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The Efficacy of Cognitive Behavioural Therapy on the Psychosocial Well-Being of Patients diagnosed with HIV/AIDS Associated Cancers in Jos University Teaching Hospital, Plateau State, Nigeria

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Abstract. The study investigated the efficacy of Cognitive Behavioural Therapy on the Psychosocial Well-being of Patients diagnosed with HIV/AIDS Associated Cancers in Jos University Teaching Hospital, Plateau State, Nigeria. True experimental design was utilized (pretesting and post-testing for both experiment and control groups). Thirty Nine (39) diagnosed HIV/AID associated cancer patients in Jos University Teaching Hospital were purposively sampled and divided into treatment (n=20) and control groups (n=19). The Ryff's psychosocial wellbeing scale (PWB), 42 items version, was administered to pretest and posttest for psychological wellbeing in both groups. T-test was then applied to test the six hypotheses developed in the study. For hypothesis one, the results of the analysis of the posttest autonomy mean scores of HIV/AIDs patients diagnosed with associated cancer between the experimental and control groups. In the experimental group, the posttest autonomy mean scores is $\bar{x}$ =27.77, SD = 6.13 where the control group had a mean scores $\bar{x}$ =24.75, SD = 5.60. The result also shows t(37) = 2.60, p< 0.05. The second hypothesis showed that the experimental group environmental mastery had a posttest mean scores of $\bar{x}$ =29.88, SD = 6.22 while the control group has a posttest mean scores of $\bar{x}$=25.04, SD = 5.59. The results indicates that t(37) = 2.38, p < 0.05. The third hypothesis reveals that the experimental group had a posttest personal growth mean scores of $\bar{x}$ =26.83 and SD =.64 while the control group has a posttest mean scores of $\bar{x}$ =25.80 and SD=5.57. The results indicate that t(37) = 0.84, p < 0.05. Hypothesis four shows that the experimental group had a posttest Positive Relation mean scores of $\bar{x}$ =26.55, SD = 6.54 while the control group had $\bar{x}$ =23.19, SD = 5.11. The results also indicate that t(37) = 2.12, p< 0.05. Hypothesis five indicates that the experimental group had a posttest purpose in life mean scores of $\bar{x}$ =26.38, SD, = 5.08 while the control group has $\bar{x}$24.00, SD = 5.49. The results indicate that t(37) = 1.81, p< 0.05. Hypothesis six shows that the experimental group had a posttest self-acceptance mean scores of 30.22, standard deviation 5.23 while the control group had a posttest mean scores of 23.33, SD= 5.60. The results indicate that t(37) = 4.82, p< 0.05. Cognitive Behavioral Therapies has been shown to efficacious by several researchers as confirmed by this study especially for the unique population of HIV/AIDs associated cancer patients and it is therefore highly recommended that the treatment of HIV/AIDs associated cancer patients should incorporate the services of mental health practitioners with skills in CBT.

Keywords: Cognitive Behavioural Therapy, Psychosocial Well-being, HIV/AIDS Associated Cancers

1. Introduction / Background of the Study

Psychosocial Well-being refers to positive mental health of humans and is of diverse multi-dimensional concept that develops through a combination of emotional regulation, personality characteristics; identity and life experience (Ryff, 1989b). Psychosocial well-being can increase age, longevity and consciousness (Keyes et al., 2002). There is

much more to good mental health than pleasant emotions. A true satisfying life/ includes, purpose and direction. Human beings need to act in accordance with personal values and contribute to things cared about, such as relationship with family and friends, meaningful work, community and order, purpose in life, fulfilling one's potentials through the use of autonomy, competence, healthy relationships, self-acceptance, personal growth and purpose in life. The two important ingredients in psychosocial well-being are subjective happy feelings brought on by something enjoyed and the feeling that what is being done with one's live has some meaning and purpose. Patients diagnosed with HIV/AIDS associated cancers need hope and reason to live a meaningful and purpose filled lives. This purpose filled life is measured by these six key elements of psychosocial well-being which are-: autonomy, environmental mastery and competence, healthy relationship, self-acceptance, personal growth, and purpose filled life (Keyes et al., 2002).

The challenges encountered in the management of HIV/AIDS associated malignances in Nigeria, reflect the double burden of management of cancers in general and HIV/AIDS associated cancers in particular low resource environment with weak public health infrastructure and ignorance. Prior to the advent of programmes like PEPFAR, Global Funds and others, there was little health care available for people living with HIV/AIDS in Nigeria, just like what is happening now with cancer. There is no similar intervention for people with cancer. The proportion of cancer patients with access to treatment is significantly low due to poverty and lack of adequate education and awareness about HIV associated cancers and how a patient infected with this disease can be helped (Akinwande et al. 2009).

This underscores the relevance of Cognitive Behavioural Therapy (CBT) as an intervention to improve the psychosocial well-being of patients diagnosed with HIV/ AIDS associated cancers, who, from the researcher's experiences in working with such clients lack skills to cope with life threatening psychosocial issues. Cognitive Behavioural Therapy has proven helpful in effectively stabilize the psychosocial well-being of patients diagnosed with HIV/AIDS to a purpose filled life. HIV/AIDS pandemic has been topical, since the identification of the disease. It has devastated many countries especially in sub-Saharan Africa, and indeed a major event of contemporary time in spite all interventions other then psychotherapy, by relevant bodies like; Joint United Nations Programme on HIV/AIDS (UNAIDS), United States Agency for International Development (USAID) among others. In 2013, an estimated 35.0(33.2-37.2, range around estimate) million people are living with HIV worldwide, sub-Saharan Africa has only 12% of the global population, yet accounts for 74% of the global burden of HIV infection. Ten countries, mostly in southern and Eastern Africa - South Africa (25%), followed by Nigeria (13%), Mozambique (6%), Uganda (6%), Tanzania (6%), Zambia (4%), Zimbabwe (6%), Kenya (6%), Malawi (4%) and Ethiopia (3%), these accounts for almost 80% of all people living with HIV/AIDS worldwide (Akinwande et al. 2009).

Cognitive Behavioural Therapy is a psychosocial intervention that aims at improving the mental health conditions of clients diagnosed with HIV/AIDS associated cancers who present maladaptive cognitive functioning. It focuses on challenging and changing unhelpful cognitive distortions (thoughts) and behaviours, improving emotional regulation, and the development of personal coping strategies that target solving current problems. It is also a type of therapy in which negative patterns of thoughts about the self and the world are challenged in order to alter unwanted behaviour patterns.

Cognitive Behavioural Therapy (CBT) is a type of psychotherapeutic treatment that helps patients understand the thoughts and feelings that influence behaviours. With the help of CBT, patients will learn how to identify and change destructive or disturbing thought patterns that have a negative influence on behaviour and emotions in relation to their health and how they are accepting their faith. Considering the fact that people living with HIV/AIDS are already living with a life-threatening ailment, when diagnosed with HIV associated cancers could be quite devastating and depressive.

CBT has been proven to effectively help patients overcome a wide variety (range) of maladaptive behaviours. One of the main focuses of CBT is on changing the automatic negative thoughts that can contribute to emotional difficulties. These negative thoughts spring up spontaneously, and are gradually accepted as true and tend to negatively influence an individual's mood. Through the use of CBT, patients are helped to examine these thoughts and are encouraged to look at evidences from reality that will either support or refute these thoughts. By so doing, patients are able to take a more objective and realistic look at the thoughts that contribute to their feelings by becoming aware of the negative and often unrealistic thoughts that dampen their feelings and moods. Consequent upon this, patients are able to start engaging in healthier thinking patterns which

will, as result, affect or improve and enhance their psychosocial well-being.

A significant number of all studies reviewed indicated effectiveness of cognitive behavioural therapy on patients suffering from one type of cancer or the other. The findings of the studies showed that, there is significant statistical difference between patients who received treatment using cognitive behavioural therapy and those who were not exposed to CBT (Hernandez-Ramirez et al. 2017; Ingrid van der et al. 2017; Jacks & Samuel-Alewa, 2017; Kalter, et al., 2018; Gibbon, et al. 2020; Makama, et al. 2019; Onuoha, et al. 2020; Umesi, 2022; Ayorinde, et al.2020; Onyedibe, Nkechi & Ifeagwazi, 2020; Onyedibe et al. 2020 Ugwuanyi, et al 2020; Phillips, et al. 2022).

1.1 Statement of the Problem

A diagnosis of HIV in a patient itself alone appears to connote doom, and to additionally have a cancer associated to it, spells a bad omen that is capable of generating a heavy psychosocial burden on the patient. Theoretically speaking, HIV/AIDS patients are at increased risk of developing most cancers because of their low immune status which impairs the ability to fight these cancers as they are developing (Akinwande, et al. 2009; American Cancer Society, 2014) and related cases in Nigeria (Kagu et al. 2006; Imade et al. 2008; Dwyer-Lindgren et al. 2017; Yarchoan & Uldrick, 2018). It has been observed over time that patients are only provided with necessary referrals they need to access their medications and some relief materials that are being provided for them, but nothing for them when they are down with opportunistic infections, cancer happens to be one of such, and as a result, some died sooner than expected. So, when they are infected with cancer, they tend to lose fate, hope, and even zeal to live. Patients diagnosed with HIV/AIDS related cancers manifest evidence of weak personal autonomy, low competence, impaired healthy relationship and self-condemnation among other verifiable indices of mental, psychological and social disorder as psychosocial adversity could cause physical disease, that could foster unhealthy behaviour or could lead to neuroendocrine perturbations that influences disease risk. Patients that feel miserable may feel sicker if going through psychosocial issues. It is suspected that the general phenomenon has been underestimated in observational epidemiology, thus part of the association between misery and health could reflect an artifact. Poor psychosocial factors could pause a negative social connotation. These factors may include; abnormal coping skills, denial of symptoms, poor adherence to medical treatment and maladaptive health behaviours which means, the psychosocial well-being that holds such exposures mediates the association between social disadvantage and physical health of which psychosocial intervention is key to improving the health of the disadvantaged. Psychosocial factors, such as: stress, anxiety, depression, social isolation and poor relationship can lead to an increased risk of hypertension, stroke and cardiovascular disease. Major psychosocial issues might include; family problems, substance or alcohol abuse, sexual abuse and violence. These lead to hopelessness, low self-esteem, hostility, negative self-concept and isolation. Mental health and psychosocial support are the kind of support that patients diagnosed with HIV/AIDS associated cancers need to receive in order to promote their mental health and psychosocial well-being which can also mitigate the occurrence of psychiatric and post traumatic stress disorders, as such, the need for this study.

1.2 Aim and Objectives of the Study

The aim of this study is to determine the effects of Cognitive Behavioural Therapy on the Psychosocial Well-being of Patients diagnosed with HIV/AIDS Associated Cancers in Jos University Teaching Hospital, Plateau State, Nigeria. The specific objectives are to:

- determine the effects of CBT on the autonomy of HIV/AIDS patients diagnosed with associated cancers.
- find out the effects of CBT on the environmental mastery competence of HIV/AIDS patients diagnosed with associated cancer.
- examine the effects of CBT on self-acceptance of HIV/AIDS patients diagnosed with associated cancer.
- find out the effects of CBT on personal growth of HIV/AIDS patients diagnosed with associated cancer.
- determine the effects of CBT on purpose in life of HIV/AIDS patients diagnosed with associated cancer.
- determine the effects of CBT in healthy relationship of HIV/AIDS patients diagnosed with associated cancer.

1.3 Research Questions

The following research questions will guide the study:

- What are the effects of CBT on the autonomy of patients diagnosed with HIV/AIDs associated cancers with comparison to experimental and control groups?
- What are the effects of CBT on the environmental mastery competence of patients diagnosed with HIV/AIDS associated cancers on the experimental and control groups?
- What are the effects of CBT on self-acceptance of patients diagnosed with HIV/AIDS associated cancers that were exposed to treatment and those that were not?
- What are the effects of CBT on personal growth of patients diagnosed with HIV/AIDS associated cancers in the experiment and control group?
- What are the effects of CBT on purpose in life of patients diagnosed with HIV/AIDS associated cancers in the experimental and control group?
- What are the effects of CBT on the healthy relationship of patients diagnosed with HIV/AIDS associated cancers in the experimental and control group?

1.4 Hypotheses

The following hypotheses were tested in the study:

- There is no significant mean scores difference between the autonomy of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.
- There is no significant mean scores difference between the environmental mastery competence of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.
- There is no significant mean scores difference between self-acceptance of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.
- There is no significant mean scores difference between the personal growth of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.
- There is no significant mean scores difference between the purpose of life of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.
- There is no significant mean scores difference between the healthy relationship of patients diagnosed with HIV/AIDS associated cancers exposed to treatment and those who were not.

1.5 Scope of the Study

The study was delineated to determine the effects of cognitive behavioural therapy on psychosocial well-being of patients diagnosed with HIV/AIDs associated cancers, in Jos University Teaching Hospital, Nigeria and was also restricted to the effects of cognitive behavioural therapy which is centred on thoughts, Emotions and behaviour of patients that are diagnosed with HIV/AIDS associated cancers in JUTH that are either already on treatment, or awaiting treatment during the time of this study. Only the psychosocial well-being of the patients that falls into the category of the study will be studied. All the six elements of psychosocial well-being will be considered; these are autonomy, environmental mastery and competence, healthy relationship, self-acceptance, personal growth and purpose in life. This study only focus on patients that are diagnosed with HIV/AIDS associated cancers in Jos University Teaching Hospital, these are patients that are either diagnosed with only HIV/AIDs or only cancer will not be considered for the study. Other parts of clients' lives, such as, their type of medication or religion among others will not be captured in this study. Reason for selecting Jos University Teaching Hospital as the study location is because it has a well-established HIV care unit called AIDS Prevention Initiative in Nigeria (APIN). This Centre was established in collaboration with the American Government and is one of the first in the country that provides HIV care to patients from neighboring States like, Bauchi, Kaduna, Gombe, Adamawa, Borno, Yobe, Taraba, Nasarawa and the FCT. It has a high cliental and has operated for more than sixteen years now, making it an appropriate Centre for this study.

2. Theoretical / Conceptual Framework

Cognitive Behavioural Theory (CBT) was propounded by Dr. Aaron T. Beck, born July 18th, 1921 in Providence Rhode Island, U.S.A. The propounder is globally recognized as the father of Cognitive Behavioural Therapy and Cognitive Therapy, which revolutionized the fields of psychology and psychiatry. The theory was propounded in the 1960s, from the Freudian and Behavioural theories that dominated the professions in the 1950s and 1960s. CBT has transformed the

understanding and treatment of a wide range of variety disorders, including; depression, suicidal behaviours, generalized anxiety, panic attacks, Schizophrema, eating disorder and severe mental illness. Cognitive behavioural therapy is based on the cognitive model, which states that thoughts, feelings and behaviours are all connected and that individuals can move toward overcoming difficulties and meeting their goals by identifying and changing unhelpful or inaccurate thinking, problematic behaviour and distressing emotional response. This involves an individual working in collaboration with a therapist to develop skills for testing and modifying beliefs, identifying distorted thinking, relating to others in different positive ways and changing behaviours (Beck, 2011).

A well-coordinated cognitive care conceptualization is developed by the cognitive therapist as a roadmap to understand an individual's internal reality, selection of appropriate interventions and identify areas of distress. If these interventions are well utilized, it may lead to a shift from negative thoughts to positive thoughts. Nicole (2019), expresses that cognitive behavioural therapy is an approach of counselling that has been successfully fought and practiced in many countries. Cognitive behavioural therapy tends to be the preferred therapy employed because it is in fact an umbrella for many different therapies that share some common elements, for instance, Rational Emotive Behaviour Therapy (REBT) developed by Albert Ellis in the 1950s.

Cognitive behavioural therapy is based on the idea that the clients are guided by the therapist to identify their own unhelpful beliefs and then proves them wrong, as a result, their beliefs begin to change for the better. Cognitive behavioural therapy can help an individual to change how he/she thinks (Cognitive) and what he/she does (behaviour) and how these changes in thinking and behaviour can influence their feelings for the better. Cognitive behavioural therapy has been shown to help with many different types of problems, such as physical health problem life pain and fatigue, which is mostly what HIV/AIDs associated cancer patients go through every day of their lives. The achievement of the above involves Assessment, intervention and evaluation (Beltman, Ovade, & Speaker, 2010).

Cognitive therapists helps clients to recognise the negative thought and errors in logic that caused them to be depressed. The thyrapist also guides clients to question and challenge their dysfunctional thoughts, try out new interpretations,and ultimately apply alternative way of thinking in their daily lives. Aaron Beck believes that a person's reaction to specific upsetting thoughts may contribute to abnormality. As we confront the many situations that arise in life, both comfforting and upsetting thought comes to our heads. Beck calls these unbidden cognitive automatic thoughts. When a persons stream of automatic thought is very negative, one would expect a person to become depressed. Beck (1967) identified three mechanisms that he thought were responsible; the cognitive triad (of negative automatic thinking), negative self-schemas and errors in logic (that is, faulty information processing). The cognitive triads are the tree forms of negative (that helps and critical) thinking that are typical of individual with depression: negative thoughts about the self, the world and the future. These thoughts tend to be automatic in depressed people as they occur spontaneously.

As these three components interacts, they interfere with normal cognitive processing, leading to impairment in perception, memory and problem solving with the person becoming obsessed with negative thought.

3. Research Methodology

This section describes the method and procedure to be used in carrying out this study and is discussed under the following sub-headings; research design, population and sample, sampling technique, instruments for data collection, validity and reliability of instruments and method of data analysis.

3.1 Research Design

True experimental design was suitable for this study because the research contains the three key features that the design requires which are independent and depended variables, pretesting and post-testing, and experiment and control group, it is a statistical approach to establishing a cause-and-effect relationship between different variables. It involves comparing the effects of a given treatment with other treatments or no treatment at all and allows the researcher to draw causal inference and observe the effects of an independent variable (CBT) on the psychosocial wellbeing (which is the dependent variable) of patients diagnosed with HIV/AIDS associated cancers in Jos University Teaching Hospital, Plateau State. The experimental group were exposed to Cognitive Behavioural Therapy (CBT) package while the control group were exposed to personal hygiene packages. .

Group	pretest	treatment	Post-test
Experimental	O^1	X	O^2

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Control O^3 O^4

Illustration of the non-equivalent pre-test-posttest design

Where:

O^1 = pretest for experimental group
O^2 = posttest for experimental group
O^3 = pretest for control group
O^4 = posttest for control group
X = treatment for experimental group

-------- = blank between 03 and 04 stands for no treatment for the control group

3.2 Population and Sample

3.2.1 Population

In research, population is conceived as known and well-defined collection of individuals or objects of interest with similar characteristics or traits that a researcher intends to obtain information and draw conclusions about. Therefore, a member of the target population must have some specific things or features in common with the rest of the members of the targeted population and those features must conform to some designated set of guidelines and specifications of the intended research. Accordingly, the target statistical population for this study will consist of two hundred (200) HIV/AID associated cancer patients diagnosed during the period of conducting this research in Jos University Teaching Hospital. The choice of Jos University Teaching Hospital is as result it being among the first institution to give antiretrovirals to HIV/AIDS patients in the region and it has established a large cliental.

3.2.2 Sample

A sample is perceived as a portion or part of a research population that is selected to be studied based on specific guiding principles that are required by the researcher, (Awotunde & Ugodulunwa, 2004). A sample is therefore a group of people that took part in an investigation. The function of a sample is to guide or allow a researcher conduct a study using individuals or objects from a particular population so that the result of the study can be used to make a generalized conclusion on that particular population. Therefore, the sample size for this study will only be determined in field became the researcher does not know the number of patients with HIV/AIDS associated cancers that will be willing and ready to volunteer themselves for the study.

3.3 Sampling Technique

Purposive or judgmental sampling technique was used in selecting the sample for this study. Purposive sampling is a sampling technique in which the researcher attempts to select a sample that appears as being representative of the population defined by the research problem. The researcher selected patients with HIV/AIDS related cancers with the assistance of the Doctor that attends to them during their clinical follow-ups. Patients were selected according to their clinical days purposively, the reason for choosing the patients' clinical days is to guard against interaction between the two groups.

3.4 Instrument for Data Collection

The adapted instrument to be used for data collection for the study is called Ryff's Psychosocial wellbeing scales (PWB) 42 items version. The research instrument that will be used to identify the effect of cognitive behavioural therapy on the psychosocial well-being of patients with HIV/AIDS associated cancers is Ryff's Psychosocial Well-being scale (PWB). This instrument is designed to provide an indebt self-report and insight guide information that will be used for evaluating the effectiveness of the treatment on these patients. The Psychosocial Well-Being Scale Questionnaire consists of fourty two (42) items. This instrument is designed to provide a brief, self-report and insight guide information that will be used for evaluating the effectiveness of the treatment. Furthermore, the PWB is adapted and rated on a scale of 1-4 where 1=strongly agree, 2= little agree, 3= little disagree, and 4=strongly disagree. The scale is divided into six in other to address all the six variables of psychosocial well-being and the scoring goes thus:

The autonomy subscale items are Q1, to Q7,
The environmental mastery subscale items are, Q8-Q14.
The personal growth subscale items are Q15 to Q21
The healthy relationship subscales item are Q22 to Q28.
The purpose in life subscale items are Q29, to Q35,

The face and content validity of the instruments was sought through experts' judgment was found to be 0.83 which shows that the instrument is valid and the reliability of the PWB was established using Cronbach Alpha method of estimating the reliability of instrument and a reliability coefficient of 0.834 was computed which shows that corrupted, which shows that the instrument is reliable.

3.5 Method of Data Analysis

Data collected was analyzed using statistical package for social sciences (SPSS 25). Data will be subjected to both descriptive statistics to answer the research questions and inferential statistics to test the hypotheses. The research questions were tested using the frequencies, means and standard deviations to show the difference among the different groups (pretest and posttest for both control and treatment group). The research hypotheses were tested using t-test repeated measures test to show if the difference among the treatment and control groups are significant for each hypothesis tested.

3.6 Procedure for Data Collection

The researcher obtained a letter of introduction and ethical clearance from the head of department, Educational Foundations, University of Jos, which was presented to the ethical committee of the Plateau state specialist hospital, Plateau State, for permission to conduct a research on patients diagnosed with HIV/AIDS associated cancers in the hospital. After obtaining the permission, the researcher requested for the assistance of the consultants in Oncology unit that helped with the notification or identification of patients that are diagnosed with HIV/AIDS associated cancers, and to also help in introducing the researcher to the patients for the purpose of the study. By so doing, a report was established for easy flow of communication between the researcher and the patients. After the introductions, the researcher and the clients discussed and agreed on time, venue (space) and dates which the sessions were carried out.

4. Results

Research Question One: What is the pretest and posttest autonomy mean scores of the experimental and control group?

Table 1: The Results of the Pretest and Posttest Autonomy Scores of the Experimental and Control groups

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	17.52	6.14		
					10.25	
	Posttest	21	27.77	6.13		
						2.66
Control	Pretest	18	17.16	5.60		
					7.59	
	Posttest	18	24.75	5.60		

The results of the analysis from table 1 reveals that the experimental group has a pretest mean scores of $\bar{x}$17.52, SD 6.14 and posttest mean scores of $\bar{x}$27.77 and SD 6.13 with mean gain of 10.25 while the control group had pretest mean scores of $\bar{x}$17.16, SD = 5.60 and a posttest mean score of $\bar{x}$24.75, SD = 5.50 with mean gain 7.59. The result further reveals a mean difference between the experimental and control group of 2.66 in favour of the experimental group. This indicates that cognitive behavioural therapy improves the psychosocial well-being of patients with associated cancers.

Research Question Two: What is the pretest and posttest environmental mastery competency mean scores of the experimental and control group?

Table 2: The Results of the Pretest and Posttest Environmental Mastery Competence Mean of the Experimental and the Control Group.

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	19.52	6.22		
					10.36	
	Posttest	21	29.88	6.32		1.06
Control	Pretest	18	15.77	5.65		
					9.27	
	Posttest	18	25.04	5.59		

The results of the analysis from table 2 reveals that the experimental group has a pretest mean scores of $\bar{x}$19.52, SD 6.22 and posttest mean score of $\bar{x}$29.88, SD 6.32 with mean gain of 10.36. While the control group had a pretest $\bar{x}$15.77, SD = 5.65 and a posttest mean score of $\bar{x}$25.04, SD = 5.59 with mean gain of $\bar{x}$9.27. The result indicates a mean difference ($\bar{x}$dd) of 1.06 between the experimental and control groups. This implies that CBT improves the environmental mastery competency mean scores of HIV/AIDs patient diagnosed with associated cancers.

Research Question Three: What is the pretest and posttest personal growth mean scores of HIV/AIDs patients diagnosed with associated cancer between the experimental and control group?

Table 3: Results of the Pretest and Posttest Self Acceptance Mean Scores of the Experimental and Control Groups

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	18.80	6.00		
					8.03	
	Posttest	21	26.83	5.64		
						1.06
Control	Pretest	18	18.83	5.75		
					6.67	
	Posttest	18	25.80	5.57		

The results of the analysis from table 3 reveals that the experimental group has a pretest mean scores of $\bar{x}$18.80, SD 6.00 and posttest mean score of $\bar{x}$26.83, SD 5.04 with mean gain of $\bar{x}$8.03 while the control group had a pretest mean scores of $\bar{x}$18.83, SD = 5.75 and a posttest mean score of $\bar{x}$25.80, SD = 5.57 with mean gain 6.97. The result indicates a mean difference $\bar{x}$ −dd of 1.06. This implies that Cognitive Behavior Therapy improves the personal growth of HIV/AIDs patient diagnosed with associated cancers.

Research Question Four: What is the Pretest and Posttest self-acceptance mean scores of HIV/AIDs patients diagnosed with associated cancer in the experimental and control group in Plateau Specialist Hospital.

Table 4: Results of the Pretest and Posttest Personal Growth Mean Scores of the Experimental and Control Groups

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	16.52	5.92		
					13.70	
	Posttest	21	30.22	5.23		
						5.48
Control	Pretest	18	15.11	6.10		
					8.22	
	Posttest	18	23.33	5.60		

The results of the analysis from table 4 reveals that the experimental group had a pretest mean scores of $\bar{x}$16.52, SD = 5.92 and a posttest mean score of $\bar{x}$30.22, SD 5.23 with mean gain difference of $\bar{x}$ 13.70 while the control group had a pretest mean scores of $\bar{x}$15.11, SD = 6.10 and a posttest mean score of $\bar{x}$23.33, SD = 5.60 with mean gain 8.22. The result indicates that a mean difference between the two groups of $\bar{x}$ −diff 5.48. This implies that Cognitive Behavior Therapy improves the self-acceptance mean scores of HIV/AIDs patients with associated cancers in Plateau Specialist Hospital.

Research Question Five: What is the pretests and posttest purpose in life mean scores of HIV/AIDs patients diagnosed with associated cancer between the experimental and control group?

Table 5: The results of the Pretest and Posttest Purpose in Life Mean Scores of the Experimental and Control Groups

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	18.04	5.57		
					8.34	
	Posttest	21	26.38	5.08		
						6.45
Control	Pretest	18	22.11	8.56		
					1.89	
	Posttest	18	24.00	5.49		

The results of the analysis from table 5 showed that the experimental group has a pretest mean scores of $\bar{x}$18.04, SD = 5.57 and posttest mean score of $\bar{x}$26.38, SD = 5.08 with mean gain of $\bar{x}$8.34 while the control group had a pretest mean scores of $\bar{x}$22.11, SD = 8.56 and a posttest mean score of $\bar{x}$24.00, SD = 5.49 with mean gain of $\bar{x}$ 1.89. The result further indicates that mean difference between the experimental and control group of $\bar{x}$ −diff of 6.45. This implies that Cognitive Behavior Therapy improves the purpose in life mean scores of HIV/AIDs patients with associated cancers in Plateau Specialist Hospital.

Research Question Six: What is the pretest and posttest healthy relation mean scores of HIV/AIDs patients diagnosed with associated cancer in the experimental and control groups Plateau Specialist Hospital?

Table 6: Results of the Pretest and Posttest Healthy Relationship Mean Scores of the Experimental and Control Groups

Group		N	$\bar{x}$	SD	Mean gain	$\bar{x}$-diff.
Experimental	Pretest	21	17.80	8.38		
					8.75	
	Posttest	21	26.55	6.54		
						1.77
Control	Pretest	18	16.16	6.27		
					6.98	
	Posttest	18	23.19	5.11		

The results of the analysis from table 6 shows that the experimental group had a pretest mean scores of $\bar{x}$17.80, SD = 8.38 and posttest mean score of $\bar{x}$26.55, SD 6.54 with a mean gain of $\bar{x}$8.75 while the control group had a pretest mean scores of $\bar{x}$16.16, SD = 6.27 and a posttest mean score of $\bar{x}$23.19, SD = 5.11 with mean gain 6.98. The result indicates a mean difference $\bar{x}$ −diff between the experimental and control group after treatment of $\bar{x}$diff of 1.77. The implies that Cognitive Behavior Therapy improves the healthy relationship mean scores of experimental group more than that of the control group.

Hypothesis Testing

Hypothesis One: There is no significant difference in the posttest autonomy mean difference of HIV/AIDS patient diagnosed with associated cancers between the experimental and control groups in Plateau Specialist Hospital.

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Table 7: Results, of the t-test Analysis on the Posttest Autonomy Mean Scores between the Experimental and Control Groups.

Group	N	$\bar{x}$	SD	Df	t	p-value	Decision
Experimental	21	27.77	6.13				
				37	2.60	0.019	Significant
Control	18	24.75	5.60				

The results of the analysis of the posttest Autonomy mean scores of HIV/AIDs patients diagnosed with associated cancer between the experimental and control groups. In the experimental the posttest autonomy mean scores is 27.77, SD = 6.13 where the control group had a mean scores 24.75, SD = 5.60. The result also shows t(37) = 2.60, p< 0.05. Since the p-value of 0.019 is less than the 0.05 level of significance, the null hypothesis was rejected. This implies that there is a significant difference between the posttest autonomy mean score of HIV/AIDs patients diagnosed with associated cancer in the experiential and control groups. Hence Cognitive Behavior Therapy improves autonomy of HIV/AIDs patients diagnosed with associated cancers in Plateau Specialist Hospital.

Hypothesis Two: There is no significant difference in the posttest environmental mastery competence mean scores of HIV/AIDs patient diagnosed with associated cancers between the experimental and control groups.

Table 8: The results of the t-test Analysis on the Posttest Environmental competence Mean Scores between the Experimental and Control Groups.

Group	N		SD	Df	T	p-value	Decision
Experimental	21	29.88	6.22				
				37	2.38	0.029	Significant
Control	18	25.04	5.59				

The result of the t-test analysis from table 8 shows that the experimental group had a posttest mean scores of $\bar{x}$29.88, SD = 6.22 while the control group has a posttest mean scores of $\bar{x}$25.04, SD = 5.59. The results indicates that t(37) = 2.38, p < 0.05. Since the p-value of 0.029 is less than 0.05 level of significance, the null hypothesis is rejected. Hence there is a significant difference in the environmental mastery competence mean score between the experimental and control group. This implies that Cognitive Behavior Therapy improves the environmental mastery means scores of HIV/AIDs patients diagnosed with associated cancers in Plateau Specialist Hospital.

Hypothesis Three: There is no significant difference in the posttest Personal Growth mean scores of HIV/AIDs patient with associated cancers between the experimental and control groups.

Table 9: Results of the t-test Analysis on the Posttest Personal Growth Mean Scores between the Experimental and Control Groups.

Group	N		SD	Df	T	p-value	Decision
Experimental	21	26.83	5.64				
				37	0.84	0.413	in Significant
Control	18	25.80	5.57				

The result of the t-test analysis from table 9 reveals that the experimental group had a posttest Personal Growth mean scores of $\bar{x}$26.83 and standard deviation 5.64 while the control group has a posttest mean scores of $\bar{x}$25.80 and standard deviation 5.57. The results indicate that t(37) = 0.84, p < 0.05. Since the p-value of 0.413 is greater than the significant level of 0.05 the null hypothesis is accepted. Therefore, there is no significant difference in posttest Personal Growth mean scores between the experimental and control group. This implies that Cognitive Behavior Therapy does not improve the personal growth mean scores of HIV/AIDs patients diagnosed with associated cancer in Plateau Specialist Hospital.

Hypothesis Four: There is no significant difference between in the Posttest Positive Relation mean scores of HIV/AIDs patient with associated cancers between the experimental and control groups in JUTH.

Table 10: Results of the t-test Analysis on the Posttest Positive Relation Mean Scores of HIV/AIDs Patients diagnosed with associated cancers between the Experimental and Control Groups.

Group	N		SD	Df	T	p-value	Decision
Experimental	21	26.55	6.54				
				37	2.12	0.001	Significant
Control	18	25.19	5.11				

The result of the t-test analysis from table 10 shows that the experimental group had a posttest Positive Relation mean scores of $\bar{x}$26.55, SD = 6.54 while the control group had $\bar{x}$23.19, SD = 5.11. The results also indicate that t(37) = 2.12, p< 0.05. Since the p-value of 0.001 is less than significant level of 0.05, the null hypothesis is rejected. Therefore, there is a significant difference in posttest mean scores of HIV/AIDs patients diagnosed with associated cancer between the experimental and control group. This implies that Cognitive Behavior Therapy improves HIV/AID patients diagnosed with associated cancers in Positive Relation in Plateau Specialist Hospital.

Hypothesis Five: There is no significant difference in the Posttest Purpose in Life mean scores of HIV/AIDs patient diagnosed with associated cancers between the experimental and control groups in Plateau Specialist Hospital.

Table 11: Results of the t-test Analysis on the Posttest purpose in Life Mean Scores of HIV/AIDs Patients diagnosed with associated cancers between the Experimental and Control Groups.

Group	N		SD	Df	T	p-value	Decision
Experimental	21	26.38	5.08				
				37	1.81	0.001	Significant
Control	18	24.00	5.49				

The result of the t-test analysis from table 12 indicates that the experimental group had a posttest mean scores of $\bar{x}$26.38, SD, = 5.08 while the control group has $\bar{x}$24.00, SD = 5.49. The results indicate that t(37) = 1.81, p< 0.05 since the p-value of 0.001 is less >0.05, the null hypothesis is rejected. Therefore, there is a significant difference in the purpose in life mean scores of HIV/AID patients diagnosed with associated cancers between the experimental

and control group. This implies that Cognitive Behavior Therapy helps the posttest mean scores of HIV/AID patients diagnosed with associated cancers in Plateau Specialist Hospital.

Hypothesis Six: There is no significant difference in the Posttest Self-Acceptance mean scores of HIV/AIDs patient with associated cancers between the experimental and control groups in Plateau Specialist Hospital.

Table 12: Results of the t-test Analysis on the Posttest Self-Acceptance Mean Scores of HIV/AIDs Patients diagnosed with associated cancers between the Experimental and Control Groups.

Group	N		SD	Df	T	p-value	Decision
Experimental	21	30.22	5.23				
				37	4.82	0.001	Significant
Control	18	23.33	5.60				

The result of the t-test analysis from table 12 shows that the experimental group had a posttest self-acceptance mean scores of 30.22, standard deviation 5.23 while the control group had a posttest mean scores of 23.33, standard deviation of 5.60. The results indicate that $t(37) = 4.82$, $p < 0.05$. Since the p-value of 0.001 is less than 0.05, the null hypothesis is rejected. Therefore, there is a significant difference in the posttest self-acceptance mean scores between the experimental and control group. Hence Cognitive Behavior Therapy help to improve the mean scores of HIV/AID patients diagnosed with associated cancers in Plateau Specialist Hospital.

5. Discussion on the findings

The study investigated the effects of Cognitive Behavioural Therapy on the Psychosocial Well-being of Patients diagnosed with HIV/AIDS Associated Cancers in Jos University Teaching Hospital, Plateau State, Nigeria. Six dimensions of the psychological wellbeing were considered including autonomy, environmental mastery, personal growth, positive relation, purpose in life, and self-acceptance. The six objectives and hypotheses were developed in line with the six dimensions and the findings shows that interventions applied in the experimental group groups was effective as patients level of psychological functioning at each dimension of the psychological functioning improved.

The findings were consistent with the works of other researchers who found that cognitive behavioral therapy as an intervention are effective in improving psychological functioning of patients suffering different conditions (Gibbon, et al. 2020; Makama, et al. 2019; Onuoha, et al. 2020; Umesi, 2022; Ayorinde, et al.2020; Onyedibe, Nkechi & Ifeagwazi, 2020).

Designing interventions that targets the faulty thinking patterns of the patients who are experiencing terminal illnesses such as HIV/AIDS Associated Cancers are crucial. One's way of thinking can either improve or cause further havoc to the patients condition. The connection between the mind and the body has been established and appears to be inseparable, as such, the need for patients of HIV/AIDS Associated Cancers have health minds or psychological wellbeing which helps in the healing process and ensures their longevity and wellness while managing the condition.

6. Conclusions

CBT is an effective treatment for improving the Psychosocial Well-being of Patients diagnosed with HIV/AIDS Associated Cancers, as in this study, we have found that CBT has a potential improvement effect on all the six dimensions of autonomy, environmental mastery, personal growth, positive relation, purpose in life, and self-acceptance. In conclusion, Cognitive Behavioral Therapies has been shown to be efficacious by several researchers as confirmed by this study especially for the unique population of HIV/AIDs associated cancer patients and it is therefore highly recommended that the treatment of HIV/AIDs associated cancer patients should incorporate the services of mental health practitioners with skills in CBT.

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