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Effects of Cognitive Behavioral Therapy and Psychoeducation on Reduction of Anxiety among Diabetes Mellitus Patients at Federal Medical Center Umuahia, Nigeria

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Abstract
This study examined the effect of cognitive behavioral therapy (CBT) and psychoeducation on reduction of anxiety symptoms among diabetes mellitus patient in Federal Medical Center Umuahia Abia State. Twenty-seven (27) diabetes anxiety patients whose ages ranged from 43-74 years with mean age 57.3 and standard deviation 9.6 participated in the study. The participants were grouped into three: Group A. (the control group) B. (CBT) and C. (psychoeducation.) Simple random samplings were used to place participant to the groups. The therapy session lasted for four weeks; three sessions per week each session lasted for 60 minutes. The participants were assessed using State Trait Anxiety Inventory (STAI), before and after the treatment. The study adopted a pretest and posttest between group design and the result were analyzed using one way analysis of variance (ANOVA). The first and second hypotheses were accepted at P <.05. Thus, participants who received CBT and psychoeducation intervention showed significant reduction in anxiety when compared to control group. Also, at F (3.2), p>.05 the third hypothesis which stated that CBT will reduce anxiety more when compared with psychoeducation was not accepted because it did not reach the significant level. Based on the finding, the researcher recommended that CBT and psychoeducation be employed in psychological treatment of diabetic patient with anxiety across different mental health settings.

Keywords: cognitive, behavioral, therapy, psychoeducation, anxiety

Introduction

Sick people whether hospitalized or not are always anxious about their recovery. Cockerham (2000), Young (2004). The discomfort of illness or disease constantly pushes sufferers to the brink especially with protracted illnesses. Cockerham (2012) In some cases, there is also the fear of death when the illness is lasting beyond the normal expected period of recovery, or if the illness/disease is perceived to have some management difficulty or associated high cost of treatment beyond the provision of the sufferer or their caregivers (Okwaraji, et al, 2017). According to Smith, Deschênes and Schmitz (2018), the

described conditions above can fundamentally usher in anxiety on the patient leading to several psycho-physiological conditions especially those that may affect the body metabolism. Typically, diabetes mellitus patients have been observed to develop a worrisome level of anxiety which appear to endanger their response to treatment (American Diabetes Association, 2019). In some cases, the situation may become severe and life-threatening requiring reduction through varying therapeutic techniques to keep them psychologically, physiologically, and physically healthy. (APA, 2019).

Inherently, the causes of anxiety among diabetes patient may not be unrelated to the challenges in managing the disease. Bearing in mind that the causes of anxiety among diabetic patients may be different, most times the treatment approaches toward the reduction of anxiety among diabetes patients may also not be effective across different patients in most cases. Thus, there is need to ascertain which treatment works best for certain patients given their similarities and differences; and this was the motivation for exploring the effect of cognitive behavioral therapy (CBT) and psychoeducation on reduction of anxiety among diabetes mellitus (DM) patients.

Diabetes mellitus commonly called ''sugar disease'' is a chronic metabolic disease characterized by elevated levels of blood glucose (blood sugar) beyond the normal required levels which affects other functioning of the body such as blood pressure, heart functioning, body metabolism among others. (American Diabetes Association, 2019). There are different diagnosed types of diabetes among which are commonly called Type 1 and Type 2. According to Saklayen (2018), diabetes mellitus is a global epidemic of the metabolic syndrome as it affects people of all countries, ages and classes. Common symptoms include but not limited to frequent urination, feeling very thirsty, feeling very hungry (even when you have eaten), extreme fatigue, blurred vision, cuts and bruises that are slow to heal, weight loss and so on (Kalra, et al, 2017).

Diabetes' increasing incidence and prevalence globally is of concern to health practitioners and researchers due to the associated morbidity and anxiety which comes with the disease as it is still among the most common causes of morbidity and mortality worldwide (Chatterjeeet et al 2018). People with diabetes are at increased risk of developing anxiety

because they may experience excessive fear of and worry about the management and possible progression of diabetes (American Diabetes Association, 2019;). Concerns over the physical symptoms themselves could also trigger anxiety and even fear of death (Greenwood et al, 2017).

Considering the dangers which may be associated with anxiety, in the developing world such as Nigeria with low levels of awareness and education on sugar disease, diabetes anxiety as a health burden is on the increase with. (APA, 2020) As a health concern, stakeholders (physicians, patients' caregivers, researchers) are increasing the search for effective therapies for the reduction of anxiety among diabetic patients. (ADA, 2019) In line with this search, the research explored the effects of CBT and Psychoeducation on anxiety among patients with diabetes mellitus.

Basically, Cognitive behavioral therapy popularly called CBT is a therapy that aims to reduce psychological distress and dysfunction by exploring and addressing how the integration of service users' thoughts, feelings and behaviors are contributing to the presenting problem (Fenn & Byrne, 2013). CBT explores the links between thoughts, emotions, and behavior. It is a directive, time-limited, structured approach used in treating a variety of mental health disorders (Ellis1988, Graham, 1998, Kendall, 2000). Its aim is to alleviate distress by helping patients to develop more adaptive cognitions and behaviors. (Essuman 1988, Thorpe & Olsen, !990) CBT in principle can help diabetic patients understand that the disease is surmountable, reassure them that they can follow the treatment procedure for recovery and management and can help eliminate negative thoughts which may be associated with fear (Robertson, 2019). Considering this general utility of CBT, the researchers believe that applying this therapy can help in the reduction of anxiety among patients with diabetes. Also, another therapy considered by the researchers to help in the reduction of anxiety among diabetic patient with anxiety is psychoeducation.

Psychoeducation is an evidence-based therapeutic intervention for patients and caregivers that provide information and support to better understand and cope with illness (Pitschel-et al, 2017). Psychoeducation offers patients and caregivers' knowledge regarding the use

of problem-solving and communication skills in an empathetic and supportive environment (Riehle, et al, 2017). It also provides education and resources on how to improve on wellbeing and helps to lower relapse to illness. Therefore, this study explored its effects on the reduction of anxiety among diabetes patients undergoing treatment in a medical facility.

Theoretically this study adopted the cognitive dissonance theory (Festinger 1957) as framework for the study apparently, several studies have examined the relationship between the variables.

Theoretically, this study adopted the cognitive dissonance theory propounded by Festinger (1957) as the framework for the establishment of association between the study variables. The theory was of the basic assumption that there exists internal conflict within a person, which is often caused by a discrepancy between what the person knows or thinks (cognition) and what the person see and experience ultimately, the theory unites the problems of diabetes patients which arguably and most times emanate from anxiety due to ignorance and lack of information and the proposed therapies (cognitive behavioural therapy and psychoeducation), which agreeably may help in the reduction of anxiety among patients with diabetes mellitus. Furthermore, the foundation of cognitive dissonance theory demonstrates the goal and principles of CBT and psychoeducation therapy in the elimination of dissonance by Ezegbe et al, (2019) investigated the impacts of cognitive-behavioral intervention on anxiety and depression among undergraduate students enrolled in social science education programs at public universities inthe Southeast Nigeria. In the methods, the participants were 55 undergraduate students enrolled in social science education programs at public universities in the Southeast Nigeria. The adequacy of the sample size used was determined using GPower software. Cognitive-behavioral treatment manuals on anxiety and depression were used to deliver the intervention. Data analyses were completed using repeated measures analysis of variance. The results indicated a significant positive impact of cognitive-behavioral intervention on anxiety and depression among social science education students exposed to the cognitive behavioral intervention when compared to the waitlisted group. Results also showed that there was a significant time × group interaction for anxiety and depression. Follow-up tests showed that significant reduction in anxiety and depression

persisted after 3 months for the cognitive-behavioral intervention group in comparison to the waitlisted control group. In line with the current study, it is concluded that cognitive-behavioral intervention was a successful intervention which decreased the symptoms of anxiety and depression in social science education students who participated in the study. In another study, Egenti et al, (2019) did a randomized controlled evaluation of the effect of music therapy with cognitive-behavioral therapy on social anxiety symptoms. The aim of their study was to examine the effects of music therapy with cognitive behavioral therapy on social anxiety in a sample of schooling adolescents in south-east Nigeria. In methods, they adopted a randomized controlled trial design involving a treatment group and a waiting-list control group. A total of 155 schooling adolescents served as the study sample. The sample size was ascertained using GPower software. A 12-week MTCBP manual for social anxiety was employed to deliver the intervention. Data analyses were completed using repeated measures analysis of variance. The results indicated that social anxiety significantly decreased in the treatment group over time, whereas the waitlist control group showed no significant changes in social anxiety. Therefore, music therapy with cognitive-behavioral therapy was significantly beneficial in decreasing social anxiety symptoms of the treatment group. The follow-up assessment performed after 3 months revealed a significant reduction in social anxiety for the treatment group. The study, therefore, suggests that the use of music therapy with cognitive-behavioral therapy is significant in reducing social anxiety among schooling adolescents.

Also, Uchendu and Blake (2017) studied the effectiveness of cognitive–behavioural therapy on glycaemic control and psychological outcomes in adults with diabetes mellitus as a systematic review and meta-analysis of randomized controlled trials. Their analysis of reviewed studies summarized diabetes as a chronic progressive condition presenting physical, social and psychological challenges that increase the risk of comorbid mental health problems. Cognitive–behavioural therapy (CBT) is effective in treating a variety of psychological disorders and may potentially improve glycaemic control and psychological outcomes in diabetes. This systematic review and meta-analysis aim to establish the effectiveness of CBT on glycaemic control and comorbid diabetes-related distress, depression, anxiety and quality of life in the short, medium and longer term among adults

with diabetes. In method, an electronic search was conducted in PubMed, Embase, MEDLINE, PsycINFO, CINAHL, Web of Knowledge, Cochrane Central Register of Controlled Trials and references in reviews. Twelve randomized controlled trials (RCTs) were identified that evaluated the effectiveness of CBT on at least one of: glycaemic control, diabetes-related distress, anxiety, depression or quality of life in adults with Type 1 or Type 2 diabetes. The Cochrane Risk of Bias Tool and Review Manager Version 5.3 were used for risk of bias assessment and meta-analysis, respectively. The result indicated that CBT is effective in reducing short-term and medium-term glycaemic control, although no significant effect was found for long-term glycaemic control. CBT improved short- and medium-term anxiety and depression, and long-term depression. Mixed results were found for diabetes-related distress and quality of life. The study concluded that CBT is beneficial in improving depression for adults with diabetes. It may have benefits for improving glycaemic control and other aspects of psychological health, although the findings are inconclusive.

Perrin, Bodicoat, Davies, Robertson, Snoek and Khunti (2019) explored the effectiveness of psycho-educational interventions for the treatment of diabetes-specific emotional distress and glycemic control in people with type 2 diabetes: a systematic review and meta-analysis. They investigated whether psychological comorbidity, such as depression and/or diabetes-specific emotional distress (DSD) is highly prevalent in people with type 2 diabetes (T2DM) and associated with poorer treatment outcomes. The authors noted that while treatments for depression are well established, interventions specifically designed for DSD are sparse. Thus, they focused on whether interventions that successfully address DSD and HbA1c in people with T2DM. After analysis, the results demonstrated that interventions significantly reduced DSD ($p = 0.034$) and HbA1c ($p = 0.006$) compared to controls, although mediation factors were not established.

Finally, Ran, Chan, Ng, Guo and Xiang (2015) did a study on the effectiveness of psychoeducational family intervention for patients with schizophrenia in a 14-year follow-up study in a Chinese rural area. In this study, the authors explored the 14-year effect of psychoeducational family intervention for patients with schizophrenia in a Chinese rural

area. The data from a cluster randomized control trial (CRCT) study of psychoeducational family intervention in a 14-year follow-up was analyzed. All patients with schizophrenia (*n* = 326) who participated in the CRCT drawn from six townships in Xinjin County of Chengdu in 1994, of whom 238 (73.0%) who were still alive, and their informants were followed up in 2008. The Patients Follow-up Scale, the Positive and Negative Syndrome Scale (PANSS) and the Global Assessment of Functioning were used in the follow-up study. The findings showed that there were no significant differences of marital status, mean scores of PANSS positive symptoms, negative symptoms, general mental health, and total scores among the psychoeducation family intervention, medication, and control groups in 2008. The psychoeducation family intervention group had a significantly higher rate of antipsychotic medication and a higher level of work ability than other two groups. The control group had a significantly higher rate of never treated (26.0%) than psychoeducational family intervention group (6.5%). Findings concluded that psychoeducational family intervention might be still effective in the 14-year follow-up, especially in patients' treatment adherence/compliance and social functioning. ed when making mental health policy and planning mental health services.

Theoretical Framework

The foundations of the cognitive dissonance theory acknowledge the goal and principles of CBT and psycho-education therapy which is to eliminate dissonance by: (1) reduce the importance of the dissonant beliefs, (2) add more consonant beliefs that outweigh the dissonant beliefs, or (3) change the dissonant beliefs so that they are no longer inconsistent. They achieve these by:

a. Change one or more of the attitudes, beliefs, etc., to make the relationship between the two elements a consonant one. When one of the dissonant elements is a behavior, the individual can change or eliminate the behavior.
b. Acquire new information that outweighs the dissonant beliefs.
c. Reduce the importance of the cognitions. A person could convince themselves that it is better to "live for today" than to "save for tomorrow."

These steps are in congruence with the practice of CBT and Psycho-education as well as cognitive dissonance theory, and are the main thrust of this study especially with the treatment group.

Purpose of the study

The purpose was to assess whether CBT could reduce anxiety among diabetes mellitus patients. To examine whether psychoeducation could reduce anxiety of patients living with diabetes. To compare whether CBT would reduce anxiety more compared to psychoeducation in patients living with diabetes mellitus

Hypotheses

The following hypotheses guided the study:

1. Cognitive Behavioral Therapy would significantly reduce anxiety among diabetes mellitus patients when compared with the control group.
2. Psychoeducation would significantly reduce anxiety among diabetes mellitus patients when compared with the control group
3. Cognitive Behavioral therapy would significantly reduce anxiety more when compare with psychoeducation.

Methods

Participants

The participants in this study were 27 diabetes patients selected from the Endocrinology clinic of the Federal Medical Centre Umuahia, whose ages ranged from 43 to 74 years, with a mean age of 57.3 and Std. of 9.6. Inclusion criteria for the participants included: having been admitted or undergoing diabetes treatment; and score above .63 indicating severe level of anxiety in STAI. Exclusion criteria include Patients who do not meet the inclusion criteria**,** Patient who are Unwilling. The purposive sampling technique was adopted in the selection of the participants.

Instruments

The instrument of data collection was State-Trait Anxiety Inventory (STAI) by Spielberger (1983). STAI is a 40-item self-report measure of anxiety using a 4-point Likert-type scale (from 0 to 3 points) for each item. All items were rated on a 4-point scale (e.g., from "Almost Never" to "Almost Always"). It has two scales: State anxiety, i.e. how one feels now; and Trait anxiety, i.e. how one generally feels. Both scales consist of 20 items. The state scale has 10 reverse-scored items, the trait scale has 7. The range of possible scores for form Y of the STAI varies from a minimum score of 20 to a maximum score of 80 on both the STAI-T and STAI-S subscales. STAI scores are commonly classified as "no or low anxiety" (20-37), "moderate anxiety" (38-44), and "high anxiety" (45-80). Higher scores indicate greater anxiety. State anxiety items include: "I am tense; I am worried" and "I feel calm; I feel secure." Trait anxiety items include: "I worry too much over something that really doesn't matter" and "I am content; I am a steady person."

Internal consistency coefficients for the scale have ranged from .86 to .95; test-retest reliability coefficients have ranged from .65 to .75 over a 2-month interval (Spielberger et al., 1983). Test-retest coefficients for this measure in the present study ranged from .69 to .89. Considerable evidence attests to the construct and concurrent validity of the scale (Spielberger, 1989). In this study, concurrent validity was performed by correlating STAI with Domain 5 (anxiety) of Symptoms Checklist by Darogatis, Lipman and Covi (1977) and correlation coefficient of .67 was obtained ascertaining high correlation between the scales.

Procedure

The therapy sessions were conducted by a practicing clinical psychologist with post graduate qualifications, over 15 years' experience in clinical services. The therapies spanned (12) sessions, which lasted for 4 weeks (3 sessions per week). The choice of 12 sessions of cognitive behavioural therapy and psychoeducation intervention was influenced by the fact that reviewed literature confirmed that both short- and long-term application of both were very effective. The therapies were conducted in group setting since group therapy has the added benefits of positive social interaction, empathy, and support from peers. The therapy involved a pre-test, treatment stage and post-test. During the pre-test stage, participants were assessed to determine the severity of anxiety symptoms before the therapy. Random assignment was used to place participants to the

three groups A. B and C. During the treatment two participants were lost to CBT therapy and one was lost to Psychoeducation intervention All the participants were administered STAI.

Those in group A were called Control group and was not given treatment but served as control group for group B and C, who were the Experimental groups. Group B was treated with CBT and group C was treated with CBT and Psychoeducation.

Design and Statistics

The study adopted an experimental design. The study was pretest, posttest between group designs that made up of Group A for control, Group B for cognitive behavioral therapy, and Group C for the psycho education. The statistics used for this study was Two-way Analysis of Variance (2-Way ANOVA) which was used to analyze the between group results of the experimental and control groups.Statistical Package for Social Sciences (SPSS, version 23) was used to manage the data.

Result

Table 1: Descriptive statistics showing pretest anxiety scores of patients prior to the intervention/treatment with CBT and psychoeducation.

Treatment Type	Mean	N	Std. Deviation	Std. Error of Mean
No Treatment	40.6667	9	6.94622	2.31541
Psychoeducation	40.1000	10	5.64604	1.78543
CBT	40.2500	8	5.65054	1.99777
Total	40.3333	27	5.87694	1.13102

Data from Table 1 revealed that pretest mean score of all participants was M = 40.3 (n = 27) which is an indication of moderate level anxiety. When the participants were divided into control and experimental groups (CBT and psychoeducation), the pretest mean score stood at 40.6, 40.1 and 40. 3 respectively for no treatment group (n = 9), psycho-education group (n = 10) and CBT group (n = 8). The groups' mean scores were like the overall mean score of all participants.

Table 2: Descriptive statistics showing posttest anxiety scores of patients after the intervention/treatment with CBT and psychoeducation.

Treatment Type	Mean	N	Std. Deviation	Std. Error of Mean
No Treatment	39.2222	9	6.74125	2.24708
Psycho-education	31.9000	10	5.06513	1.60174
CBT	28.7500	8	4.92080	1.73977
Total	33.4074	27	6.97390	1.34213

Data in Table 2 reveals that after treatment (on the experimental group) the posttest scores of participants stood at M = 39.2 (n = 9) for no treatment group, 31.9 (n =10) for psycho-education group and 28.8 (n = 8) for CBT group. On the overall, the posttest means score for all participants stood at M = 33.4 (n = 27) which indicated a statistical drop in anxiety for all participants after the treatment/intervention. However, a between subject effect analysis was required to confirm whether this initial statistical difference in the mean scores between the pretest and the posttest was of significant value.

Table 3: ANOVA on the effect of CBT and psychoeducation on anxiety among diabetes Patients.

Dependent variable: Posttest Anxiety

Source	Type I Sum of Squares	Df	Mean Square	F	Sig.

Corrected Model	500.563[a]	2	250.281	7.863	.002
Intercept	30133.481	1	30133.481	946.657	.000
Pretest	1.600	2	.800	.021	.979
Treatment	500.563	2	250.281	7.863	.002
Error	763.956	24	31.831		
Total	31398.000	27			
Corrected Total	1264.519	26			

a. R Squared = .396 (Adjusted R Squared = .346)

Data in Table 3 revealed that the initial statistical group difference noticeable after the treatment among the control and experimental groups (no treatment, psychoeducation and CBT) was statistically significant at F = 7.9*, p < .05 (n = 27). The finding implies that comparing the pretest anxiety mean scores and posttest anxiety means among the groups, those in the experimental group (psychoeducation and CBT) had significantly less anxiety than they did before the treatment whereas no significant difference was found in the posttest anxiety scores of patients in the control group who received no treatment. Hence, the statistically significant difference noticeable in the experimental group could be said to have resulted from the treatment (psychoeducation and CBT) given to the experimental group. Therefore, the treatment is responsible for observed reduction of anxiety in experimental group.

Table 4: Pair wise comparison among groups (no treatment, psychoeducation, and CBT) on the effect of treatment on anxiety among diabetes patients

Dependent variable: Posttest Anxiety

(I) Treatment Type	(J) Treatment Type	Mean Difference	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]

		(I-J)			Lower Bound	Upper Bound
No Treatment	Psychoeducation	7.322*	2.592	.009	1.972	12.672
	CBT	10.472*	2.741	.001	4.814	16.130
Psychoeducation	No Intervention	-7.322*	2.592	.009	-12.672	-1.972
	CBT	3.150	2.676	.251	-2.373	8.673
CBT	No Intervention	-10.472*	2.741	.001	-16.130	-4.814
	Psychoeducation	-3.150	2.676	.251	-8.673	2.373

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Data in Table 4 revealed that comparing the posttest effect of the treatment among the groups, patients in the experimental group who received psychoeducation as treatment significantly had reduced anxiety with a mean difference of 7.3, $p < .05$ when compared to the no treatment group (control) who received no treatment. Thus, comparing the effects of psychoeducation with the control group and hypothesis I which stated psychoeducation will significantly reduce anxiety among diabetes mellitus patients when compared with the control group is confirmed.

Also, patients in the experimental group who received CBT as treatment significantly had reduced anxiety with a mean difference of 10.5, $p < .05$ when compared to the no treatment group (control) who received no treatment. Thus, comparing the effects of CBT with the control group and hypothesis II which stated CBT will significantly reduce anxiety among diabetes mellitus patients when compared with the control group is confirmed.

However, comparing the effects of psychoeducation and CBT as treatments on patients' anxiety, pair wise comparison analysis indicated that although statistical difference was observed at a mean difference of F 3.2, $p = .251$ an indication that the mean difference between psychoeducation and CBT did not reach significant proportions. Hence,

hypothesis III which stated that cognitive behavioral therapy will significantly reduce anxiety more when compare with psychoeducation is not confirmed.

Discussion

In hypothesis one, statistical evidence indicated that after treatment (on the experimental group only) the posttest anxiety scores of participants who received CBT were lower than those of the control group who received no treatment. This statistical difference was confirmed, significant indicating that CBT treatment given to the experimental group was responsible for the reduced anxiety among patience. The finding is supported by Pontow et al. (2020) who found that CBT was helpful in the treatment of disease-specific psychological distress in diabetes mellitus. In relation to the current study, using of similar design, the efficacy of CBT was extended to the reduction of anxiety among patients in Nigeria. Thus, the similarity of the findings of this study greatly supports the current study whose findings revealed that CBT helped in the reduction of anxiety among patient.

Also, the study was supported by the findings of Pan et al. (2020) this study emphasizing that CBT is efficacious in the reduction of psychological distress such as anxiety among patients ir

respective of difference in cultural background. This is equally supported by Yang et al. (2020) which found that the therapeutic effects of cognitive behavioral therapy - based intervention helped in improving glycemic, psychological, and physiological outcomes in adult patients with diabetes mellitus.

Findings with the Nigerian sample equally support the result of result of hypothesis I; for instance, Ezegbe et al. (2019) who investigated the impacts of cognitive behavioural intervention on anxiety among undergraduates found that there was significant positive impact of cognitive-behavioral intervention on anxiety and depression among patients exposed to the cognitive-behavioral intervention when compared to the control group. In line with the current study, it is concluded that cognitive-behavioral intervention was a successful intervention which decreased the symptoms of anxiety following exposure to the treatment. Furthermore, the finding is supported by Egenti et al (2019) who found that the combination of music therapy and CBT as a therapy reduced social anxiety symptoms.

Such support was also render by Uchendu and Blake's (2017). The finding of the first hypothesis, coupled with some empirical works reviewed has demonstrated that when people are giving CBT, they can actually get relieve from their psychological illnesses such as anxiety.

In hypothesis II, findings revealed that patients in the experimental group who received psychoeducation as treatment significantly had reduced anxiety with a significant mean difference when compared to the no treatment group (control) who received no treatment. Thus, comparing the effects of psychoeducation with the control group, hypothesis II which state that psychoeducation will significantly reduce anxiety among diabetes mellitus patients when compared with the control group is confirmed. This confirmation is supported by Perrin et al. (2019) study which found that psycho-education intervention for the treatment of diabetes specific emotional distress such as anxiety with patients with Type 2 diabetes was effective in the reduction of such emotional distress. Equally, Isworo and Sitepu (2019) found that psychoeducation helped to reduce family burden associated with diabetes patients.

Lastly, hypothesis III compared the effectiveness of CBT and psychoeducation in the reduction of anxiety among patients found that although, patients who received CBT therapy showed statistically lower anxiety when compared with their counterparts who received psychoeducation, however the initially observed statistical difference between the efficacy of CBT and psychoeducation did not reach significant proportion. This implies that cognitive Behavioral therapy did not significantly reduce anxiety more than psychoeducation. This outcome is supported by a lot of empirical evidence which consistently support the efficacy of CBT and psycho-education therapies in the reduction of anxiety among patients with diabetes.

Perhaps, the similarity between CBT and psychoeducation as forms of cognitive sensitization and mental stimulation therapy which capitalize on the patients' cognitive training and awareness regarding truths and half truths about the disease, the efficacy of the treatment, the hope of recovery and general positivity about the conditions. Both therapies seem to provide the sufferers with knowledge and practices which have been practicalized and have proven efficacious in the reduction of anxiety burden. Considering the position of empirical literature, literature is consistent that both therapies have been

employed severally and effectively for the reduction of anxiety and the burden associated with the disease.

In view of this, evidence provided that CBT and psychoeducation are adequate therapeutic measures in the reduction of anxiety and burdens associated by the disease, the current findings that CBT is not more effective than psycho-education therapy is upheld. It is also considered that many studies considering their efficacy jointly utilize the two therapies as quicker reduction of anxiety and health and psychological burden associated with the disease.

Implications of the Study

1. The finding of this study implies that the benefit of alternative forms of therapy cannot be disregarded in the therapeutic process. The participants in the study benefitted from- alternative psychotherapeutic interventions that reduced their level of anxiety symptoms.
2. The finding of the study also implies that data has been added to the limited body of information available on the efficacy of cognitive behavioral therapy and psychoeducation on the reduction of anxiety in Nigeria. The findings of this work can be used for reference purposes.
3. The findings of this study will help in devoting attention to the application and use of psychological techniques in the management of mental disorders within the Nigerian population.
4. The findings of this study will also reveal in no small measure how quest for meaning can be utilized as a therapeutic tool.

Limitations of the Study

This research study was restrained by the following limitations:

1. Nigerians are yet to come to terms with psychological therapeutic modalities and their benefits. Most of the patients that have diabetes anxiety were not convinced that their anxiety symptoms can be taken care of with mere talking therapy. This problem was overcome through rigorous persuasion to convince the respondents to participate.
2. All the participants heard of psychoeducation for the first time, and it took time to tell them about psychoeducation and CBT and how it operates.

Recommendations

Based on the findings, the researchers made the following recommendations:

Mental health professionals across different settings; hospitals, schools, prisons, should employ cognitive behavioral therapy and psychoeducation in the management of anxiety.

Interventions may be combined to increase the potency and speed of recovery by patient.

The researcher recommends that clinician should be trained in the administration of these psychological treatment approach CBT and psychoeducation. It is further recommended that clinicians should use the search for purpose as a therapeutic tool in the management of anxiety.

Conclusion

This study evaluated the effect of CBT and psychoeducation on anxiety among diabetes patients. Being an experimental study, the study adopted between subject design and two-way ANOVA as appropriate design and statistics for the study using STAI as instrument to measure patients' anxiety. After analysis of data, the result revealed that treatment with both proposed therapies (CBT and psychoeducation) with the experimental group reduced anxiety among diabetes patients. Moreover, it was ascertained that CBT was not more efficacious in the reduction of anxiety than psychoeducation.

References

Ameriacan psychiatric Association. (2020). What are anxiety disorders? (https://www.psychiatry.org/patients families/anxiety-disorders).

American Diabetes Association. (2017). 2. Classification and diagnosis of diabetes. *Diabetes care, 40(Supplement 1*), S11-S24.

American Diabetes Association. (2019). *Diabetes Technology.* Review of the 2019 American Diabtes Association Standards of medical care Diabetes.

Anastasiades, M. H., Gupton, O. A., Fritz, A., Caldaza, P. J., &Stillman, M. A. (2016). Diabetes, depression and nonadherence: exploring hopelessness as a meditating factor: a preliminary study. *Ment Health Fam Med*, *12*, 243-249.

Batra, B. S., Saoji, A. M., Batra, S., &Batra, D. S. (2018). Effect of family psycho education on knowledge, quality of life, expressed emotions, burden of disease and coping among caregivers of patients with schizophrenia. *IOSR J Dent Med Sci*, *17*, 59-73.

Bickett, A., &Tapp, H. (2016). Anxiety and diabetes: innovative approaches to management in primary care. *Experimental Biology and Medicine*, *241*(15), 1724-1731.

Brehm, J. & Cohen, A. (1962). *Explorations in Cognitive Dissonance.* New York: Wiley.

Chatterjee, S., Khunti, K., & Davies, M. J. (2017). Type 2 diabetes. *The Lancet, 389*(10085), 2239-2251.

Chien, I. C., & Lin, C. H. (2016). Increased risk of diabetes in patients with anxiety disorders: A population-based study. *Journal of Psychosomatic Research, 86*, 47-52.

Chiesa, A., Castagner, V., Andrisano, C., Serretti, A., Mandelli, L., Porcelli, S., &Giommi, F. (2015). Mindfulness-based cognitive therapy vs. psychoeducation for patients with major depression who did not achieve remission following antidepressant treatment. *Psychiatry Research, 226*(2-3), 474-483.

Chisholm, D., Sweeny, K., Sheehan, P., Rasmussen, B., Smit, F., Cuijpers, P., &Saxena, S. (2016). Scaling-up treatment of depression and anxiety: a global return on investment analysis. *The Lancet Psychiatry, 3*(5), 415-424.

Cockerham, W. (2000). *Medical sociology*. Prentice Hall.

Cockerham. W. C. (2012). *Medical sociology*. Prentice Hall.

Egenti, N. T., Ede, M. O., Nwokenna, E. N., Oforka, T., Nwokeoma, B. N., Mezieobi, D. I., & Ezeh, N. E. (2019). Randomized controlled evaluation of the effect of music therapy with cognitive-behavioral therapy on social anxiety symptoms. *Medicine,* 98(32).

Ellis, A. (1988). Albert Ellis on the essence of RET. Psychology Today, 5 - 8.

Essuman, J. K. (1988). Behavioral approaches to counseling. In C.C. Achebe (eds.). *Theories of individual counselling: Relevance to Nigerian Situation*. Amherst: Five college Black Studies Press.

Ezegbe, B. N., Eseadi, C., Ede, M. O., Igbo, J. N., Anyanwu, J. I., Ede, K. R., ... &Omeje, G. N. (2019). Impacts of cognitive-behavioral intervention on anxiety and depression among social science education students: A randomized controlled trial. *Medicine, 98*(15), 192-207.

Fenn, K., & Byrne, M. (2013). The key principles of cognitive behavioural therapy. *InnovAiT, 6*(9), 579-585.

Festinger, L. (1957). A theory of cognitive dissonance. Stanford University Press.

Festinger, L., & Carlsmith, J.M. (1959). Cognitive Consquences of Forced Compliance. *Journal of Abnormal and Social Psychology, 58*, 203-210. http://psychclassics.yorku.ca/Festinger.

Foster, N. C., Beck, R. W., Miller, K. M., Clements, M. A., Rickels, M. R., DiMeglio, L. A., & Olson, B. A. (2019). State of type 1 diabetes management and outcomes from the T1D Exchange in 2016–2018. *Diabetes technology & therapeutics*, *21*(2), 66-72.

Graham, P. (1998). *Cognitive behaviour therapy for children and families*. Cambridge University Press

Harmon-Jones, E. E. (2019). *Cognitive dissonance: Reexamining a pivotal theory in psychology* (pp. xvi-303). American Psychological Association.

Harmon-Jones, E., & Mills, J. (2019). An introduction to cognitive dissonance theory and an overview of current perspectives on the theory.

Hayes, S. C., & Hofmann, S. G. (2017). The third wave of cognitive behavioral therapy and the rise of process-based care. *World Psychiatry*, *16*(3), 245-259.

Heffner, C.L. (2001). Psychology 101. Chapter 8: Social Psychology. Retrieved January 3, 2010, from http://www.allpsych.com/psychology101/attribution_attraction.html.

Hinojosa, A. S., Gardner, W. L., Walker, H. J., Cogliser, C., &Gullifor, D. (2017). A review of cognitive dissonance theory in management research: Opportunities for further development. *Journal of Management*, *43*(1), 170-199.

Isa, E. W., Ani, C., Bella-Awusah, T., &Omigbodun, O. (2018). Effects of psychoeducation plus basic cognitive behavioural therapy strategies on medication-treated adolescents with depressive disorder in Nigeria. *Journal of Child & Adolescent Mental Health*, *30*(1), 11-18.

John B., Henry N. G., & George, D, (2019). *Primary prevention of cardiovascular diseases in people with diabetes mellitus*. A scientific statement from the American Heart Association and American diabetes Association.

Kaczkurkin, A. N., &Foa, E. B. (2015). Cognitive-behavioral therapy for anxiety disorders: an update on the empirical evidence. *Dialogues in clinical neuroscience*, *17*(3), 337-351.

Kai G, Ulrich S., Christoph C., Muller C., Marieluise B., Michael B, Peter Schwarz (2015). Depression, Anxiety disorders, and Metabollic Syndrome in a population at risk for type 2 diabetes mellitus. Published online 2015.

Kalra, S., BiranchiNarayan J., Rajiv Y., (2017). Emotional and psychological needs of people with Diabetes. Published online September 2018.

Kendall, P. C. (2010). *Cognitive behaviour therapy for anxiety in children*. Workshop Publishing.

Lawal, A. M., &Olley, B. O. (2015). Investigating the efficacy of HIV/AIDS psycho-education and behavioural skills training in reducing sexual risk behaviors in a trucking population in Nigeria. *International Journal of Medical, Health, Biomedical and Pharmaceutical Engineering*, *9*(4), 318-322.

Levitt, E. E. (2015). *The psychology of anxiety*. Routledge.

Li, C., Xu, D., Hu, M., Tan, Y., Zhang, P., Li, G., & Chen, L. (2017). A systematic review and meta-analysis of randomized controlled trials of cognitive behavior therapy for patients with diabetes and depression. *Journal of psychosomatic research*, *95*, 44-54.

Locke, A., Kirst, N., & Shultz, C. G. (2015). Diagnosis and management of generalized anxiety disorder and panic disorder in adults. *American family physician*, *91*(9), 617-624.

Martelleti P., Negro, A. (2019). Serotonin receptor agonists in the acute treatment of migraine: a review on their therapeutic potential.

Newby, J. M., Smith, J., Uppal, S., Mason, E., Mahoney, A. E., & Andrews, G. (2018). Internet-based cognitive behavioral therapy versus psychoeducation control for illness anxiety disorder and somatic symptom disorder: A randomized controlled trial. *Journal of consulting and clinical psychology*, *86*(1), 89-101.

Sanjay Kalra, Komal, YP Balharasingh (2017) management of diabetes distress. The journal of the Pakistan Medical Association 67.

Smith, K.J. Deschenes, S.S. Schmitz, N. (2018). *Investigating the longitudinal association between diabetes and anxiety; a systematic review and mata- analysis*. Diabetic medicine

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press. KamleshKhunti (2018). Diabetes structured self-management education programs; a narrative review and current innovations pages 130-142.

Tuma, A. H., & Maser, J. D. (2019). *Anxiety and the anxiety disorders*. Routledge.

Uchendu, C., & Blake, H. (2017). Effectiveness of cognitive–behavioural therapy on glycemic control and psychological outcomes in adults with diabetes mellitus: a systematic review and meta-analysis of randomized controlled trials. *Diabetic Medicine*, *34*(3), 328-339.

Wickland, R. &Brehm, J. (1976). *Perspectives on Cognitive Dissonance.* NY: Halsted Press.

Xia, J., Merinder, L. B., &Belgamwar, M. R. (2011). Psychoeducation for schizophrenia. *Cochrane database of systematic reviews*, *2*(6), 33-47.

Young, J. C. (2004). Illness behaviour: A selective review and synthesis. Sociology of Health and Illness, 26(1),1-31.