

Depression in Ugandan caregivers of cancer patients: The role of coping strategies and social support

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Abstract

Background: Palliative care services involve the psychological care of the caregivers of cancer patients. Psychological conditions, especially depression among caregivers, distort caregiving roles; thus, it can increase a patient's psychological suffering.

Objective: To determine the prevalence of depression and associated coping strategies among caregivers of cancer patients at a rural cancer care facility.

Methods: This cross-sectional study was among 366 caregivers of cancer patients. The data was collected using a pretested questionnaire, where the symptoms of depression were assessed using the Patient Health Questionnaire-9 at a cutoff of 10 out of 27. The coping strategies were assessed based on the Brief-coping orientation to problems experienced Inventory. Logistic regression was used to determine the factors associated with depression.

Results: The mean age of the participants was 39.01 (± 11.50) years; most were females (60.38%). The prevalence of depression was 8.2%. The identified factors associated with increased likelihood of depression were coping strategies: active coping (aOR = 1.55, 95% Confidence Interval (CI) = 1.05–2.28, $p = 0.026$), denial (aOR = 1.62, 95% CI = 1.20–2.19, $p = 0.001$), and humor (aOR = 1.43, 95% CI = 1.11–1.84, $p = 0.005$). However, coping with positive reframing reduced the likelihood of depression (aOR = 0.70, 95% CI = 0.52–0.94, $p = 0.019$). There was no significant association between depression and social support.

Conclusion: The lower prevalence of depression reported in this study than in the prior Ugandan studies reflects that depression severity among caregivers in rural settings is less prevalent because of the fewer care-associated burdens they experience. Therefore, establishing palliative care near the patients can be a protective factor for caregivers' depression. In addition, the role of social support and coping strategies in depression might be helpful in mental health strategies.

KEYWORDS

active coping, cancer, caregivers, coping strategies, denial, depression, humor, oncology, palliative care, psycho-oncology, rural cancer facility

1 | INTRODUCTION

Palliative care provides patients and their caregivers support to cope with illness and grief.¹ The caregivers also receive multidisciplinary management guidance by psychiatrists, social workers, physicians, etc., providing information about their patient's illness, comfort, and psychological help.¹ Unfortunately, despite the efforts of palliative care services, the prevalence of depression among caregivers of cancer patients has remained high, 42.3% (ranging from 33.31% to 51.29%) based on a 2018 systematic review and meta-analysis.² Despite the presence of palliative care services, the prevalence of depression reported in prior studies was high at 26% and 48.2% among caregivers at Uganda Cancer Institute (UCI).^{3,4}

Likely other countries, due to limited resources and human resources, caregivers of cancer patients have to become an integral supporting part of healthcare providers in the care and management of cancer patients in Uganda.^{3,4} The basic roles of caregivers include providing emotional support, transporting to appointments, preparing meals, giving medications, feeding the patients, ambulating, changing patient position while in bed, maintaining patients' body hygiene, and cleaning the patient wounds.⁵ However, the neurovegetative symptoms (i.e., fatigue, anhedonia, and poor concentration) that are frequent in depressed caregivers make them unable to fulfill their caregiving roles in terms of assisting patients.^{3,4,6} As a result, this greatly impacts the palliative care role of caregivers to their patients, worsening psychological suffering during the palliative care period.⁷

There are multiple factors associated with a higher likelihood of suffering from depression among caregivers of cancer patients. For instance, older age, female gender, spouse caregiver, unemployment, high education status, high caregiving burden, pre-loss grief, financial problems, poor health of the caretaker, and low social function are the commonly reported risk factors.^{2,3,8-10} In addition, caregiver's patients' factors are also associated with depression, such as age (i.e., elderly and very young patients), male gender, cancer stage, duration of living with cancer, and a discrepancy/delay by doctors to evaluate their patients' distressing situation such as constipation.^{2,11}

The different ways/styles/mechanisms/behaviors an individual uses to deal with psychological distress/mental challenges are called coping.¹² When it comes to depression among caregivers, some coping strategies reduce the burden of depression while others are not helpful.¹²⁻¹⁵ For instance, acceptance coping was associated with lower depression symptoms, while the use of emotional support coping increased depressive symptoms among cancer patient caregivers.^{14,15} This dilemma is not limited to the caregiver of cancer patients; for instance, among caregivers' patients of schizophrenia, reinterpretation (positive/negative), positive life growth, social support, usage of religion/spirituality, active coping (a person directly works to control a stressor through appropriately targeted behavior, embracing responsibility for resolving the situation using one's available internal resources¹⁶), acceptance, and positive reframing (think about a negative or challenging situation in a more positive way) were reported as lowering psychological distress, while self-blame, avoidance, and mental disengagement increase distress.¹⁷⁻²² However, the commonly

used coping mechanisms among the caregiver of cancer patients are active coping, seeking external aid, acceptance, and positive reframing, whereas avoidance and use of addictive substances are found as the least used coping strategies.^{12,13,15} In general, most coping strategies can help reduce stress and psychological distress among caregivers, reducing depression and suffering likelihood in this cohort.¹⁹ Besides coping strategies, cancer caregivers also use social support from family, friends, community, or health workers to combat distressing situations while caring for patients.¹² Increased social support help to boost caregivers' self-esteem and provide real-time solutions to cope with depression while caring for loved ones.¹² Despite the role of coping strategies and social support in managing cancer caregivers' depressive symptoms, there is no prior evidence from Uganda. Where the present study aimed to fulfill the knowledge gap for the first time.

There are several studies of depression among caregivers of cancer patients in urban settings where palliative care usually commences.^{2,23,24} However, the prevalence of depression among caregivers in a rural setting is not well known. Katende and Nakimera³ reported that the majority of the cancer patients and their caregivers are from rural settings, usually as a means of referral to the UCI—a national referral facility for cancer patients from peripheral facilities. However, coming from rural settings has to face challenges such as long distances from home, high living costs in the capital (Kampala), etc., and basic medical costs.³ Combating these challenges, the government has decentralized cancer care for patients recovering or palliative care. It is anticipated that caregivers from rural areas might experience different stressors than those in urban settings, thus, different psychological suffering. However, despite two studies assessing depression among caregivers of cancer patients in Uganda,^{3,4} depression prevalence in peripheral/rural cancer centers is unknown. Therefore, this study attempts to identify the prevalence of depression and its associated factors among caregivers of cancer patients in a Ugandan rural cancer treatment center.

2 | METHODS AND MATERIALS

2.1 | Study design and setting

A cross-sectional study among caregivers of cancer patients at Mbarara Regional Referral Hospital (MRRH) cancer center was conducted between August and December 2020 in rural Southwestern Uganda. The MRRH cancer center was founded in 2017 and is the only peripheral cancer center in Southwestern Uganda. It registers about 3000 patients annually, including patients from national referrals for palliative or outpatient care.

2.2 | Participants and sample size

The minimum sample size of 276 was calculated using Epi Info StatCalc for population surveys version 7.2.2.6 at a statistical power of 80, an acceptable margin of error of 5%, a design effect of 1.0, and

a prevalence of 26%.³ We included caregivers of cancer patients aged 18 years and above who consented to participate in this study and recruited them by a convenience sampling approach.

2.3 | Recruitment procedure and data collection

In addition to a running advert of the study at the hospital, all potential participants were approached at the clinic and asked to select an appropriate time of the day so that data collection could be done. Those who scheduled, turned up for the meeting, and consented to the study were approached by the trained research assistants (RAs) in counseling and Responsible Conduct of Research to administer the Runyakole/Rukiga translated pretested questionnaire. This questionnaire captured the participants' sociodemographic characteristics such as age, gender, marital status, level of education, employment status, religion, and monthly income. In addition, the presence of stressful life events experienced (yes/no), perceived social support based on the modified Multidimensional Scale of Perceived Social Support (MSPSS), coping strategies based on Brief coping orientation to problems experienced (COPE), and depression symptoms based on the Patient Health Questionnaire-9 (PHQ-9) were also assessed. Each interview lasted for half an hour. The study was conducted following the country's COVID-19 guidelines (Uganda National Council for Science and Technology) through face-to-face interviews.²⁵

2.4 | Study measures

2.4.1 | Depression

The PHQ-9, a 9-item tool, was used to identify the symptoms of depression. Responses were collected based on a 4-point Likert scale (Not at all = 0, Several days = 1, More than half the days = 2, and nearly every day = 3), with a score ranging from 0 to 27. Depression was categorized based on the score; <5 for none, 5–9 for mild, 10–14 for moderate, 15–19 for moderately severe, and 20–27 for severe depression.²⁶ A score of 10 and above was used to detect probable depression.

PHQ is a freely available tool validated for use in the local language²⁷ and it was widely used in rural parts of southwestern Uganda.²⁸ It has also been used among caregivers of cancer patients.^{29,30} The translated version of the has shown good psychometric properties in Uganda (based on a cutoff of 10).²⁷ Cronbach alpha was 0.87 in this study.

2.4.2 | Perceived social support

The MSPSS was adapted³¹ and made appropriate changes based on input from the Mbarara University of Science and Technology psychiatry team, social worker of MRRH, and potential participants—since

many individuals experienced challenges in answering and understanding the questions during the pretest. Besides, several additions and changes to the scale were made based on the extensive literature review. Finally, nine questions (e.g., “Do you have people who care about what happens to you?”) determine the different kinds of support from friends, family, and significant others. Responses were collected through a 7-point Likert scale (1 = Very strongly disagree to 7 = Very strongly agree) with a score ranging from 9 to 63. The Cronbach alpha for this modified scale was 0.74. The questions used in this study are attached in Appendix 1.

2.4.3 | Brief COPE

The Brief COPE Inventory³² was used to measure the coping strategies among the caregivers of cancer patients. The scale consists of 14 domains of coping under three headings: (i) problem-focused coping (planning, active coping, and use of instrumental support), (ii) emotion-focused coping (acceptance, positive reframing, use of emotional support, humor, religion), and (iii) dysfunctional coping (venting, denial, self-blame, self-distraction, substance use, behavioral disengagement).³² Each of the 14 domains contains two items, and there are 28 items in total to the tool. Each item is rated on a 4-point Likert scale (1 = I have not been doing this at all, to 4 = I have been doing this a lot). The scale has been validated and frequently used among caregivers of cancer patients and other illnesses.^{12,33} The tool had a Cronbach alpha of 0.84 following translation to Runyakole/Rukiga.

2.5 | Ethical consideration

The study complied with the ethical guidelines of the *Declarations of Helsinki*. The Aids Support Organization Uganda research ethics committee has approved the study (reference number: TASOREC/054/2020-UG-REC-009). Before implementing the project, permission for data collection was obtained from the MRRH administration. All participants provided written informed consent to participate in the study. For the participants who did not know how to read and write, the consent was read aloud to them in their preferred language, and they consented to comfortable reading and writing in the presence of their chosen witness. Caregivers with severe depression were provided counseling sessions and referred to the psychiatry unit for further management.

2.6 | Statistical methods

Data were entered into Microsoft Excel, cleaned, and transferred to STATA version 16.0. Descriptive statistics were summarized using mean and standard deviations for continuous data (e.g., age) and percentage and frequencies for categorical variables (i.e., gender). The chi-square test for categorical variables and the independent

sample *t*-test for continuous variables were performed to determine the relationship between study variables and depression. Pearson correlation among social support total score, coping strategies, and depression were used to determine relationships. Logistic regression analysis was used to determine the factors associated with depression, whereas the final model was built using the backward stepwise method. A *p*-value of less than 0.05 was considered statistically significant at a 95% confidence interval.

3 | RESULTS

3.1 | Depression of the caregivers of cancer patients

A total of 366 caregivers of cancer patients participated in the study. Approximately 8.2% ($n = 30$) were depressed based on the PHQ-9 scale (cutoff: 10/27). However, most participants (61.50%) had no depressive symptoms (Figure 1).

3.2 | Participants' sociodemographic characteristics and depression

The mean age of participants was 39.0 ± 11.5 years; the majority were females (60.4%), married (77.1%), and employed (92.1%). As per the national average poverty line of Uganda Shillings (16,643 for each person per month),³⁴ 13.7% of the caregivers were below the poverty line. The patients of caregivers had a mean age of

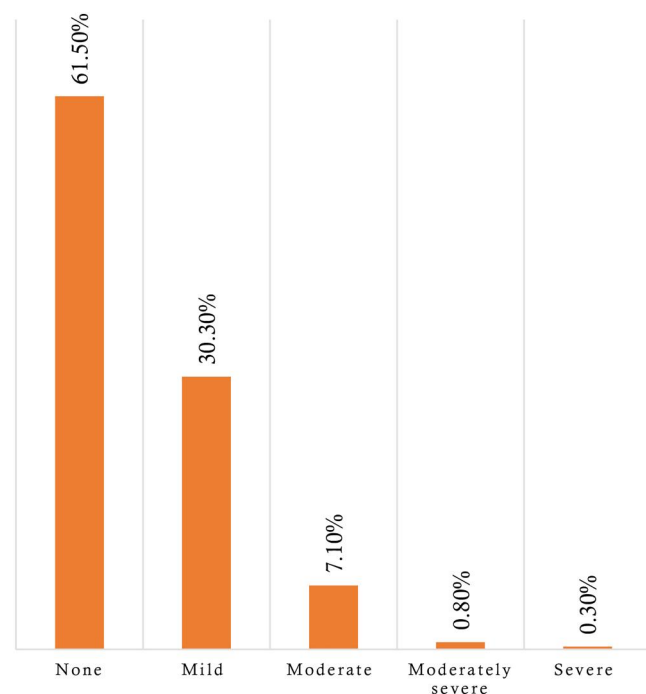


FIGURE 1 Prevalence of depressive symptoms among caregivers of the cancer patients

40.3 ± 21.9 years, and the majority of the patients were females (51.9%). However, there was a statistical difference between the marital status of those depressed and those who were not depressed; depression was highly prevalent among the widowed, followed by divorced/separated participants ($\chi^2 = 8.53$, $p = 0.036$). Patients of caregivers with depression were significantly younger than those without depression (31.6 ± 22.2 vs. 41.0 ± 21.8 , $p = 0.024$) (Table 1).

3.3 | Participants' social support and depression

Caregivers with depression received more social support than those without depression (34.53 ± 5.62 vs. 32.23 ± 5.31 , $p = 0.024$). The highest level of social support often reported was getting a special person to share their joy and sorrow (mean 4.0 ± 1.1 , out of 7), and the lowest often reported social support was getting a chance to talk to someone about their problems at work or home (mean of 2.4 ± 1.7 , out of 7). On average depressed individuals significantly received more social support than non-depressed caregivers, that is, having people who care about what happens to them (4.2 ± 1.1 vs. 3.5 ± 1.1 , $t = -3.37$, $p < 0.001$); getting access to a special person/friend/family member around when you are in need (4.0 ± 0.8 vs. 3.6 ± 0.9 , $t = -2.48$, $p = 0.014$), often getting family really trying to help them (4.3 ± 1.1 vs. 3.8 ± 1.1 , $t = -2.33$, $p = 0.020$), and often getting the emotional help and support from their family (4.3 ± 1.2 vs. 3.8 ± 1.1 , $t = -2.17$, $p = 0.031$).

3.4 | Participants' coping strategies and depression

Most caregivers used religion as a coping mechanism (5.8 ± 0.7 , out of 8), and humor was the least used coping mechanism (1.1 ± 1.6 , out of 8). Depressed caregivers were actively coping compared to non-depressed ones (5.9 ± 1.2 vs. 5.1 ± 1.0 , $p < 0.001$). Also, they coped more with denial (4.4 ± 1.7 vs. 2.4 ± 1.8 , $p < 0.001$). On average, planning, humor, acceptance, and self-blame were the significantly dominant coping mechanisms among depressed caregivers ($p < 0.05$). However, positive reframing was less among depressed caregivers than those without depression (2.5 ± 1.6 vs. 3.5 ± 1.2 , $p < 0.001$).

3.5 | Correlation between coping strategies, social support, and depression

Apart from coping with emotional support, acceptance, and religion, the correlation between depression severity and coping strategies was significant. Depression symptom severity had moderately positive strong correlations with self-blame ($r = 0.52$) and denial ($r = 0.53$). However, humor had low positive correlations ($r = 0.45$). The rest of the significant correlations with depression severity were negligible. The total social support score had a low positive significant correlation with depression ($r = 0.39$). The highest statistically significant

TABLE 1 Relationship between studied variables and depression

Variable	n (%)	Normal (n = 336, 91.8%)	Depression (n = 30, 8.2%)	t/ χ^2 (p-value)
Age (mean \pm SD)	39.0 \pm 11.5	39.2 \pm 11.5	36.9 \pm 11.1	1.04 (0.294)
Gender				
Females	221 (60.4)	200 (90.5)	21 (9.5)	1.26 (0.261)
Males	145 (39.6)	136 (93.8)	9 (6.21)	
Marital status				
Married/cohabiting	282 (77.1)	262 (92.9)	20 (7.1)	8.53 (0.036)
Divorced/separated	7 (1.9)	6 (85.7)	1 (14.3)	
Single	63 (17.2)	58 (92.1)	5 (7.9)	
Widowed	14 (3.8)	10 (71.4)	4 (28.6)	
Level of education				
No formal education	15 (4.1)	14 (93.3)	1 (6.7)	3.85 (0.278)
Primary	171 (46.7)	152 (88.9)	19 (11.1)	
Secondary	93 (25.4)	87 (93.5)	6 (58.1)	
Tertiary	87 (23.8)	83 (95.4)	4 (4.6)	
Employment status				
Employed	337 (92.1)	309 (91.7)	28 (8.3)	0.07 (0.790)
Unemployed	29 (7.9)	27 (93.1)	2 (6.9)	
Monthly income (poverty level status) ^a				
Above poverty line	316 (86.3)	290 (91.8)	26 (8.2)	0 (0.956)
Below poverty line	50 (13.7)	46 (92.0)	4 (8.0)	
Stressful event experience				
No	16 (4.4)	16 (100)	0	1.49 (0.222)
Yes	350 (95.6)	320 (91.4)	30 (8.6)	
Social support group involvement				
No	98 (26.8)	94 (95.9)	4 (4.1)	3.01 (0.083)
Yes	268 (73.2)	242 (90.3)	26 (9.7)	
Patient's age (mean \pm SD)	40.3 \pm 21.9	41.0 \pm 21.8	31.6 \pm 22.2	2.26 (0.024)
Patient's gender				
Female	190 (51.9)	176 (92.6)	14 (7.4)	0.36 (0.548)
Male	176 (48.1)	160 (90.9)	16 (9.1)	
Social support	32.42 \pm 5.37	32.23 \pm 5.31	34.53 \pm 5.62	-2.26 (0.024)
People who care about what happens to you	3.5 \pm 1.08	3.5 \pm 1.1	4.2 \pm 1.1	-3.37 (<0.001)
Getting love and affection	3.6 \pm 0.8	3.6 \pm 0.7	3.6 \pm 0.9	0.32 (0.752)
Getting a chance to talk to someone about your problems at work or home	2.4 \pm 1.7	2.4 \pm 1.7	2.8 \pm 1.8	-1.17 (0.241)
Getting a chance to talk about your personal or family problems	3.9 \pm 0.8	3.9 \pm 0.8	3.8 \pm 1.1	0.63 (0.529)
Getting a chance to talk about money issues	3.7 \pm 0.8	3.7 \pm 0.8	3.5 \pm 1.1	1.76 (0.079)
Getting access to a special person/friend/family member around when you are in need	3.6 \pm 0.9	3.6 \pm 0.9	4.0 \pm 0.8	-2.48 (0.014)

(Continues)

TABLE 1 (Continued)

Variable	n (%)	Normal (n = 336, 91.8%)	Depression (n = 30, 8.2%)	t/ χ^2 (p-value)
Getting a special person to share your joy and sorrow	4.0 ± 1.1	4.0 ± 1.1	4.2 ± 1.1	-1.13 (0.258)
How often does your family really try to help you	3.8 ± 1.1	3.8 ± 1.1	4.3 ± 1.1	-2.33 (0.020)
How often do you get the emotional help and support you need from your family	3.8 ± 1.2	3.8 ± 1.1	4.3 ± 1.2	-2.17 (0.031)
Brief cope				
Self-distraction	3.3 ± 1.3	3.3 ± 1.3	3.2 ± 1.4	0.20 (0.837)
Active coping	5.2 ± 1.1	5.1 ± 1.0	5.9 ± 1.2	-3.69 (<0.001)
Denial	2.5 ± 1.9	2.4 ± 1.8	4.4 ± 1.7	-5.96 (<0.001)
Substance use	0.6 ± 1.2	0.5 ± 1.2	0.8 ± 1.7	-1.17 (0.242)
Emotional support	3.6 ± 1.1	3.6 ± 1.0	3.5 ± 1.5	0.32 (0.749)
Use of informational support	3.5 ± 1.1	3.6 ± 1.1	3.3 ± 1.2	1.36 (0.174)
Behavioral disengagement	2.5 ± 1.5	2.4 ± 1.5	2.6 ± 1.4	-0.50 (0.616)
Venting	2.5 ± 1.2	2.4 ± 1.2	2.6 ± 1.5	-0.79 (0.432)
Positive reframing	3.4 ± 1.3	3.5 ± 1.2	2.5 ± 1.6	4.19 (<0.001)
Planning	4.0 ± 1.0	4.0 ± 1.0	4.6 ± 1.1	-3.47 (0.001)
Humor	1.1 ± 1.6	1.0 ± 1.6	1.8 ± 2.0	-2.58 (0.010)
Acceptance	3.9 ± 1.1	3.9 ± 1.1	4.4 ± 1.1	-2.33 (0.020)
Religion	5.8 ± 0.7	5.8 ± 0.7	6.1 ± 0.6	-1.90 (0.057)
Self-blame	1.6 ± 1.7	1.5 ± 1.6	2.9 ± 1.8	-4.39 (<0.001)

Note: t-value was used for continuous variables. Bold indicates statistical significance (p -value < 0.05).

correlation between the included variables was between two coping strategies, self-blame and humor, $r = 0.60$. Social support had a low positive significant correlation with depression severity, $r = 0.39$. Social support had low positive significant correlations with the following coping strategies: denial ($r = 0.41$) and self-blame ($r = 0.35$). However, low negative significant correlations were found between self-distraction ($r = -0.32$), emotional support ($r = -0.31$), and positive reframing ($r = 0.35$) with social support (Table 2).

3.6 | Factors associated with depression

Due to multicollinearity, the individual items of social support were not included in logistic regression. Following bivariate logistic analysis, being widowed, an increase in total social support score, and coping with active coping, denial, humor, or self-blame increased the likelihood of depression among caregivers. However, an increase in caregivers' patients' age, coping with the use of information support, and positive reframing reduced the likelihood of depression among caregivers. The significant factors were tested for collinearity; all had variance inflation factor (VIF) below 3 (mean VIF = 1.41). These were used to develop the final model using backward stepwise modeling. Following the Wald test and testing for the goodness of fit of each model, marital status, patient age,

total social support score, use of information support, and self-blame were eliminated from the models in a stepwise manner, based on the variables with the least significant effect. The final model had a sensitivity of 6.67%, specificity of 100%, a positive predictive value of 100%, a negative predictive value of 92.31%, and correctly classified 92.35% depression among caregivers. The model had goodness of fit p -value = 0.071 for the four variables. At multivariate analysis, the following coping mechanisms were associated with increased likelihood of depression among caregivers: (i) active coping (aOR = 1.55, 95% CI: 1.05–2.28, $p = 0.026$), (ii) denial (aOR = 1.62, 95% CI: 1.20–2.19, $p = 0.001$), and (iii) humor (aOR = 1.43, 95% CI: 1.11–1.84, $p = 0.005$). However, coping with positive reframing reduced the likelihood of depression (aOR = 0.70, 95% CI: 0.52–0.94, $p = 0.019$) (Table 3).

4 | DISCUSSION

For the first time, this study assesses the prevalence of depression along with the role of social support and coping strategies in the depression of the caregivers of cancer patients in a Ugandan rural setting. It is found that 8.2% of caregivers of cancer patients at the MRRH cancer unit had depression, and active coping, denial, and humor were associated with an increased likelihood, whereas

TABLE 2 Correlation between participants' social support score, coping strategies, and depression severity

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Total social support score (1)	1															
Self-distraction (2)	-0.32**	1														
Active coping (3)	0.11*	-0.06	1													
Denial (4)	0.41**	-0.23**	0.24**	1												
Substance use (5)	0.01	0.10	-0.10	0.13*	1											
Emotional support (6)	-0.31**	0.24**	-0.04	-0.08	0.22**	1										
Use of informational support (7)	-0.22**	0.28**	0.02	-0.15**	0.10	0.53**	1									
Behavioral disengagement (8)	0.16**	0.16*	-0.11*	0.14**	0.28**	0.07	0.10	1								
Venting (9)	-0.04	0.29**	-0.23**	0.07	0.36**	0.23**	0.19**	0.33**	1							
Positive reframing (10)	-0.35**	0.32**	-0.10*	-0.35**	0.07	0.24**	0.35**	0.13*	0.35**	1						
Planning (11)	-0.01	0.07	0.51**	0.19**	0.05	0.06	0.24**	0.04	-0.01	0.04	1					
Humor (12)	0.24**	0.07	-0.23**	0.30**	0.40**	0.17**	0.10	0.31**	0.46**	0.01	-0.12*	1				
Acceptance (13)	-0.07	0.16**	0.34**	0.02	0.04	0.16**	0.19**	0.10	-0.04	0.18**	0.28**	-0.01	1			
Religion (14)	-0.23**	0.18**	0.40**	-0.07	-0.12	0.06	0.17**	-0.1*3*	-0.14**	0.09	0.30**	-0.22**	0.30**	1		
Self-blame (15)	0.35**	-0.01	-0.09	0.49**	0.31**	0.09	0.01	0.31**	0.40**	-0.17**	0.02	0.60**	-0.12*	-0.28**	1	
Depression severity (16)	0.39**	-0.12*	0.11*	0.53**	0.17**	-0.06	-0.11*	0.17**	0.20**	-0.30**	0.13*	0.45**	0.06	-0.08	0.52**	1

Note: * = *p* value less than 0.05; ** = *p* value less than 0.001; very high correlation positive (negative) = $r^2 = 0.90-1.00$ (-0.90 to -1.00); high positive (negative) correlation = $0.70-0.90$ (-0.70 to -0.90); moderate positive (negative) correlation = $0.50-0.70$ (-0.50 to -0.70); low positive (negative) correlation = $0.30-0.50$ (-0.30 to -0.50); Negligible correlation = $0.00-0.30$ (0.00 to -0.30).

TABLE 3 Bivariate and multivariate analysis for factors associated with depression

Variables	Bivariate analysis		Multivariate analysis		Final model	
	Crude odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value
Age	0.98 (0.95–1.02)	0.294				
Gender						
Females	1					
Males	0.63 (0.28–1.42)	0.264				
Marital status						
Married/cohabiting	1		1			
Divorced/separated	2.18 (0.25–19.03)	0.480	0.51 (0.04–5.67)	0.580		
Single	1.13 (0.41–3.13)	0.815	1.15 (0.36–3.72)	0.813		
Widowed	5.24 (1.51–18.21)	0.009	2.71 (0.69–10.61)	0.152		
Level of education						
No formal education	1					
Primary	1.75 (0.22–14.06)	0.599				
Secondary	0.96 (0.11–8.63)	0.975				
Tertiary	0.67 (0.70–6.49)	0.733				
Employment status						
Employed	1					
Unemployed	0.82 (0.18–3.62)	0.791				
Monthly income (poverty level status) ^a						
Above poverty line	1					
Below poverty line	0.97 (0.32–2.91)	0.956				
Stressful event experience						
No	1					
Yes	Omitted					
Social support group involvement						
No	1					
Yes	2.52 (0.86–7.43)	0.093				
Patient's age (mean ± SD)	0.98 (0.96–0.99)	0.027	0.98 (0.96–1.00)	0.084		
Patient's gender						
Female	1					
Male	1.26 (0.59–2.66)	0.549				
Total social support score	1.09 (1.01–1.17)	0.026	0.94 (0.87–1.03)	0.212		
Brief cope						
Self-distraction	0.97 (0.73–1.28)	0.837				
Active coping	1.97 (1.36–2.87)	<0.001	1.68 (1.10–2.28)	0.016	1.55 (1.05–2.28)	0.026
Denial	1.93 (1.50–2.49)	<0.001	1.46 (1.06–2.01)	0.020	1.62 (1.21–2.19)	0.001
Substance use	1.16 (0.90–1.49)	0.246				
Emotional support	0.94 (0.67–1.34)	0.748				
Use of informational support	0.73 (0.54–0.99)	0.043	0.85 (0.56–1.27)	0.429		
Behavioral disengagement	1.18 (0.97–1.44)	0.090				

TABLE 3 (Continued)

Variables	Bivariate analysis		Multivariate analysis		Final model	
	Crude odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value
Venting	1.28 (0.99–1.63)	0.050				
Positive reframing	0.59 (0.45–0.78)	<0.001	0.67 (0.48–0.93)	0.017	0.70 (0.52–0.94)	0.019
Planning	1.02 (0.76–1.36)	0.887				
Humor	2.72 (1.57–4.69)	<0.001	1.41 (1.02–1.95)	0.033	1.43 (1.11–1.84)	0.005
Acceptance	0.85 (0.64–1.12)	0.245				
Religion	0.69 (0.44–1.08)	0.106				
Self-blame	2.20 (1.59–3.06)	<0.001	1.18 (0.85–1.64)	0.320		

Note: Bold indicates statistical significance (p -value < 0.05).

Abbreviation: CI, Confidence Interval.

positive reframing reduced the likelihood of experiencing depressive symptoms.

The prevalence reported in this study (8.2%) is lower compared to the prior Ugandan studies, that is, 26% and 48.2% among caregivers of cancer patients at the UCI.^{3,4} The difference may be due to the different tools used to screen for depression in the studies - Hospital Anxiety and Depression Scale in the previous studies,^{3,4} whereas the PHQ-9 for this study. Different tools have different psychometric properties and reliability in screening for depression leading to the differences.³⁵ In addition, the sample characteristics such as cancer staging in the patient, caregivers' relationship to the patient, etc., may also be responsible for the difference. Furthermore, the difference could be because of prior studies that were conducted in a facility that treats severely ill patients, and their caregivers face multiple stressors such as financial strain, more extended hospital stay, and little or no social support since the majority are far from home, which likely to increase depression.^{3,4} The present study showed that cancer patients who get medical care and social support near their homes might be one of the protective factors in reducing burdens to the respective caregivers. Likely, the caregivers have already learned to cope with the distressing factors for a long-time journey of caregivers with terminal stage patients. At the same time, the caregivers might experience positive feelings like joy and hope as their investments return from the patients in the recovery stage. However, those factors are easily anticipated to lower the depression prevalence rate in the present study compared with the prior Ugandan studies. The depression rate reported in this study is also still lower than facility and home-based palliative care caregivers from other countries.^{2,8-11} The low prevalence of depression may indicate that patients' management facilities near their homes cause less caregiver stress, though comparative studies are needed for such anticipation.

Positive reframing is a coping strategy used to positively view or perceive negative or depressed feelings or stimulants.²⁰ As reported by other studies, positive reframing was associated with reducing depressing symptoms among caregivers of cancer patients.^{20,22} This is attributed to its positive relationship with gratitude and the

important aspect of reducing depression.²⁰ Although the active coping mechanism has been studied to be a positive way of coping where individuals are aware of the stressors and conscious attempt to reduce mental health conditions like depression and psychological distress, thus less likely to experience depression,^{14,16,36} it was surprisingly associated with increasing the likelihood of depression in this study. This may be due to the following reasons: (i) the group that used active coping may be experiencing higher levels of depression than caregivers using other coping strategies. They might have tried other means and now resort to active coping to handle their problems; (ii) the coping efforts they are changing to are ineffective due to the neurovegetative symptoms associated with depression; and (iii) these individuals may already have other uncontrollable and amendable stressors such as medical illnesses, undiagnosed depression among others, that are not amendable to approach orientation strategies. Similar to active coping, humor -another positive coping strategy relationship with increased depression, may be explained by the aforementioned reasons. In addition, these individuals may be trying to prevent other family members from feeling the gravity of the depressing situation they are going through while caregiving. Like other studies, caregivers with a denial coping mechanism were more depressed.²¹ Denial is a maladaptive way of coping which may impact emotional and mental wellbeing. The coping mechanisms associated with depression were also positively correlated with each other, putting these individuals at higher risk of depression. As seen in this population, each individual has different coping methods; to the surprise, even those with positive coping are depressed and may need more knowledge on coping skills and be addressed differently. This study calls for new approaches by the palliative care providers to combat depression in caregivers for better patient care and to achieve palliative care goals.

This study found a low positive correlation between depressive symptom severity and social support, a finding contradictory to other studies.³⁷ This may be because participants in our study have been with patients for a longer time, especially those referred to end-of-life care. In addition, these caregivers are from rural settings. Culturally, people with sick patients are given adequate social

support by family and community by regularly visiting them at the hospital.³⁸ Our participants had a negative correlation between the coping strategy associated with depression (positive reframing) and social support, whereas a negative-positive correlation was between coping strategies associated with depression (denial, active coping, and humor) and social support; findings contradictory to the study by Roohafza and colleagues.³⁹ This may be an effect of the type of cancer patients managed at this peripheral rural cancer unit.

Despite previous studies from Uganda showing an association between depression and sociodemographic factors such as relationships with the patients,³ no such relationship was established here due to the effect of adding coping skills and social support to our model to explain depression and not adding family relationships. However, there was a relationship between being depressed and widowed marital status in this study, which was not identified in other studies based on the literature search. Therefore, the finding may be attributed to widows already lamenting a loss, an aspect of grief and distress.²

4.1 | Clinical implications

The present study results showed a lower prevalence of depression than previous studies in the country, indicating that cancer patients being managed from peripheral cancer units near their homes and their caregivers lead to less likelihood of experiencing depression. This information can be used in triaging patients to manage less severe cases from these peripheral rural facilities instead of the UCI or urban centers. Also, patients at the end of life can be managed at these rural facilities to have less depression among their caregivers and help them benefit from the vast social support near their homes.

Contradictory to most literature, positive coping mechanisms such as active coping and use of humor were associated with an increased likelihood of depression. This information is relevant to clinical psychologists working with cancer patients, and their caregivers should always watch out for depression among patients who cope with these positive strategies. Also, information should be passed on to caregivers and patients to help the caretakers who seem to cope with humor despite prevailing situations to improve social support and reduce depression among caregivers of cancer patients.

4.2 | Study limitations

These results should be interpreted cautiously because it is a cross-sectional study, and causality cannot be easily established. In addition, a convenience sample was used, which may prevent the generalizability of the study findings. A total of 366 caregivers consented to participate in the study, whereas four approached caregivers refused. In addition, the tools used in this study have never been validated for use among cancer caregivers in Uganda; therefore,

reliability and generalization of the findings to the settings cannot be made. Also, the MSPSS was modified for this study, which could have affected its psychometric properties, leading to most of its items being non-significant in regression analysis. Finally, the study did not include all essential patient-related variables such as caregivers' relationship with the patient, length of patient stays in the hospital, cancer stage, and diagnosis, which limited the study.

5 | CONCLUSION

There was a relatively lower prevalence of depression among caregivers of cancer patients compared to other studies done at the UCI. However, caregivers who use active coping, humor, and denial may require more psychological support in dealing with their stressors since they are associated with higher levels of depression. Therefore, positive reframing should be encouraged by psychotherapists and mental health professionals while working with cancer patients and palliative care, and they should emphasize it when managing depression with a cognitive-behavioral approach.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

DATA AVAILABILITY STATEMENT

The data supporting this study's findings are available from the corresponding author upon request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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