $d = 0.22$), sleep onset latency ($p < 0.001$; $d = 1.04$), sleep efficiency ($p < 0.001$; $d = 1.00$), wake after sleep onset ($p < 0.001$; $d = 0.38$), and insomnia symptoms ($p < .001$; $d = 1.63$). 8 participants only provided data with continued enhancement for all metrics at the follow-up. Hence, the study included that sleep quality and insomnia symptoms might enhance improve after cognitive behavioural treatment for

insomnia is administered in a therapeutic environment, and co-occurring psychiatric symptoms might be lessened. Because of the uncontrolled settings, the results of the study should be considered with caution. Peoples et al. (2019) studied cancer survivors for the indirect and direct effects of cognitive behavioural treatment for insomnia on depression. The study collapsed across the ineffective study drug conditions to create CBT-I (yes/no), reporting on 67 cancer survivors from a 2 x 2 RCT of cognitive behavioural treatment for insomnia and armodafinil for insomnia. To evaluate insomnia and depression before, during, and after the 7-week CBT-I intervention. According to the study, the average level of depression for all participants at baseline was 6.44 (range 0–15; standard error = 0.41). Paired t-tests revealed that the CBT-I group saw a 48% (P .001) improvement in depression from baseline to post-intervention compared to the non-CBT-I group's 15% (P =.016) improvement. Participants who received CBT-I had considerably less depression post-intervention than those who did not (effect size = 0.62; P =.001) based on the analysis of covariance control for baseline). These advantages persisted during the three-month follow-up. Spearman rank correlations revealed a significant relationship among concurrent changes in depression and changes in the severity of insomnia from baseline to post-intervention (r =.73; P .001). According to path analysis, there was a decrease in the intensity of insomnia which served as a mediator for the improvement in depression (P .001). The results offer early evidence that CBT-I lowers depression in cancer survivors by enhancing sleep quality. Furthermore, this decrease in depression persisted three months after CBT-I was concluded. This implies that an effective CBT-I intervention can reduce depression.

The benefits of digital cognitive behavioural treatment for insomnia on ideation of suicide in Veterans with insomnia were studied by Trockel et al. (2015). The study relied on longitudinal data gathered during an unrestricted assessment of cognitive behavioural treatment for insomnia training program with large-scale of participants. The investigation was conducted in residential and outpatient treatment centers. The sample for the study consisted of 455 Veterans seeking treatment for insomnia and enrolling in cognitive behavioral therapy. According to the study, 32% of patients reported having suicidal thoughts, up from 21% at the time of the final evaluation [2(df = 1) = 125; P 0.001]. Each 7-point decrease in the Insomnia rate attained after treatment with CBT-I was related to a 65% (likelihood ratio = 0.35; 95% confidence intervals = 0.24 to 0.52) reduction in the odds of suicidal thoughts after controlling for demographic factors and baseline insomnia severity. Changes in the intensity of insomnia had a substantial impact on changes in the severity of depression. The effect insomnia severity’s variance on changing the thoughts of suicidal

remained significant after adjusting for the change in depression severity and other model factors. This analysis of the CBT-I programs with the broadest reach in the United States discovered a clinically significant decline in suicidal thoughts among Veterans receiving CBT-I. An investigation is needed into the processes by which CBT-I can effectively treat insomnia and lower suicide risk. The present findings may have important implications of public health for avoiding veteran suiciding. Taylor et al. (2007) compared the rates of depression and insomnia before and after 6 sessions of CBT-I using a repeated-measures design to test the notion that in patients with insomnia and depression (N = 10), the treatment of insomnia would significantly decrease depression thoughts. After the treatment, 87.5% of patients with normalized depression levels and 100% of completers (n=8) had normalized sleep patterns. Sleep onset delay (-31 min), total sleep time (+65 min), wake time after sleep onset (-24 min), sleep quality (+19%) and sleep efficiency (+14%), all significantly improved post-treatment. These improvements persisted at the 3-month follow-up. Between pre- and post-treatment, there was a declining trend in depression scores that became statistically significant at the three-month mark. The outcomes of intent-to-treat studies were also comparable. Li et al. (2018) conducted a thorough search of different databases for pertinent RCTs from inception to February 2018 in order to explore the efficacy of CBT for patients with treatment-resistant depression and its long-term implications. A total of 847 persons participated in the study across 6 RCTs. The results of several studies indicated that CBT was a valuable technique for reducing the symptoms of depression. In terms of improving the rates of response and remission, CBT performed better than the control group. These adverse effects could appear right away following therapy and last for six months or perhaps a whole year. Furthermore, no publication bias was discovered. Attridge (2020) evaluated 4 “self-directed behavioral health support tools from Learn to Live, Inc. when offered as an employee benefit. Each of these automated online courses had 8 lessons that were specifically focused on the CBT approach. The study analyzes archival operational data gathered from various companies in the United States for 1,297 unique participants with longitudinal program use data. The validated measurements of clinical symptoms showed significant decreases specific for each program as follows: Depression (d = 0.93, n = 268; Insomnia (d = 0.69, n = 295; Medical Outcomes Study [MOS] Sleep), Patient Health Questionnaire–nine-item scale [PHQ-9]), Social Anxiety (d = 0.53, n = 170; Social Phobia Inventory [SPIN]), and Stress, Anxiety, & Worry (d = 0.50, n = 633; Generalized Anxiety Disorders–seven-item scale [GAD-7]).” Greater initial clinical severity and increased program participation (more classes used and usage of the optional live help from a coach or friend/family) were moderators of progress during the study. Results

from a subsequent survey (n = 290) showed great satisfaction as well as improved job performance and absenteeism from work. The anticipated financial benefit to the company from increased output was US$2,431 for each employee user. The “three attentional networks (alertness, orienting, and executive function) and other additional outcome measures (sleep, pain, daily functioning, and depression, anxiety) of fibromyalgia patients were” examined in a randomized control study by Miró et al. (2011). The study compared CBT for insomnia (n = 20) and sleep hygiene (SH, n = 20) programs. Significant improvement was found for the CBT group in alertness ($F(1, 28)= 11.84$, $p = .0018$), sleep quality ($F(1, 38) = 6.33$, $p = .016$), executive functioning ($F(1, 28) = 15.76$, $p = .00059$), and a pattern of improvement in daily performance ($p > .06$) when matched with the SH group. The improvements in sleep were substantially correlated with the improvement in executive functioning ($r = 0.40$, $p =.026$). Hence, it is suggested that CBT-I n effective treatment for fibromyalgia patients who experience sleep disturbances, attentional impairment, and possibly daily functioning.

Hypotheses of the study

1. Insomnia increases as the percentage of depression increases.

2. There is statistically significant differences between the depressed and non-depressed groups on the insomnia scale?

3. There is a statistically significant difference between both groups, the depressed and non-depressed groups, my reviewers at the Creative Minds Clinic, Amman, Jordan, on the insomnia test before and after they were subjected to a cognitive behavioural therapy program.

Methodology

The study employed an experimental research design. The sample of the study was taken 17 patients, 8 of whom were males and 9 females, diagnosed with depression by the doctor, their average age was 32.3 years, and 14 cases suffering from insomnia without depression were selected, 6 males and 8 females, their average age was 28.4 years, who went to the clinic to get rid of insomnia. The two experimental groups were subjected to the Beck test for depression and the dependence scale designed by Dr. Walid Al-Shatrat in 2001, after which both groups were subjected to cognitive behavioral treatment collectively, and then they were subjected to the same tests after being exposed to the treatment program.

Research Instrument:

1. Beck test for depression: a measure that uses self-esteem. Its image, expressed in the Jordanian environment, consists of 21 items that measure depression. The items of the scale represent the behavioral symptoms that characterize clinically depressed people. These symptoms are low mood, a sense of failure, pessimism, dissatisfaction, a sense of punishment, social withdrawal, loss of energy, loss of appetite, and loss of energy. Sexual desire, self-loathing, sleep disturbances, crying spells, self-accusation, desire to commit suicide, and poor ability to make decisions. The total score ranges from zero to 63 degrees, and from zero to 9 is considered not depressed, from 10 to 15 is mild depression, from 16 to 23 is moderately depressed, and from 24 or above means depressed Shadeed (Hamdi, Abu Hijleh, Abu Talib 1988) According to the truth, Ramzi Haroun 1992 took 56 individuals with whom clinical interviews were conducted, based on which the participants were distributed into two depressive and non-depressive groups, and the significance of the differences in performance was calculated on the list among the two groups, so it was statistically significant (0.001) The factorial structure was studied by means of common principle analysis, and the results of the factorial analysis of the Bick test items Arabized for the Jordanian environment were that only A test consisting of four main factors that together explain 45.5% of the total variance of the test. The stability of the list by repeating at a week interval was 0.88, and the value of the coefficient stability measured by the method of internal consistency using the equation of Cronbach alpha 0.87.

2. Insomnia test: The insomnia scale was used by Waleed Al-Shatrat, which was designed by him in 2001. It consists of 25 items, each of which represents one of the symptoms of insomnia that the patient suffers from during the previous month at least, at a time when the items consisted of six dimensions, the relationships between personality, social work, deep sleep and recurrence of sleep. Insomnia, continuing to sleep, and the onset of sleep. Each paragraph of the scale consisted of three alternatives, which were answered gradually. The scores on the overall scale ranged between 25-75 degrees, and the higher the score on the scale, the greater the suffering. The validity of the instrument was done, and the indications of the discriminatory validity of the scale P = 4.07 were extracted, and the stability was extracted by re-applying it on the same sample after luminous 4 weeks of the first application. is 0.8.

3. A cognitive behavioral therapeutic program, the duration of the session is 45 minutes. By 14 sessions.

The treatment: The program consisted of 14 treatment sessions, the duration of each session was 45 minutes each week, two sessions. In

each session, a cognitive behavioral method was used. A brief idea was presented to the members about this method, its usefulness, and justifications for its use. Patients discussed the benefits that this method could achieve. Also, each session included practical exercises aimed at training individuals in a method so that they can practice skills through the daily duties presented, which are discussed at the beginning of each session to provide feedback. When constructing this program, the researcher relied on methods derived from cognitive behavioral theory, which included methods (meichenbaum) in training on the skill of immunization against stress, dzurilla and goldfriend's method related to problem-solving exercises, karoly and kanfer in self-discipline, in addition to methods of meditation and control of stimuli in the treatment of delay in Starting sleep, stopping thinking and relaxing.

Results and discussion

The first section answers the hypothesis is there is statistically significant difference between the depressed in the mean degrees of depression between the pre- and post-application due to the training program, t-test analysis was carried out for non-independent samples. It is found that the average score of the depressed sample before applying the program was approximately 26, which decreased to approximately 16 after applying the treatment program. The differences between these two averages were statistically significant. The P value indicate that the therapeutic program used in this study, which is based on CBT was effective in minimizing the degrees of depression among depressed patients diagnosed by the clinic. The findings are presented in the following table

Table 1: t-test findings of depressed in the degree of depression

Variable	N	Mean	Std	t	P
Pre-treatment	17	25.82	6.51	16.35	0.00**
Post-treatment	17	16.41	6.38		

The analyses of the second hypothesis regarding the statistically significant difference among the depressed in the mean scores of insomnias between pre and post-treatment, t-test was conducted for non-independent samples, It is noted that the mean scores of insomnias among the depressed sample before applying the program were approximately 60, which decreased to approximately 46 after applying the treatment program. The differences between these two averages were statistically significant; This means that the treatment program used in this study contributed to reducing the levels of insomnia in patients with depression clearly. This is due to the

cognitive behavioral therapy techniques included in the program, such as relaxation, cognitive reconstruction, and others. The findings are included in Table 2.

Table 2: The finding of the t-test among the depressed in the degree of insomnia

Variable	N	Mean	St. D	t	Sig
Pre-treatment	17	59.82	4.67	52.85	0.00**
Post-treatment	17	45.71	7.48		

To answer the third hypothesis "Are there statistically significant differences between the non-depressed in the mean scores of depressions between the pre-application and the post-application due to the training program?" The t-test was used for non-independent samples. Table 3 indicates that the average score of the non-depressed sample before applying the program was approximately 11, which decreased to approximately 10 after applying the treatment program. The differences between these two averages were statistically significant; This is the result of the effect of the therapeutic program used in this study, which is based on cognitive behavioral therapy, which was aimed, through the tools and techniques used, to reduce insomnia and depression. Findings are presented in Table 3.

Table 3: The results of the t-test for non-independent samples of depression

Variable	N	Mean	St. D	t	Sig
Pre-treatment	17	10.42	2.28	17.33	0.00**
Post-treatment	17	10.14	1.96		

Finally, regarding “Are there statistically significant differences between the non-depressed in the mean scores of insomnias between the pre-application and the post-application attributable to the training program? A t-test was conducted for non-independent samples, it is noted that the average score for insomnia among a non-depressed sample before applying the program was approximately 40, which decreased to approximately 27 after applying the treatment program. The differences between these two averages were statistically significant; This means that the treatment program used in this study, which is based on cognitive behavioral therapy, was effective in reducing the levels of insomnia among a sample of patients who visited the clinic because of their suffering from insomnia. The results are as shown in

Table 4: The results of the t-test for non-independent samples of insomnia

Variable	N	Mean	St. D	t	Sig
Pre-treatment	14	39.50	6.06	24.39	0.00**
Post-treatment	14	26.71	1.90		

In order to answer the fifth question, which is "Are there any statistically significant differences between depressed and non-depressed people in each of depression and anxiety after applying the training program?" The means and standard deviations of the scores of the two groups were first calculated for each dimension. Table 5 shows these results.

Table 5: Findings of depression and insomnia scales pre and post-treatment

Variable	N	Mean	St. D	t	Sig
Pre-treatment	14	39.50	6.06	24.39	0.00**
Post-treatment	14	26.71	1.90		

It is noted that the average score for insomnia among a non-depressed sample before applying the program was approximately 40, which decreased to approximately 27 after applying the treatment program. The differences between these two averages were statistically significant; This means that the treatment program was effective in reducing the levels of insomnia.

In order to answer the fifth question, which is "Are there any statistically significant differences between depressed and non-depressed people in each of depression and anxiety after applying the training program?" The mean and standard deviations of the scores of the two groups were first calculated for each dimension. Table 6 shows these results.

Table 6: Findings of the depression and insomnia scales

Variable	Group	N	Mean	St deviation
Depression pre-treatment	Depressed	17	16.4118	6.38415
	Non-depressed	14	10.1429	1.95555
	Total	31	13.5806	5.78374
Insomnia pre-treatment	Depressed	17	45.7059	7.48135
	Non-depressed	14	26.7143	1.89852
	Total	31	37.1290	11.12278
	Depressed	17	25.8235	6.51187

Depression post treatment	Non-depressed	14	10.4286	2.27746
	Total	31	18.8710	9.24749
Insomnia post treatment	Depressed	17	59.8235	4.66684
	Non-depressed	14	39.5000	6.06059
	Total	31	50.6452	11.54281

It is clear from the table that the mean scores of the post-measurement for each of depression and insomnia was higher than the pre-treatment for both the depressed and non-depressed groups, and to identify the significance of the differences at the total level, multiple analysis of variance (MANOVA) was used. Table 7 shows these results.

Table 7: Multiple variance analysis of the impact on the group's post-treatment

Measurement	Test (Wilks Lambda)	Freedom	f	P
Post-treatment	0.123	4	46.51	0.000**

The data in Table (6) indicate that there are statistically significant differences on the two scales in the scores, where the level of significance was (0.000), which is less than ($\alpha \leq 0.05$) for the independent variable, meaning that the independent variable has a statistically significant effect on the variables, namely depression and insomnia. Multiple analysis of variance (MANCOVA) was used to find out the significance of the differences between the scores of the two groups on the two scales. Table 8 shows these results.

Table 8: MANCOVA analyses differences in the scores of the two groups in depression and insomnia

source of contrast	Dependent variable	Sum square	freedom	M of squares	f	*p*
Group	Depression post treatment	301.716	1	301.716	12.467	*0.00
	Insomnia post-treatment	2769.097	1	2769.097	85.213	*0.00
	Depression pre- treatment	1819.585	1	1819.585	70.744	*0.00
	Insomnia pre-treatment	3171.126	1	3171.126	111.339	*0.00
Pre-treatment	Depression post treatment	701.832	29	24.201		
	Insomnia post-treatment	942.387	29	32.496		
	Depression pre- treatment	745.899	29	25.721		
	Insomnia pre-treatment	825.971	29	28.482		
	Depression post treatment	6721.000	31			

Mistake	Insomnia post-treatment	46447.000	31			
	Depression pre- treatment	13605.000	31			
	Insomnia pre-treatment	83510.000	31			
Averaged total	Depression post treatment	1003.548	30			
	Insomnia post-treatment	3711.484	30			
	Depression pre- treatment	2565.484	30			
	Insomnia pre-treatment	3997.097	30			

It appears from the table that there are statistically significant differences between the depressed group and the non-depressed group in the tribal measurement; This indicates that there is an effect of the treatment program, that is, the average performance of individuals in the post-measurement has decreased compared to the average performance of individuals in the pre-measurement, after applying the training program. To find out the size of the effect of the treatment program among the variables, use Eta square values:

Table 9: the effect size of the variables

	Eta	Eta Squared
Depression group	0.548	0.301
Insomnia	0.864	0.746

It is clear from the existing data that the value of eta squared is close to zero, which indicates the effect of the independent variable, which is the counseling program, on the dependent variable, which is depression and insomnia. The explained variance was calculated: (eta squared x 100%): 0.301 X 100% = 30%, meaning that the treatment explained (30%) of the variance in the dependent variable with respect to depression, while the explained variance was calculated for insomnia: (eta squared x 100%): 0.75 x 100% = 75%, meaning that the treatment explained (75%) of the variation in the dependent variable for insomnia.

Discussion

The observed considerable reductions in insomnia symptoms in this study were consistent with earlier studies (Christensen, 2016) but this was one of the first trials to demonstrate a reduction in insomnia in people with concurrent depression. The large reductions in depression following CBT-I alone were likewise in line with earlier findings (Drerup & Ahmed-Jauregui, 2019; Ong & Smith, 2017). This study, however, was among the first to show that CBT-I alone was successful in drastically reducing depression scores in patients with co-occurring insomnia and depression. The study makes no claims that addressing moderate or severe depression will also address insomnia. These

findings simply show that individuals with at least mild depression can be treated for insomnia quickly and successfully, which also lessens the symptoms of depression. This study also raises the possibility that current empirically supported psychotherapies for depression could be made more effective by incorporating scientifically supported insomnia treatments (such as stimuli control and PMR). It is yet unknown why treating insomnia reduces the symptoms of depression. According to a theory put up by Sweetman et al. (2021), the connection between chronic insomnia and comorbid diseases like depression most likely conforms to Spielman's model of chronic insomnia (i.e., predisposition, precipitation, and perpetuation) (Chapoutot et al., 2021). Using this paradigm, the study assumes that additional stressful life events likely served as the catalyst for insomnia and depression in a person who was predisposed to these conditions. However, in at least some instances, patients cease connecting their insomnia to stress or depression and start connecting it to their bedroom. They also start to lose faith in their ability to fall asleep. Patients who are in this state experience dread and frustration, which become active each time they enter their bedroom at night, raising arousal and reducing the likelihood of getting a good night's sleep, creating a vicious cycle. Therefore, it is conceivable that the patient ends up staying up late in bed thinking of depressing thoughts, which causes the symptoms of depression to persist or worsen. Additionally, fatigue, a bad mood, trouble focusing, a loss in quality of life, and a decline in social functioning are all considered to be signs of depression that are also caused by insomnia (Trockel et al., 2015). As a result, treating insomnia should lessen patients' time spent lying awake in bed daydreaming, which some people think is a major contributing factor to depression (Trockel et al., 2015), as well as other symptoms like fatigue that are common in depression. These findings must be understood in the context of several limitations. One factor that may have made our sample more receptive to treatment for their insomnia was the fact that everyone in it had just minor pre-treatment depression. As a result, these findings cannot be broadly applied to patient populations with more severe conditions. In these populations, replication studies are required to see if comparable advances may be made. Furthermore, the absence of a control condition substantially restricts the capacity to conclude causes. It's likely that maturation or history contributed to the decrease in comorbid depressive symptoms caused by both insomnia and CBT for insomnia. Though modest placebo effects have been observed in patients with primary insomnia in earlier studies, this study anticipates that the results would have been the same in this population. In this trial, a control group would have been chosen if there had been more funding available, but since there was no funding, it was more crucial to demonstrate that we could cure insomnia in this patient population rather than "squander"

the few patients we had in a control group. Therefore, future studies will require a control group. Participants included in the study were also based on their satisfaction with the criteria for a major depressive episode within the previous six months; however, we did not test for recent major depression (i.e., within the previous month). As a result, we were unable to determine whether or not all patients were now experiencing significant depression. Additionally, the SCID was not used at the end of treatment; thus, the study could not estimate the proportion of individuals who had significant depression remission. To accurately assess and report depression, future research should use the whole CBTP at baseline, post-treatment, and follow-up. Finally, due to financial restrictions, objective sleep metrics were not used in this study. Since polysomnograms are primarily employed in insomnia research to (i) rule out organic sleep problems and (ii) make sure patients are being genuine in their self-report of sleep, it is not thought that this final deficiency was a significant contributing factor. The significance of this study would have been diminished if there were underlying sleep disorders, but as seen, this was not considered a problem (Lovato, et al., 2014). Additionally, even if the use of sleep diaries is not ideal, it is most likely to occur in clinical practice, increasing the generalizability of our findings. As predicted, after receiving CBT-I, there was a significant reduction in both insomnia and depression symptoms did lessen. Further study into treatment options for patients with insomnia and concomitant depression is needed given the significance of these findings in this large (20% of people with insomnia) understudied population (Edinger & Carney, 2014). Future studies should make an effort to build on these results with a broader, more severe population, using a Latin-square design where individuals get either depression treatment alone, CBT-I alone, a combination of the two, or a placebo.

Conclusion

This study serves as proof of the efficacy of dCBT-I in preventing depression, as well as an efficient treatment option for concurrent insomnia and depression. The results of the current investigations point to cognitive behavior therapy as an effective and long-lasting treatment for depression and insomnia. These positive effects of CBTP on depression seem to be mediated by reductions in the severity of insomnia. However, future studies should include clinical populations in large randomized controlled trials, with sample size and design that enable meaningful analyses of moderating and mediating factors, monitoring of both comorbid problems and measures of overall daytime function, to advance the field of CBTP in adolescents. The findings of this study should support the use of more structured

insomnia treatment, such as CBT. Additionally, more in-depth research is required to determine whether combining standard CBT treatment with a CBT therapy for insomnia is effective. The use of CBT-I in a stepped-care framework along with a higher level of care using face-to-face techniques are important next steps that must be tested to fully enhance patient results for depression and insomnia.

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