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Effectiveness of Acceptance and Commitment Therapy (ACT) for Depression in Patients with Advanced Cancer: A Case of Nairobi Hospice, Kenya

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ABSTRACT

Despite existing interventions, depression remains a significant concern for patients with advanced cancer. The aim of this study was to investigate the effectiveness of ACT in treating depression among this population at Nairobi Hospice in Kenya. Sixty patients with advanced cancer were randomly assigned to either the intervention group (ACT) (n = 30) or the control group (n = 30). The primary outcome was depression, measured using the Beck Depression Inventory-II (BDI-II) at baseline and post-intervention. Additionally, psychological flexibility was assessed using the Acceptance and Action Questionnaire II (AAQ-II) in the intervention group only. The intervention consisted of 5 ACT sessions. The study revealed a statistically significant reduction in depression scores over time among participants who received ACT compared to the control group. Furthermore, ACT significantly increased psychological flexibility within the intervention group. This study suggests that ACT is a promising alternative intervention for managing depression in patients with advanced cancer. This finding highlights the potential of ACT to address both depression symptoms and psychological inflexibility, which can contribute to reduction in depression in this population.

Key words: **depression, advanced cancer, ACT, psychological flexibility, hospice.**

1. INTRODUCTION

Cancer can be seen as a disease which is described as the unusual multiplication of DNA (deoxyribonucleic acid) (Weru et al., 2020). Those who experience advanced cancer go through more severe symptoms as well as psychological distress (Economos et al., 2020). The depression that is associated with advanced cancer was what this study set out to address with ACT as an intervention. In cancer settings, according to Yang et al. (2019), studies have shown that depression comes with low participation in treatment on the part of the patients. The mood disorder which is associated with depressive symptoms has also been discovered to be common among patients with advanced cancer (Gold et al., 2020). The present study therefore focused on contributing to a reduction of the depressive symptoms in patients with advanced cancer. The study achieved this with ACT as an intervention. Acceptance and commitment therapy came into limelight through the psychologist, Steven Hayes (Hayes, 2016). According to Feros et al. (2011), ACT as an intervention concentrates and focuses on changing the interaction people have with their thoughts instead of trying to change the content that exists in these thoughts. The theory of ACT, holds that psychopathology occurs as a result of lack of psychological flexibility (PF), which also results from experiential avoidance (EA) (Ledari et al., 2018).

2. LITERATURE REVIEW

One of the ways of checking the effectiveness of a psychological intervention is by embarking on a literature review of studies that have been conducted with the intervention. This was also done in the case of ACT, to determine the general view of its effectiveness. Mathew et al. (2021) conducted a systematic review in America which critically evaluated the impact of ACT on cancer as well as the psychological distress that comes with it, especially depression. The review indicated that ACT significantly reduced depression and improved psychological flexibility in the participants.

ACT aims to promote greater psychological flexibility (Watson & Howell, 2023). To show the consistency of ACT with psychological flexibility, a review of some literatures on the intervention of ACT was conducted in London (Stockton et al., 2019). The study was conducted as a way of updating

and extending the ACT mediation evidence base through a review of mediation studies published since Hayes publication was reviewed. This was done by systematically collating, synthesizing, and assessing the quality of mediation studies that were published from 2006 to 2015. The eligibility criteria accommodated twelve studies. The result revealed that the results of mediation were seen to be highly consistent with the psychological flexibility model of ACT.

A good number of therapeutic methods have been developed and employed to address series of psychosocial distress and stressors which result from cancer diagnosis, with ACT being one of these approaches. Fashler et al. (2018), conducted a review in Canada to establish a theoretical rationale for adopting ACT as a therapy in psychosocial oncology care, where the reduction of emotional distress is a priority. In the review, the eligibility criteria accommodated six studies. The cancer cases considered were those of breast, ovarian, colorectal, and mixed cancer population which are at various stages of disease progression or recovery. According to these researchers, ACT interventions showed a great deal of significant improvements in symptoms including psychological flexibility as well as reductions in depressive symptoms. This indicates that ACT is an effective psychotherapeutic approach for cancer patients.

The efficacy of ACT can be viewed as assessed and validated in a series of randomized controlled researches with an enormous capacity of conditions that are targeted. This assertion gave rise to a review of some studies in Switzerland (Gloster et al., 2020). In the review, a total number of 20 mate-analysis reported 100 controlled effect sizes across 12,477 participants. These effect sizes were subsequently grouped together by comparison groups and target conditions. The study revealed the fact that ACT was effective in treating every psychological condition encountered.

The efficacy of ACT can further be seen in a study conducted to prove its usefulness in oncology treatment as well as the accompanying psychological distress, like depression. The research was conducted with the aim of analyzing published studies regarding the effectiveness of ACT in treating oncological patients in Spain (González-Fernández , 2019). There was a systematic review of selected literature where the Web of Science, Google Scholar, and Dialnet were consulted (200-2016). The review revealed that participants who got ACT intervention exhibited greater psychological flexibility, improved quality of life, as well as better emotional state. The study also revealed that ACT proved to be verry effective in treating the psychological need of cancer patients.

It has been observed that the need for a psychological intervention arises from the moment diagnosis is communicated to cancer patients. This is as a result of the fact that psychological distress such as depression begins from the moment diagnosis is communicated to patients (Kim et al., 2023). There is also the challenge of how patients manage their psychological distress during psychological interventions. To evaluate this challenge, a study was conducted in India to assess how patients manage their distress during psychological and clinical interventions (Datta et al., 2016). The outcome of the study indicated that ACT has the power to be effective as an intervention for patients of cancer, because it helped the patients accept and manage their distress very well during the intervention due to the achievement of psychological flexibility.

The present study checked the effectiveness of ACT in reducing the depression score in patients with advanced cancer. As a psychological intervention, ACT achieves psychological flexibility in patients with advanced cancer with depressive symptoms by reducing their depressive scores. The capacity of ACT to achieve this was validated in a study conducted in China to check how effective ACT is on depression (Bai et al., 2020). The investigation established the fact that ACT reduced the depression score of the treatment group significantly, as opposed to participants in the control group. The researchers of this study also made it known that the result of the study revealed that ACT was very effective in reducing the symptoms of depression.

Subsequently, there was a study conducted in China to check how effective ACT is with mentally ill cancer patients (Li et al., 2021). Publications up to July 25, 2020 were searched from ten databases, with the help of a combination of search terms that are mental health related, as well as cancer, and those of randomized control trials. The literatures went through the screening of two independent researchers. The research showed that ACT was significantly associated with improved outcomes after the administration of the treatment for depression. The study also revealed that ACT had a strong association with psychological flexibility, which demonstrated that ACT has the capacity to be an important part of cancer care.

The sampling method in each study significantly influences the result of the study. In the present study, purposive sampling was one of the sampling methods employed. There was also a treatment group and a control group. A study in Iran examined the use of purposive sampling in a study which used the intervention of ACT on depression among cancer patients, to check the efficacy of ACT. The focus of the study was to assess the effect of ACT on depression, psychological flexibility, as well as pain acceptance among married women who suffer from breast cancer (Ghorbani et al., 2021). The study recruited 40 women with purposive sampling method, who were subsequently randomized into two groups of 20 each in both the intervention and the control groups. Acceptance and Action Questionnaire – II (AAQ-II) was used in checking for psychological flexibility. The study showed that the treatment of ACT reduced the mean depression score significantly ($p < 0.001$), as opposed to the control group. Additionally, psychological flexibility ($p < 0.05$) also increased significantly as opposed to that of the control group. The result of the study indicated that ACT is an effective therapeutic intervention in increasing pain acceptance and psychological flexibility, as well as reducing depression scores among women with breast cancer.

To assess the efficacy of ACT, using a quasi-experimental research design, a study was conducted in Iran to check the effectiveness of ACT on depression in the elderly with nonclinical depression (Golestanifar & DashtBozorgi, 2020). The study used purposive sampling method, and the participants were assigned to treatment and control groups. The treatment group received 10 sessions of ACT, while those of the control group did not receive the ACT intervention. The experiment revealed that ACT helped in reducing the depressive symptoms, as well as an improvement in psychological health of the participants. In addition, a study in Iran conducted by Farokhzadian et al. (2020) to check how effective ACT is in reducing depressive symptoms in patients of cancer, in a semi-experimental study, also revealed that ACT is very effective in reducing depressive symptoms in the patients.

There are limited studies in Africa on ACT as an intervention on depression in cancer patients. Also, there seems to be no known published study in Kenya about ACT on depression among patients with advanced cancer. This can be seen as one of the gaps the study tried to fill, with the use of ACT as an intervention on depression in patients with advanced cancer in Nairobi Hospice, Kenya. However, in Africa there was a review of literature which aimed to assess the need for the use of ACT by health extension workers as an intervention in addressing mental health care issues across Ethiopia (Geda et al., 2021). The authors of this study did a review of studies which assessed the effectiveness of ACT-based treatments in African countries with special focus on Nigeria, Sierra Leon, Uganda, as well as South Africa. The result of the study showed that all the studies revealed a significant improvement of various mental health-related outcome measures, such as significant decrease in psychological distress, as well as symptoms of depression in treatment group.

3. THEORETICAL FRAMEWORK: RELATIONAL FRAME THEORY (RFT) AND PSYCHOANALYTIC TRHEORY

RFT was developed by Steven Hayes, a clinical psychologist, and professor of the University of Navada's Behavior Analysis program (Ackerman, 2023). He developed it to help explain human cognition and language. RFT is a recent theory that has to do with how language and cognition affect behavior and this was first coined as a concept in 1985 (Dymond et al., 2010). The main connection between RFT and ACT is that the emergence of the human language, which is seen as a derived relational response, possesses the capacity to create psychological distress (McEnteggart, 2018). RFT basically operates on how language helps us interact with a situation or feeling based on the notion we have of the situation or thing. This interaction can be positive or negative in nature. One may decide to associate with an event, place, or feeling based on what one has heard about the event, place, or feeling, and not necessarily that one has experienced it before (Prevedini et al., 2011). One can also avoid an event, place, or feeling based on what one has heard about the event, place, or feeling. Language can be seen to be synonymous with what has been heard (Hussey et al., 2015). The avoidance of something based on the meaning one associates with it is known as experiential avoidance (Dawson & Golijani-Moghaddam, 2020). When experiential avoidance is at work, psychological inflexibility takes place, whereby one is not able to negotiate a given event. The function of ACT is therefore to help achieve psychological flexibility, by challenging or eliminating experiential avoidance.

Freud's psychoanalytic theory gave rise to his concept of grief work (Nielsen et al., 2016). According to Kusevic et al. (2020) Freud's 1917 work on Mourning and Melancholia, which is the original work on depression, gave a strong psychoanalytic base to the explanation of depression. This work referred to Mourning as normal grief, and Melancholia as pathological grief (Rhee, 2017). From a psychoanalytic point of view, depression can be seen as an unconscious psychic effort employed to deal with an emotional pain as a result of a traumatic experience (Leuzinger-Bohleber, 2015). Freud in his theory of depression, described depression as aggression that is directed inward, that is towards oneself (Haddad et al., 2008). According to Ribeiro et al. (2017), mourning refers to the loss of a loved one or object that can easily be overcome, but melancholia refers to the prolonged pathological effect of the loss of a loved one or an object, which is described as depression. This loss, which could be of death or relationship, usually evokes the feeling of being slighted, neglected, or disappointed (Desmet, 2013). The melancholia or depression described by Freud could also take place before the loss in the form of anticipatory grief.

Grief as a phenomenon was first studied by American psychiatrist Eric Lindemann in the 1940s, with the term Anticipatory Grief (AG) (Testoni et al., 2020).

Lindeman situated his concept of grief within the psychoanalytic theory of Freud (Holm et al., 2019). AG was initially introduced by Lindeman in the context of the Second World War, as it was observed that relatives of soldiers experienced the stages of grief (Plant, 2022). Lindeman gave a description of how mothers and children of soldiers grieved in anticipation of these soldiers during the period of the second world war (Bilić et al., 2022). Lindemann noted that a grief of this nature has the capacity to reduce the effect of any death that may be seen as sudden, and therefore reducing the effect of the grief that comes after the actual loss. According to Plant (2022), in several of these instances, a good number of soldiers who decided to surprise their families with their return ended up meeting with requests of divorce, and not grief or even joy. Lindemann attributed this to the fact that a good number of these women had already grieved their husbands when in fact they did not die.

Since this melancholia or depression can take place before or after the loss, it also mean that in cancer and advanced cancer settings it can take place before or after the death of the cancer patient. Even when it takes place before the death of the advanced cancer patient, there are already accounts of various losses, like the loss of sound health, loss of job, loss of relationships, loss of social life, and a host of other losses. Cancer patients who are diagnosed with the disease often find it stressful and uncomfortable, which put a whole level of burden on the patients and their caregivers (Seyedfatemi et al., 2021). When cancer develops, patients become weak both at the physical level and the psychological level. When diagnosis is communicated to loved ones, it is always traumatizing and it represents the stage where grief begins in anticipation (Rogalla, 2020). Added to the communication of diagnosis, the experiences of the functional decline of patients, and changes in their roles and identities, have been identified as risk factors of AG in patients and caregivers (Hsiao et al., 2022).

As a result of the fact that this depression or melancholia lingers more than the mourning or ordinary grief, it means that it defies the capacity of patients with advanced cancer or cancer patients in general to get over it. This then requires the help of professionals in terms of therapy. ACT is one therapeutic approach among others in this context. One of the empirically proven interventions available for assisting patients with advanced cancer who present with depressive symptoms is ACT. This can be seen in a study conducted in Scotland, to explore the effectiveness of ACT for people with palliative care needs (Gibson-Watt et al., 2022). According to these researchers, the result of the study revealed that ACT has the capacity to reduce depression score in people with advanced progressive illness.

4. METHODOLOGY

The study employed quantitative research design where it used the quasi-experimental research design. At the baseline, the participants were assessed for severity of depression. The experimental group was administered the ACT intervention for 5 weeks. The control group only received their routine cancer management. A midline assessment was done after the 5 weeks intervention. This was repeated at the endline, which was 3 weeks after the completion of the treatment. The experimental group was also assessed for psychological flexibility at baseline, midline and at endline. The sample size for the present study was derived from the average number of patients with advanced cancer in NH. The number of patients with advanced cancer seen in the year 2023 are shown in Table 1

Table 1: Number of Patients with advanced cancer at Nairobi Hospice from January to April 2023

Month	**January**	**February**	**March**	**April**	**Total**	**Average**
Number of patients	72	58	73	65	268	67

Table 1 shows that the average number of patients seen at NH from January to April 2023 was 67. With a target population of 67 patients with advanced cancer in NH, the population of those with depression, based on a study by Mushtaq et al. (2017), was estimated at 80% of 67, which gives 53.6. Thus, the target population (N) of those with depression at NH was approximated at 54. Attrition of 25%, which is 12, was added to the sample size, which brought the total sample size to 60. From the sample size, and randomizing the participants into equal proportions, 30 participants were assigned to the experimental group and 30 were assigned to the control group.

5 RESULTS

5.1 Randomization Test And Characteristics Of The Sample

Baseline differences between the groups were analyzed using Pearson chi-square test for categorical variables and independent sample T-tests for continuous variables. Table 2 shows that there were no significant between-group (Experimental vs Control) differences on socio-demographics, as shown by the p-values. Similarly, the results show that groups did not differ significantly in terms of the main primary outcome measure (BDI-II) and process measure (AAQ) at baseline. This implies that randomization of participants into groups worked and that there was no selection bias in either group, and further confirms that at baseline, the experimental and control groups were similar. This in effect means that in the absence of any spillover effects during the intervention, we can indeed attribute any observed changes to the intervention.

Table 2 : Summary Statistics at Baseline by Experimental and Control Group

	Experimental		**Control**		**Diff**	**p-value**
Measures	**N**	**Mean (SD)**	**N**	**Mean (SD)**		
Age in years	30	48.30 (7.53)	30	51 (9.77)	-2.7	0.24
Sex (Male) (%)	30	0.10	30	0.10	0.00	1.00
Marital Status						
Single (%)	30	0.40	30	0.23	0.17	0.17
Married (%)	30	0.37	30	0.40	-0.03	0.79
Separated (%)	30	0.07	30	0.20	-0.13	0.13
Widow (%)	30	0.17	30	0.17	0.00	1.00
Religion						
Catholic (%)	30	0.30	30	0.20	0.10	0.38
Protestant (%)	30	0.50	30	0.67	-0.17	0.20
Muslim	30	0.03	30	0.07	-0.03	0.56
SDA	30	0.07	30	0.00	0.07	0.16
Others	30	0.10	30	0.07	0.03	0.65
Education (in years)	30	11.1 (2.20)	30	10.1 (3.04)	1	0.15

Time since first diagnosis						
> 1 month & <6 months (%)	30	0.03	30	0.03	0.00	1
> 6 months & < 1year (%)	30	0.17	30	0.17	0.00	1
> 1year (%)	30	0.80	30	0.80	0.00	1
Outcome						
BDI-II	30	25.1 (8.07)	30	22.5 (6.95)	2.6	0.10
Process						
AAQ	30	37.93 (9.62)	-	-	-	-

As shown in Table 2, a total of 60 participants (patients) were included in the study, with 30 being randomly assigned to the Experimental group and the remaining 30 being assigned to the control group. In the total sample, the mean age was 49.65 years with the mean age of 48 (SD 7.53) in the experimental group and 51 (SD 9.77) in the control group. In addition, 90% of the sample was below the age of 60. With the retirement age in Kenya being 60 years, this implies most of our sample are in the working-age group and are economically productive. Among them, 90% were female in both the experimental and control group, with the mean years of schooling being 10 years in the experimental group and 11 years in the control group.

In the experimental group, 17% had primary level of education and 83.3% had at least secondary education or more. In the control group, 27% had primary level education and 70% had at least secondary education or more. About 37% of the participants in the experimental group were married while in the control group, 40% were married. Furthermore, 80% of the participants in both the experimental and control group had cancer for more than one year since they were diagnosed.

5.2 Effectiveness Of ACT On Depression Among Patients With Advanced Cancer In Nairobi Hospice, Kenya

The effectiveness of ACT on depression was analyzed using the two factor ANOVA with repeated measures that accounts for both the between-participant and the within-participant effects. Descriptively assessing the trend of depression score between the experimental and control group over time, Figure 1 illustrates that at baseline, the mean depression score of the experimental group was 25 while that of the control group was 23. At midline, the mean score of the experimental group had decreased to 11 and that of the control group had increased to 26. Moreover, at endline, the mean score of the experimental group decreased to 9 while that of the control group increased to 31. These results show that over time, the mean depression score in the experimental group decreased, indicating a decrease in depression levels among participants. However, the mean depression score in the control group increased over time implying an increase in depression among the participants.

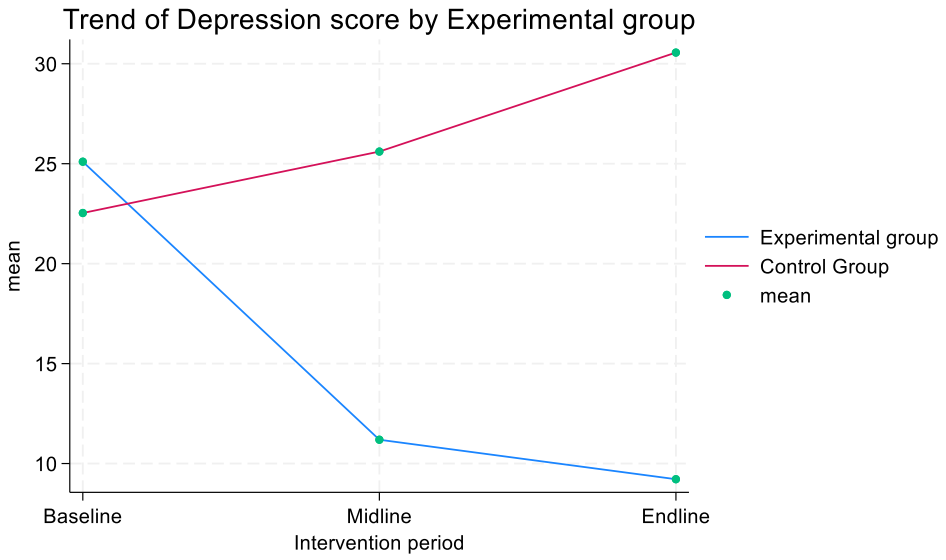

Figure 1 : Trend of Depression Score by Experimental Group

A t-test to test for differences in mean depression score across experimental groups shows that average depression score in the experimental group at midline and endline is significantly different at the 5% level, compared to the mean depression score at midline and endline. In addition, there is no statistically significant difference in the depression score between the experimental and control group at baseline.

Table 3 : ANOVA Results

Source	df	F	Prob>F
Model	63	9.95	0.0000
Intervention	1	20.20	0.0000
time	2	10.73	0.0001
Intervention*time	2	58.71	0.0000

The results on Table 3 show that there was a statistically significant interaction between the intervention and time on the BDI-II scores F (2.98) = 58.71, and 2-tailed *p*-value = 0.000). These results imply that the ACT intervention is effective and differs over time. Following a significant intervention by time interaction, the exact nature of the interaction was explored by exploring the simple main effects which tested the effect of the intervention within one level of the time variable and vice versa. The simple effects were used as opposed to a t-test because the error term used for simple effects is derived using all participants in the study and is generally smaller, thus resulting to greater statistical power.

With the treatment by time interaction being significant, the interaction was then interpreted by testing the simple effects. The effect of time on each intervention level was tested. The study compared the intervention at midline with intervention at baseline, and then at endline with midline. From Table 4 a negative contrast implies a decline in the depression score while a positive sign implies an increase in the depression score. It was observed that the intervention had a larger effect on the experimental group -13.12 points when going from baseline to midline compared with 2.93 points for the control group which is marginally significant, and 2.88 points when going from midline to endline for experimental group though not statistically significant versus 5.96 points for the control group.

Table 4 : The Effect of Time on Each Intervention Level

Time#ntervention	Contrast	Std. err.	t	P>t	[95% conf. interval]	
Midline vs Baseline)						
Experimental	-13.12	1.62	-8.1	0.000	-16.3293	-9.90146
(Midline vs Baseline) Control	2.93	1.56	1.88	0.064	-0.16844	6.025585
(Endline vs Midline)						
Experimental	-2.88	1.70	-1.7	0.093	-6.24455	0.490368
(Endline vs Midline) Control	5.96	1.63	3.66	0.000	2.722337	9.189091

The study further decomposed the interaction term into separate interaction contrasts as shown in Table 5 below. The table indicates that both contrast effects are significantly different from zero, indicating that there is an interaction effect between time and the ACT intervention. This result is consistent with the ANOVA result on Table 3, that showed an overall significant interaction. The effect of the ACT intervention from baseline to midline is 16.04 points greater in the experimental group than control group, and the effect of ACT intervention from midline to endline is 8.83 points greater in experimental than the control group. The p-values and confidence intervals show that there is an interaction effect. Furthermore, the joint test of these two interaction effects aligns with the ANOVA results, as evidenced by the identical F statistic of 58.71.

Table 5 : Decomposing the Interaction Term

Time#Intervention	Contrast	Std. err.	t	P>t	[95% conf. interval]	
(Midline vs Baseline)						
(Control vs Experimental)	16.04	2.25	7.13	0.000	11.58068	20.50723
(Endline vs Midline)						
(Control vs Experimental)	8.83	2.35	3.75	0.000	4.164346	13.50126

The main assumption of the repeated measures ANOVA is that the within-participant covariance structure is exchangeable, which means that the variances at each time are expected to be equal and all the covariances are expected to be equal. Therefore, if the within-participant covariance structure is not exchangeable, then the p-values obtained from the repeated measures ANOVA may not accurately reflect the true probabilities. To account for this, p-values were computed using conservative F-tests namely the Huynh-Feldt epsilon (H-F), Greenhouse-Geisser epsilon (G-G), and Box's conservative epsilon (Box).

Table 6 : Robustness Test for ANOVA Results

			Prob >F			
Source	df	F	Regular	H-F	G-G	Box
Time	2	10.73	0.0001	0.0000	0.0004	0.0019
Intervention*time	2	58.71	0.0000	0.0000	0.0000	0.0000
Residual	98					

From Table 6, we see that the treatment by time interaction is still significant and that even if the data does not meet the exchangeable assumption, the p-values for the conservative F-tests show that p-values are even no matter which correction factor was use.

Alternatively, the results in Table 3 can be represented in a graph as shown in Figure 2 where the predicted probabilities along with the confidence intervals are shown.

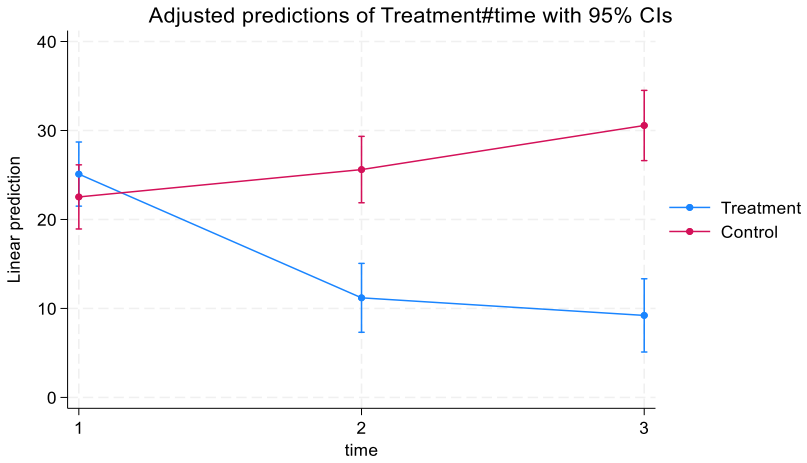

Figure 2 : Adjusted Predictions of Interaction between Time and Treatment

The within participant test indicates that the interaction of time and group is significant, and the main effects are also significant. The significant interaction indicates that the groups are changing over time, and they are changing in different ways as seen in the graph lines of the experimental and treatment groups which are not parallel as was previously shown by the significant interaction in Table 3. This implies the experimental group experiences a decline in depression scores at every time interval, while the depression scores of the control group increase at every time interval.

Thus far, the results show a statistically significant difference in depression scores between the experimental and control group. However, the statistical significance does not tell us how large the difference in depression scores between the groups is. Therefore, the study measured the effect size using Cohen's d formula as shown below.

$$d = \frac{\mu_e - \mu_c}{\sigma_c}$$

where, μ_e is the mean of the experimental group, μ_c is the mean of the control group, and σ_c is the standard deviation of the control group which accounts for the research design. The mean depression score for the experimental group is 9.217 while that of the control group is 30.56 with a standard deviation of 14.425. The results indicate that Cohen's d is -1.48 implying that the average depression score for participants that received the ACT therapy is 1.48 standard deviations lesser than the average depression score of participants that did not receive the ACT therapy (i.e., control group). Therefore, using Cohen's d rule of thumb of 0.8 (absolute) and above to signify a large effect size, the observed effect size of 1.48 is a large effect size, and we can conclude that the actual difference in depression scores between the two groups is nontrivial and is of practical significance.

5.3 Psychological Flexibility

Psychological flexibility was measured using the AAQ questionnaire, which is a 7 item that measures general psychological flexibility. The 7 items (e.g., "I worry about not being able to control my worries and feelings") are answered with 7-point Likert scale from "never true" (1) to "always true" (7). The possible score range is 7 – 49 with a lower score reflecting more psychological flexibility. Higher scores equal greater levels of psychological inflexibility. Scores of >24-28 suggest probable current clinical distress and make future distress and work absence more likely. Cronbach's alpha was 0.93 and this implies there was excellent internal consistency reliability. However, Cronbach's alpha assumes that responses to individual questions are normally distributed, have equal variance, and equally explain the factor. However, these are strong assumptions that are rarely met. Therefore, the study used

McDonalds omega which relaxes these assumptions to test the reliability of the scale and a score of 0.94 which is slightly higher to that obtained from Cronbach's alpha.

AAQ

Table 7: Comparison of AAQ Score between the Intervention Periods

Time period	Contrast (mean difference)	Std. err.	t	P>t	[95% conf.	interval]
Midline vs Baseline	-21.36	2.583223	- 8.27	0.000	-26.50026	-16.21256
Endline vs Baseline	-22.81	2.640255	- 8.64	0.000	-28.06575	-17.55091
Endline vs Midline	-1.45	2.729028	- 0.53	0.596	-6.886111	3.982265

The AAQ questionnaire was administered to the participants in the experimental group at baseline, midline, and endline. Higher scores on AAQ indicate higher psychological inflexibility, a stronger tendency towards experiential avoidance, and more potential psychological distress. This means that when a participant has psychological inflexibility, the participant might struggle with accepting difficult thoughts and feelings and have difficulty acting due to those struggles. Tables 7 shows that the difference between the mean AAQ score at baseline (37) and midline (16) is 21 and this difference is statistically significant (*p-value 0.000)*. This implies that at baseline, the participants had psychological inflexibility while at midline, the participants had achieved psychological flexibility.

Whereas the AAQ score is not meant to be a definitive diagnosis, a decline in the AAQ score like the one observed between baseline and midline is a good indicator of the potential for incorporating ACT techniques in a participant's life. Similarly, when comparing the AAQ score between baseline and endline, the difference is 22 and statistically significant (*p-value 0.000),* which means that by the time the participants received their last intervention, they had achieved psychological flexibility. Furthermore, the difference in AAQ score between midline and endline is 1.45, and this difference is not statistically significant (*p-value 0.596)*. This implies that the psychological flexibility was achieved during the first intervention and subsequent interventions did not influence the psychological flexibility of a participant. Taken into context, these findings suggest that the AAQ could be a valuable tool for assessing participants' readiness to engage with ACT principles.

6 DISCUSSION

6.1 Effectiveness of ACT on Depression among Patients with advanced cancer

This study found a statistically significant effect of the intervention on depression scores as measured by the BDI-II (F (2.98) = 58.71, p-value = 0.000). This finding supports the positive outcomes reported in a systematic review by Mathew et al. (2021). Their review, which rigorously assessed the quality and potential bias of 13 studies involving 537 cancer patients with various diagnoses, concluded that Acceptance and Commitment Therapy (ACT) significantly reduced depression in cancer populations.

A good number of psychotherapeutic approaches have been developed and employed to address psychosocial distress and stressors which are associated with the diagnosis of cancer treatment, with ACT being one of these approaches. Fashler et al. (2018) conducted a review in Canada to establish a description and theoretical rationale for using ACT in psychosocial oncology care that emphasizes emotional distress. In the review, the eligibility criteria accommodated six studies. The cancer cases considered were breast cancer, ovarian cancer, colorectal cancer, and mixed cancer populations at various stages of disease progression or recovery. The outcome of the study revealed that ACT interventions showed a great deal of significant improvements in symptoms. This result aligns with those obtained in this study which revealed that there was a statistical significance between the ACT intervention and the BDI-II scores. This implies that ACT is an effective psychotherapeutic approach in treating depression among cancer patients.

Similalrly, the findings of this study align with the positive outcomes reported in a comprehensive review by Gloster et al. (2020). This review analyzed data from 20 meta-analyses, encompassing over 100 controlled effect sizes and 12,477 participants across various psychological conditions. Their analysis revealed that Acceptance and Commitment Therapy (ACT) was efficacious for a range of mental health concerns, including depression.

Moreover, this study further aligns with the findings of González-Fernández (2019)in Spain. Their systematic review analyzed studies published between 2000 and 2016 and found that ACT interventions improved emotional well-being, quality of life, and psychological flexibility in oncology patients. These findings suggest that ACT can be a valuable tool in managing the psychological distress associated with cancer.

It has been observed that the need for a psychological intervention arises from the moment diagnosis is communicated to cancer patients. The diagnosis of cancer often triggers a cascade of psychological distress, including depression, as highlighted by Kim et al. (2023). Effectively managing this distress throughout treatment is crucial for patient well-being. Data from Datta et al. (2016) in India suggests that Acceptance and Commitment Therapy (ACT) can be a valuable tool in this regard. Their study found ACT to be effective for cancer patients, helping them manage their distress during interventions. The findings of the present study further support this notion. The statistically significant interaction between the ACT intervention and time on BDI-II scores demonstrates that ACT significantly reduced depression in patients with advanced cancer.

Subsequetly, the present study's positive outcomes for ACT in reducing depression align with a prior review by Bai et al. (2020) in China. This comprehensive review analyzed data from 18 studies published between 2010 and 2018, encompassing a total of 1,088 participants. Their analysis revealed that ACT interventions significantly reduced depression scores compared to control groups.

The sampling method in each study significantly contributes to the outcome of the study. In the present study, purposive sampling was one of the sampling methods employed. The present study also had a treatment group, as well as a control group. The results showed that there was a statistically significance between the intervention (ACT) and time on the BDI-II scores (*p*-value = 0.000). This can be seen in a study carried out in Iran which examined the use of purposive sampling to check for the efficacy of ACT on depression as well as psychological flexibility among married women who have breast cancer (Ghorbani et al., 2021). The study recruited 40 women with purposive sampling method, and they were randomly assigned into two groups of 20 each in both the intervention and the control groups. One of the tools used was Acceptance and Action Questionnaire – II (AAQ-II. The study showed that the treatment of ACT reduced the mean depression score significantly ($p < 0.001$), as opposed to the control group. The result of the study indicated that ACT is an effective therapeutic intervention in reducing depression.

A study was conducted in Iran to determine the effectiveness of ACT on depression, using a quasi-experimental research design, in an elderly population (Golestanifar & DashtBozorgi, 2020). The study used purposive sampling method, and the participants were divided into treatment and control groups. Those of the treatment group received 10 sessions of ACT, while those of the control group did not receive the ACT intervention. The experiment showed that ACT led to a reduction in depression and improvement in psychological health. In addition, a study in Iran conducted by Farokhzadian et al. (2020) to check how effective ACT is in reducing depressive symptoms among cancer patients, in a semi-experimental study, also revealed that ACT is very effective in reducing depressive symptoms in cancer patients. These results agree with the present study which also used quasi-experimental research design and the results showed that ACT significantly reduced the BDI-II scores of the experimental group who received it.

6.2 Psychological Flexibility

The aim of ACT is to promote greater psychological flexibility (Watson & Howell, 2023). In the present study, the psychological flexibility result between the baseline and midline was found to be statistically significant (*p-value 0.000)*. This implies that at baseline, the participants had psychological inflexibility while at midline, the participants had achieved psychological flexibility. This is supported by a review of some literature conducted in London on the intervention of ACT, with the aim of showing the consistency of ACT with psychological flexibility (Stockton et al., 2019). The study was conducted as a way of updating and extending the ACT mediation evidence base through a review of mediation studies published since Hayes publication was reviewed. This was done by systematically collating, synthesizing, and assessing the quality of mediation studies published between 2006 and 2015. The inclusion and exclusion criteria accommodated twelve studies. The results of mediation were seen to be highly consistent with the psychological flexibility model of ACT.

A good number of psychotherapeutic approaches have been developed and employed to address psychosocial distress and stressors which are associated with the diagnosis of cancer treatment, with ACT being one of these approaches. Fashler et al. (2018), conducted a review in Canada to establish a description and theoretical rationale for using ACT in psychosocial oncology care that emphasizes emotional distress. In the review, the eligibility criteria accommodated six studies. The cancer cases considered were breast cancer, ovarian cancer, colorectal cancer, and mixed cancer populations at various stages of disease progression or recovery. The result of the study revealed that ACT interventions showed a great deal of significant improvements in symptoms including psychological flexibility. This result validates that of the present study, because when comparing the AAQ score between baseline and endline, the difference was found to be statistically significant (*p-value 0.000),* which means that by the time the participants received their last intervention, they had achieved psychological flexibility.

The efficacy of ACT can further be seen in a study conducted to prove its usefulness in oncology treatment as well as the accompanying psychological distress, like depression. The research was carried out with the aim of analyzing published studies regarding the effectiveness of ACT in treating oncology patients in Spain (González-Fernández , 2019). There was a systematic review of selected literature with the aid Web of Science, as well as Google Scholar, and Dialnet (200-2016). The review revealed that participants who received ACT intervention exhibited better emotional state, quality of life, as well as greater psychological flexibility. The outcome of this study revealed that ACT proved to be verry effective in treating the psychological needs of oncology patients. This was also the case in the present study which addressed the depression faced by patients with advanced cancer, and in the AAQ score between baseline and endline, the difference was found to be statistically significant (*p-value 0.000).* The present study also used ACT as its intervention.

It has been observed that the need for a psychological intervention arises from the moment diagnosis is communicated to cancer patients. This is as a result of the fact that psychological distress such as depression begins from the moment diagnosis is communicated to patients (Kim et al., 2023). There is also the challenge of how patients manage their psychological distress during the psychological intervention. A study was conducted in India to assess how patients manage their distress during psychological and clinical interventions (Datta et al., 2016). The outcome of the study indicated that ACT helped the patients accept and manage their distress well during the intervention due to the achievement of psychological flexibility. This study agrees with the present study, because in the present study, the patients were also able to manage their psychological distress, basically depression, during the period of the intervention. This is so because the result revealed that the AAQ score between baseline and midline was found to be statistically significant (*p-value* 0.000), and their AAQ scores were significantly reduced at endline.

The fact that the present study revealed that the patients with advanced cancer who received the ACT treatment achieved psychological flexibility is also supported by a study conducted in China to check how effective ACT is with mentally ill cancer patients (Li et al., 2021). Publications up to July 2020,

were searched from ten databases, with the help of a combination of search terms that are related to mental health, as well as cancer, and those of randomized control trials. The literature went through the screening of two independent researchers. The research showed that ACT was significantly associated with improved outcomes following the completion of the treatment for depression. The study also revealed that ACT had a strong association with psychological flexibility, which also demonstrated that ACT has the capacity to be an important component of cancer care.

The result of the present study revealed that the depression scores of the patients with advanced cancer reduced significantly, and the AAQ score between baseline and endline also revealed an achievement of psychological flexibility (*p-value* 0.000). These results resonate with that of a study in Iran which examined the effect ACT has on depression, pain acceptance, as well as psychological flexibility among married women who have breast cancer (Ghorbani et al., 2021). A total of 40 women were selected using a purposive sampling method, and were randomly assigned into two groups of 20 each in both the intervention and the control groups. One of the tools used was Acceptance and Action Questionnaire – II (AAQ-II), which was also used to test for psychological flexibility in the present study. The study showed that the treatment of ACT reduced the mean depression score significantly ($p < 0.001$), as opposed to the control group. Additionally, psychological flexibility ($p < 0.05$) also increased significantly. The result of the study indicated that ACT is an effective therapeutic intervention in reducing depression and increasing pain acceptance as well as psychological flexibility among women who suffer from breast cancer. Furthermore, these changes took place as a result of the acceptance of thoughts as well as feelings associated with cancer.

7. CONCLUSION

From the sample size, the participants for the study were assigned into experimental and control groups, with each group having a total of 30 participants each at baseline. The study encountered 16 types of cancer cases at base line. From the 60 participants, the highest recorded type of cancer was breast, and the mean age was 49.65 years. As regards the effectiveness of ACT on depression among the patients with advanced cancer, the results show that there was a statistical significant interaction between the intervention and time on the BDI-II scores, and the participants achieved psychological flexibility. Therefore, we can conclude that the ACT intervention did result in lower depression scores for its participants.

8. RECOMMENDATIONS FOR FURTHER RESEARCH

The present study looked at depression among patients with advanced cancer. It will be a good idea if future studies can explore other forms of psychological distress among patients with advanced cancer. Additionally, in this study, ACT was applied on only patients with advanced cancer. Future studies can do well to look at how ACT works when applied across different types of terminal illnesses.

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