Relationship of Muslim Religiosity and Death Anxiety with the Mediating Effect of Optimism and Depression Among Cancer Patients

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Abstract

Optimism and the practice of any religion are known to reduce depression and anxiety in cancer patients; however, in the present study, the specific role of Muslim religiosity, optimism, depression, and death anxiety in cancer patients has been explored. The sample of this study consists of 200 cancer patients from different hospitals of the districts Faisalabad and Lahore (Pakistan). The sample's average age was 26.6 years. Parallel mediation findings show that optimism and depression are significant mediators between Muslim religiosity and death anxiety among cancer patients. Muslim religiosity is positively associated with optimism, and it helps to decrease the level of death anxiety, while depression is negatively associated with Muslim religiosity, and high depression increases the death anxiety level of cancer patients. In conclusion, Muslim religiosity and optimism play significant roles in managing depressive symptoms and death anxiety among cancer patients.

Introduction

One of the leading causes of reduction in global life expectancy is cancer, and its prevalence is rising (Ferlay et al., 2015). In 2008 its prevalence was estimated to be around 7.6 million globally, and in 2020 it reached approximately 19.3 million (Sung et al., 2021; World Health Organization, 2008). In 2012, the cancer prevalence in Europe was estimated to be around 1.75 million, with 56% men and 44% women (Gabriele et al., 2016). Moreover, about 17–23% of all cancer deaths are due to lung cancer (Koyama et al., 2016). According to a landmark report of 50 countries of the world published by the World Cancer Research Fund and American Institute for Cancer Research (2018), the average global incidence of cancer was around 197.9/100,000, with men having the cancer incidence of around 218.6/100,000 and women having it at around 182.6/100,000. Furthermore, as per the report mentioned above, Australia was ranked at the top with the highest overall cancer incidence of 468.0/100,000. New Zeeland had the second-highest number, i.e., 438.0/100,000, and Israel was at the lowest rank with the cancer incidence of 233.6/100,000. Compared with European countries, the cancer prevalence is comparatively higher in developing Asian countries (Takahiro & Shin, 2018). In China, cancer incidence has been reported to be around 278.07/100,000, which indicates a higher risk of cancer (Chen et al., 2018). In Pakistan, estimates from 2012 suggest that the overall 1-year incidence of cancers was somewhat around 80/100,000 with females having a relatively higher prevalence of 93.2/100,000 than men, i.e., 66/100,000 (Sarwar, & Saqib, 2017). A recent estimate suggests that around 0.18 million new cases were reported in Pakistan, and approximately 0.12 million deaths occurred out of 220 million population in the year 2020, which could be considered high (International Agency for Research on Cancer, 2020). Whereas in 2005, an estimated 85000 people died in Pakistan because of cancer; this could indicate a rise in the problem of cancer in Pakistan (Bhurgri et al., 2006).

Breast cancer is one of the biggest worries for Pakistani women; in one study, it was noted that, of all the cancers found in women, 79.2% were suffering from breast cancer (Badar & Mahmood, 2017). Furthermore, Atomic Energy Cancer Hospitals in Pakistan estimated that 40% of patients they treated came in with breast cancer in 2015–2016, which is alarming (Firdous, 2017). According to a World Cancer Report (Boyle & Levin, 2008), 31.5 breast cancer cases per 100,000 women are reported yearly in Pakistan. As per another study, breast cancer is the most widespread, most serious, and most frequently diagnosed cancer of women (affecting about one in nine women) in Pakistan that causes the most number of deaths of women compared to any other cancer; more concerning is that this rate of prevalence is more than twofold of its neighboring countries Iran and India (Asif, Sultana, Akhtar, Rehman, & Rehman, 2014). Hence focusing on cancer and its related psychological factors is of utmost importance for Pakistani people, especially women suffering from it.

Life-threatening disease such as cancer significantly affects a person both anatomically and psychologically (Pizzoli et al., 2019). Psychological problems like continuous stressful life experiences, physical fatigue, sleep disturbance, body

pain, muscle tension, headache, irritable mood, and lack of interest have commonly been reported among cancer patients (Craft et al., 2012; Ho et al., 2015). A general fear is usually present in the patient during the diagnostic procedures when s/he suspects that s/he is at risk of being diagnosed with cancer, however in some cases, this fear becomes very problematic; furthermore, psychiatric disorders such as depression and anxiety-related disorders are also commonly reported in patients with cancer (Gregurek et al., 2010). Depression has been observed as one of the comorbid biopsychological factors in oncology patients but is often overlooked by health providers when patients require immediate emotional support (Ng & Zainal, 2014). Estimates of depression rate in cancer patients vary widely, i.e., from 1.5–50% (Khamechian, Alizargar, & Mazoochi, 2013). Moreover, cancer patients with depression use more negative coping methods (Ng et al., 2017). Therefore, healthy coping strategies are essential for managing depression and stress in such patients; in this vein, many researchers have identified religion as one of the more beneficial coping strategies (Aflakseir & Mahdiyar, 2016; Meer & Mir, 2014). In religious coping, people displace environmental stressors, which are not in their control, towards God, which helps them against feeling helpless and developing learned haplessness (Thune et al., 2006). Furthermore, religious involvement has been shown to induce a sense of optimism and an array of constructive behavior strategies which seem to buffer the cancer patient from developing psychiatric problems (Ellison et al., 2008). A person's involvement in religious activities can help them become mentally stronger, contented, conflict-free, stable, realistic, and optimistic (Ellison et al., 2008; Koenig et al., 1988; Thune et al., 2006;). Being optimistic, in turn, is a positive and active trait that creates healthy beliefs in a person (Rajandram et al., 2011).

Religious practices usually play a fundamental role in the life of a practicing religious person (Aflakseir & Mahdiyar, 2016). Islam is a religion whose followers identify themselves as Muslims; it has more than 1.5 billion followers worldwide and is one of the three largest Abrahamic religions (Longfellow, 2018). However, as per our knowledge, research regarding Muslim religiosity and its role in managing chronic illnesses (like cancer) is relatively scarce (Haghighi, 2013). Islam has been usually referred to as a particular way of life (Basri et al., 2015). Therefore an investigation of its relevance in facing and adjusting to a chronic illness like cancer is needed. A review of ninety-three studies published by psychologists and psychiatrists of the United States of America, Europe, Arab Countries, and Iran by Dadfar and Lester (2017) explored how religiosity and spirituality correlate with death anxiety. They concluded that various studies revealed that religiosity, spirituality, well-being, sex, person's age, and culture are the significant factors that influence or affect death anxiety (Khezri et al., 2015).

Religious involvement develops optimistic behaviors and may help people manage their emotions, thereby making them mentally more stable; frequent involvement in religious activities also helps people overcome negative thinking, developing optimism, hope, and patience, and reducing the fear of death (Haghighi, 2013). A person's lack of religious and spiritual involvement could lead them to become psychologically distressed (Coyne, Tennen, & Ranchor, 2010). Furthermore, low religious involvement contributes to developing depression and anxiety in a person (Basri et al., 2015; Ballenger et al., 2001). To the best of our knowledge and literature search, Muslim religiosity and distress level have not been investigated in oncology patients of Pakistan.

The current study investigates the association between Muslim religiosity, optimism, death anxiety, and depression in cancer patients. We hypothesized that:

1. optimism and depression will act as parallel mediators between the relationship between Muslim religiosity and death anxiety.
2. depression and death anxiety levels would significantly differ among patients with cancer stages I, II, III, and IV.
3. level of depression would be significantly different among low, middle, and high socioeconomic in cancer patients.
4. level of death anxiety would be significantly different among different types of cancer

Materials And Methods

Research design

It was a cross-sectional study. We carried it out in two hospitals of the Punjab province of Pakistan, i.e., Jinnah hospital Lahore and Allied hospital Faisalabad. We calculated the sample size of this study through G-Power software (version 3.1.9.4) with an effect size of 0.40, α error 0.001 with power of 0.95 (Faul et al., 2009). G-Power calculator generated a sample size of 196 participants; we recruited 253 participants, and 200 participants met study inclusion and exclusion criteria.

Participants

In this study, N = 253 participants from outpatient facilities of two hospitals in Punjab (Pakistan) were recruited. Out of these, 53 were excluded due to their non-completion of screening measures or their mismatch with the inclusion criteria. Purposive sampling technique was employed to recruit the participants. Only those patients, who were undergoing chemotherapy treatment for their cancer, were recruited as participants of this study.

Inclusion and exclusion criteria

Relatively stable, literate, and willing cancer patients of any stage were included in the present study as participants. Patients in a profoundly debilitating health condition or recovering from any major surgery were excluded from this study. Patients with a head injury, physical disability, or severe difficulty communicating were also excluded from this study. Patients receiving in-patient treatment were also excluded. Furthermore, we tried our best to recruit participants who were, apparently, a bit motivated to participate and were somewhat eager to spend some time for the psychological test administration.

Measures

The consent form was the first page of the questionnaire that was presented to each participant: consent form contained the information about research, researchers' aims, confidentiality, privacy, choice of withdrawal, and that the participant's initials/signatures on the form signify their willingness to take part in the research. The following form in the questionnaire was the personal information form which asked about the demographics of the participants, i.e., gender, marital status, age, education, residence, home (own, rented), work status, total earning member, monthly income, cancer type, age at diagnosis, stage of cancer, type of treatment they were receiving, and who was the caregiver of the patient.

Short Muslim Practice and Belief Scale (SMPBS), initially developed by Tayyiba AlMarri (2009) and translated into Urdu by Ghayas and Batool (2016), was used to measure Muslim religiosity. SMPBS measures the level of involvement in Islamic religious activities and explores other related religious features. The scale has two parts; the first part comprises 9 Items with two sub-scales (religious practice and religious belief). The second part consists of 5 items that depict religious belief. SMPBS Cronbach's alpha reliability coefficient for the Urdu version was 0.78, and convergent validity was established with religious practice and belief scale was reported as 0.64. In contrast, divergent validity was established with the depression scale and was reported as -0.18 (Ghayas, & Batool, 2016). The internal reliability of the Short Muslim Practice and Belief Scale, as reported by Ghayas and Batool (2016), was 0.83. In the current sample, SMPBS Cronbach's alpha reliability was estimated at 0.89.

Life Orientation Test-Revised (LOT-R, Scheier, Carver & Bridges, 1994) is a 10-item scale created to measure optimism versus pessimism. This scale uses a 5-point Likert scale to tap the responses of participants. The responses can range from 0 (strong disagreement) to 4 (strong agreement); higher scores reflect optimism, and lower scores reflect

pessimism. An example item is "In uncertain times, I expect the best." In the current research, the Urdu version of LOT-R by Ayub (2004) was used. This scale's Cronbach alpha reliability was reported by Ayub (2004) as 0.60, whereas, in the current study, it was 0.74. Furthermore, internal consistency was reported as 0.76 and test-retest reliability (with 4 – week interval) as 0.79 by Ayub (2004).

*Siddiqui-Shah Depression Scale (*SSDS), developed by Siddiqui and Shah (1997), was used in the present study to measure depression. SSDS has 36 items. Each item is evaluated on a 4-point Likert-type rating scale ranging from '0 = Never' to '3 = Most of the time'. Split-half reliabilities for the clinical sample were 0.79 and 0.84, and for non-clinical samples were found 0.80 and 0.89 respectively; furthermore, the alpha coefficient for clinical samples has been reported as 0.91, and for non-clinical samples, it was 0.89 (Siddiqui & Shah, 1997). Siddiqui-Shah Depression Scale correlates significantly with Zung's depression scale with 0.55, and it also correlates significantly with 'psychiatric ratings of depression with 0.40 (Siddiqui & Shah, 1997). Higher scores on this scale reflect higher levels of depression, whereas lower scores reflect either lower levels of depression or an absence thereof. In the current study, SSDS Cronbach's alpha reliability was found to be 0.83.

Death Anxiety Scale (DAS), developed by Templer (1970) and translated into Urdu by Saleem, Gul, and Saleem (2015), was used in the present study to measure death anxiety among cancer patients. This scale has 15 items and two dimensions, i.e., "true" and "false" replies. A score of 9 to 15 indicates a high level of death anxiety, scores of 4–8 indicate medium death anxiety, and less than 4 indicate no death anxiety. This scale's test-retest reliability has been reported as 0.83 and Cronbach's alpha coefficient as .76, demonstrating a reasonable internal consistency (Templer, 1970). In the current study, DAS Cronbach's alpha reliability was found to be 0.85.

Research Procedure

Purposive sampling technique was used to collect the data. Initially, the study proposal was submitted to the departmental research committee. After the approval from the committee, it was submitted to the Institutional Review Board (IRB), Government College University, Faisalabad, for final approval. After that, permission was taken from the hospitals' authorities, and data was collected. In addition to the written information on the informed consent form, one of the researchers (collecting data) briefly described the study's objectives and the benefits to the participants. The same researcher also made it verbally clear to the participants that their participation in the study was purely voluntary. Patients were referred to the data collecting researcher by the hospital's on-duty oncologist, and the researcher enrolled the participants and screened them further. One researcher collected the data from Faisalabad, and the other one collected the data from Lahore. The study data was completed in 6–8 months.

Ethical Consideration

All the researchers took care of the rights of the participants during the data collection by keeping them well-informed. Researchers asked the patients to read the consent form carefully and then sign it/put their initials on it if they are willing to participate in the study. Further, the data collecting researcher briefed each participant that they may quit the study without hesitation if they felt any discomfort. The researchers also assured the participants that their information would be kept confidential and that their identity will never be disclosed to anyone. Two of the core ethical principles borne in mind by the data collecting researchers were: 1) to look after patients' rights and 2) to care for their dignity and respect. The current study was approved by the Institutional Review Board (IRB), Government College University Faisalabad and was given the registration identification of 'Ref. No. GCUF/ERC/1985'.

Statistical Analysis

Descriptive statistics were used to see a summarized overall statistical view of the demographic data of participants. Further, ANOVA and mediation analysis were used to calculate the findings.

Results

Table 1 *Participants Demographic Characteristics*

Demographic Variables	*Categories*	*Frequency*	*Percent*	*Cumulative %*
Gender	Male	100	50	50
	Female	100	50	100
Marital Status	Single	60	29.5	29.5
	Married	94	47.0	76.5
	Divorced	28	14.5	91
	Widow	18	9.0	100
Education	Illiterate	44	21.5	21.5
	Primary	28	14.0	35.5
	Middle	39	19.3	54.8
	High School	44	23.0	77.8
	College	45	22.3	100
Residence	Rural	75	37.5	37.5
	Urban	125	62.5	100
House	Own	129	64.5	64.3
	Rent	71	35.5	100
Employment	Employed	73	36.5	36.5
	Unemployed	98	49.0	85.8
	Retired	29	14.5	100
Monthly	10,000 - 20,000	60	30.0	29.8
Income	20,000 - 40,000	65	32.5	61.5
	40,000 - 60,000	45	23.5	84.8
	60,000 - 80,000	30	15.0	100
Type of cancer	Carcinoma	56	28.0	28
	Sarcoma	26	13.0	41
	Leukemia	42	21.0	62
	Lymphomas	50	25.0	87
	Myelomas	26	13.0	100
Stage of cancer	Stage I	24	12.0	12
	Stage II	54	27.0	39
	Stage III	66	33.0	72
	Stage IV	56	28.0	100

Caregivers	Parents	62	31.0	31
	Siblings	42	21.0	52
	Family (Spouse)	96	48.0	100
Types of	Surgery+ Chemo	110	55.0	55
treatments	Radio+ Chemo	90	45.0	100

Table 2 Post-hoc (Tukey) comparisons for significant differences in depression and stages of cancer among cancer patients

Tukey test	Mean difference (SE)	p	95% confidence interval	
			Lower bound	High bound
Stage I Vs. Stage II	-18.20(1.41)	<.000	-21.88	-14.52
Stage I Vs. Stage III	-30.50(1.37)	<.000	-34.07	-26.92
Stage I Vs. Stage IV	-46.04(1.41)	<.000	-49.70	-42.39
Stage II Vs. Stage I	18.20(1.41)	<.000	14.52	21.88
Stage II Vs. Stage III	-12.29(1.06)	<.000	-15.04	-9.54
Stage II Vs. Stage IV	-27.84(1.10)	<.000	-30.70	-24.98
Stage III Vs. Stage I	30.50(1.37)	<.000	26.92	34.07
Stage III Vs. Stage II	12.29(1.06)	<.000	9.54	15.04
Stage III Vs. Stage IV	-15.54(1.05)	<.000	-18.27	-12.82
Stage IV Vs. Stage I	46.04(1.41)	<.000	42.39	49.70
Stage IV Vs. Stage II	27.84(1.10)	<.000	24.98	30.70
Stage IV Vs. Stage III	15.54(1.05)	<.000	12.82	18.27

Findings (Table 2) indicate that the level of depression among cancer patients increases as the stage of illness increases. The patients with stage-I cancer were found to be significantly different in the level of depression compared to stage-II, III, and IV.

Table 3 Post-hoc (Tukey) comparisons for significant differences in death anxiety and stages of cancer among cancer patients

Tukey test	Mean difference (SE)	p	95% confidence interval	
			Lower bound	High bound
Stage I Vs. Stage II	-.58(.42)	>.525	-1.69	.52
Stage I Vs. Stage III	-.94(.41)	>.107	-2.02	.13
Stage I Vs. Stage IV	-2.70(.42)	<.000	-3.80	-1.59
Stage II Vs. Stage I	.58(.42)	>.525	-.52	1.69
Stage II Vs. Stage III	-.36(.32)	>.668	-1.19	.46
Stage II Vs. Stage IV	-2.11(.33)	<.000	-2.98	-1.25
Stage III Vs. Stage I	.94(.41)	>.107	-.13	2.02
Stage III Vs. Stage II	.36(.32)	>.668	-.46	1.19
Stage III Vs. Stage IV	-1.75(.33)	<.000	-2.57	-.93
Stage IV Vs. Stage I	2.70(.42)	<.000	1.59	3.80
Stage IV Vs. Stage II	2.11(.33)	<.000	1.25	2.98
Stage IV Vs. Stage III	1.75(.31)	<.000	.93	2.57

The (Table 3) findings indicate the difference in the death anxiety variable in association with cancer stages. A significant difference was found between stage-I cancer and stage-IV cancer patients, while there were no significant differences found among stage-I, II, and III cancer patients on the variable of death anxiety.

Table 4 Post-hoc (Tukey) comparisons for significant differences in depression and socioeconomic status among cancer patients

Tukey test	Mean Difference	Std. Error	p	95% Confidence Interval	
				Lower Bound	Upper Bound
Low versus Middle	15.85	1.38	<.000	12.58	19.11
Low versus High	31.97	1.31	<.000	28.86	35.08
Middle versus Low	-15.85	1.38	<.000	-19.11	-12.58
Middle versus high	16.12	1.50	<.000	12.57	19.66
High versus Low	-31.97	1.31	<.000	-35.08	-28.86
High versus Middle	-16.12	1.50	<.000	-19.66	-12.57

Further findings reveal that depression was found to be higher among cancer patients of low socioeconomic status as compared to middle and high socioeconomic status on the variable of depression and similarly, a significant difference was found between middle and high socioeconomic status (Table 4).

Table 5 Post-hoc (Tukey) comparisons for significant differences in death anxiety and types of cancer among cancer patients

Tukey test	Mean Difference	Std. Error		95% Confidence Interval	
			p	Lower Bound	Upper Bound
Carcinoma versus sarcoma	2.37	.42	<.000	1.20	3.53
Carcinoma versus leukemia	.15	.36	>.993	-.84	1.15
Carcinoma versus lymphoma	1.03	.34	<.026	.08	1.99
Carcinoma versus melanoma	2.06	.42	<.000	.89	3.23
Sarcoma versus carcinoma	-2.37	.42	<.000	-3.53	-1.20
Sarcoma versus leukemia	-2.21	.44	<.000	-3.44	-.98
Sarcoma versus lymphoma	-1.33	.43	<.020	-2.52	-.14
Sarcoma versus melanoma	-.30	.49	>.972	-1.67	1.05
Leukemia versus carcinoma	-.15	.36	>.993	-1.15	.84
Leukemia versus sarcoma	2.21	.44	<.000	.98	3.44
Leukemia versus lymphoma	.88	.37	>.130	-.14	1.91
Leukemia versus melanoma	1.90	.44	<.000	.68	3.13
Lymphoma versus carcinoma	-1.03	.34	<.026	-1.99	-.08
Lymphoma versus sarcoma	1.33	.43	<.020	.14	2.52
Lymphoma versus leukemia	-.88	.37	>.130	-1.91	.14
Lymphoma versus melanoma	1.02	.43	>.127	-.16	2.21
Melanoma versus carcinoma	-2.06	.42	<.000	-3.23	-.89
Melanoma versus sarcoma	.30	.49	>.972	-1.05	1.67
Melanoma versus leukemia	-1.90	.44	>.000	-3.13	-.68
Melanoma versus lymphoma	-1.02	.43	>.127	-2.21	.16

Findings indicate that the level of death anxiety was found to be significantly different in different types of cancers among the sample (Table 5). Patients with carcinoma cancers were found to be significantly different on the variable of the death anxiety as compared to patients with sarcoma, lymphoma and melanoma cancers.

Table 6 *Pearson Product Moment Correlation Analysis examining the Correlation among Demographic Variables and Study Variables (N = 200)*

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1.Age	-	-.28***	-.19**	.15*	.10	-.29***	-.19**
2.Gender			-.02	.23**	.03	.17*	.29***
3.Residence				-.17*	-.05	.23**	-.16*
4.Religiosity					.48***	-.49***	.08
5.Optimisim						-.57***	-.32***
6.Depression							.44***
7.Death Anxiety							-
M				27.00	11.24	60.04	9.81
SD				3.96	2.22	15.72	1.98

Note. Age, 1 = 18 – 45, 2 = 46-80, Gender, 1 = Men, 2 = Women, Residence, 1 = Rural, 2 = Urban

**p< .05, **p<.01, ***p<.001*

As shown in Table 6, the age of the participants has a significant positive correlation with Muslim religiosity, whereas it has a significant negative correlation with depression and death anxiety. It can be noted that gender positively correlates with Muslim religiosity, depression, and death anxiety, indicating that women scored high on Muslim religiosity, depression, and death anxiety. The residence was also significantly negatively correlated with Muslim religiosity and death anxiety, which depicted that people who are residents of the urban area had less Muslim religiosity and death anxiety. In comparison, Muslim religiosity was found to be significantly positively correlated with optimism, while it was found to be negatively significantly associated with depression. Moreover, optimism was found to be significantly negatively correlated with depression and death anxiety, whereas depression was found to be significantly negatively correlated with death anxiety.

Mediation analysis was carried out to investigate the mediating role of Muslim religiosity and death anxiety between Muslim religiosity and death anxiety in cancer patients, using *PROCESS* macro (Coutts, Hayes, & Jiang, 2019).

Table 7 *Mediation Analysis between Muslim Religiosity and Death Anxiety through Optimism and Depression in Cancer Patients (N=200)*

Predictors	Optimism			Depression			Death Anxiety		
	Coeff.	*SE*	*p*	*Coeff.*	*SE*	*P*	*Coeff.*	*SE*	*P*
Constant	3.88	1.21	.002	100.91	7.83	.001	4.08	1.46	.006
Religiosity	.50	.04	.001	-.51	0.24	.001	.40	0.04	.001
Optimism							-.22	0.06	.003
Depression							.52	0.01	.001
Covariates									
Age	.01	.20	.877	-.12	1.31	.051	-.10	.16	.113.
Gender	-.08	.30	.218	.26	1.96	.001	.08	.25	192
Residence	.03	.29	.610	.13	1.86	.031	-.24	.23	.001
	$R^2_{=}$ .239			$R^2_{=}$ .357			$R^2_{=}$ .414		
	$F(4,195) = 15.27, p < .001$			$F(4,195) = 27.09, p < .001$			$F(6, 193) = 22.68, p < .001$		

The result of direct effect showed that Muslim religiosity was found to be a significant positive predictor of optimism and death anxiety. In contrast, it was found to be a significant negative predictor of depression. Optimism was found to predict death anxiety significantly negatively. At the same time, depression was also found to be a significant positive predictor of death anxiety.

Table 8 Indirect Effects of Optimism and Depression *between Muslim Religiosity* and *Death Anxiety in Cancer Patients* (N=200)

Mediator	*Effect*	*Boots*	*95%BootCI*	
			BootLL	*boot*
Optimism	-.27	.07	-.41	-.15
Depression	-.11	0.04	-.18	-.03

Note. Effect = standardized regression coefficient, BootCI = bootstrapped confidence interval, BootLL = bootstrapped lower limit, BootUL = bootstrapped upper limit

Results of indirect effect showed that optimism and depression were significant mediators between Muslim religiosity and death anxiety. Further, it showed that an increase in Muslim religiosity tends to increase optimism, while an increase in optimism, in turn, decreases death anxiety. Whereas the increase in Muslim religiosity tends to increase depression, and depression, in turn, increases death anxiety. The evidence of mediation analysis showed that it was a full mediation, as showed in Figure 1.

Discussion

The current study's findings show a significant mediating role of depression and optimism between Muslim religiosity and death anxiety among cancer patients. These findings are consistent with findings of previous studies (Ens & Bond,

2007; Jong et al., 2018). Religious beliefs lead to optimistic attitudes, which decreases death anxiety and depression among cancer patients (Ahmad & Gaber, 2019). Commonly, the cancer patients start negative thinking about their illness, and they frequently feel that they can die at any time while some of them think that they no longer have the life that they used to have before; this fear of death leads to many psychological problems (Nadi & Ghahremani, 2014).

Cancer is a life-threatening illness, but it becomes more troublesome when patients feel helpless, lose interest in life, and assume their lives will end soon. This attitude makes them feel vulnerable, and when a person feels vulnerable psychologically, the illness becomes worst, thereby significantly affecting his/her physical health (Naughton & Weaver, 2014). Hence, some cancer patients perceive high fears of death, and the rest of them feel depressed. As per literature, it has been observed in oncology wards that more religious cancer patients were less likely to be anxious about death than those who were less religious (Ellison et al., 2008). Usually, cancer patients have some common fears: fear of death, fear of pain, and fear of loss of functions and control (Baljani et al., 2013).

The current research findings show a more significant contribution of religiosity in a patient's psychological well-being during their cancer treatment. Positive religious thinking reduces the fear of death and gives more confidence to patients to fight against the illness. The person feels hopeful, follows experts' instructions, pursues his/her treatment procedures, and feels stronger. Findings in a similar vein suggest that religious attitude increases a person's level of optimism (Salehi et al., 2017). Moreover, it is already known that a patient feels more optimistic and perceives less fear of death because of an optimistic attitude which makes the person more psychologically strong (Mehri et al., 2017; Roshani, 2012). Furthermore, the current study also found that stronger religious beliefs somewhat act as a barrier against depression, whereas weaker religious beliefs increase the severity of depression. Similarly, it has been noted that religiosity reduces depression in cancer patients, and in turn, depression could negatively affect physical health (Aukst-Margetić et al., 2002; Ballenger et al., 2001).

Cancer patients are often increasingly susceptible to having low mood, fatigue, less energy, depression, and a lack of interest and motivation in daily activities (Haghighi, 2013). When these symptoms develop in cancer patients, they significantly affect their daily functioning and physical health. Usually, the chance of the cancer invasion becomes higher when the patient feels physically weaker (Naughton & Weaver, 2014). Patients' involvement in religious activities pushes the patients to be mobilized and be active in daily routines; the person feels energetic and better after doing some religious tasks (Alcorn et al., 2010). Therefore, religious activities play an effective role in patients' daily lives and significantly impact cognition, affect, motivation, and behavior (Jong et al., 2018). Patients allied with high religious activity experience significantly less depression (Ellison, et al., 2008). Similarly, the current study's findings show that high Muslim religiosity is a predictor of greater optimism; it can be said that Muslim religiosity leads towards optimism.

It was found in the current study that low income is one of the significant factors behind depression in cancer patients. From the literature, it was noted that it happens for various reasons; for example, in Pakistan, there are few hospitals and few treatment opportunities for cancer patients; furthermore, such facilities are largely ill-equipped (Bhurgri, 2004). On the other hand, the country's allotted resources and facilities for its cancer-struck citizens are extremely inadequate (Khaliq et al., 2019). This inadequacy creates a sense of crisis in poor cancer patients when they think they have meager income, which is not even sufficient for managing their household, hence affording cancer treatment expenses becomes extremely difficult for them (Edmondson et al., 2008).

Another finding of the present study is that the depression level was high in patients diagnosed with stage IV cancer than stage I, II, and III; this shows that patients in the last stage of cancer perceive a higher degree of hopelessness and feel more depressed. A higher degree of hopelessness and depression could be because, most of the time, they think about their deteriorating health condition and changes in their body which usually happen at the last stage of cancer because of the body becoming less tolerant and weaker due to treatment modalities, i.e., chemotherapy, radiation, and

drugs (Braam et al., 2001). Furthermore, cancer medications can give rise to some side effects which significantly affect a patient's mood and cause mood irritation (Schubert & Hagen, 2018). These phenomena described above can also exhibit depressive symptoms, which decrease an individual's well-being; sometimes, depressive symptoms increase cancer severity because the patient mentally perceives himself/herself as incurable (Rajandram et al., 2011).

Further, the present study's findings indicate that fear of death increases in cancer patients when their severity of illness increases. In our sample, the death anxiety level was high as the stage of the disease progressed, i.e., from stage-I to IV, and at stage-IV, patients had a high score on the death anxiety scale. As per literature, fear of death gradually changes to various psychological problems such as low mood, isolation, irritability, and hopelessness (Schubert & Hagen, 2018). When the fear intensity increases, the individual feels more worried and anxious about health conditions creating negative beliefs which gradually cause cognitive distortion (Vilhuer, 2008).

As per findings of the present study, physical and psychosocial variables, such as functional status, stress, depression, and anxiety, played a greater role at the period of initial cancer detection and its treatment than optimism in cancer patients. Highly optimistic patients experienced less stress before and after the diagnosis of cancer as compared to pessimistic patients. Optimism seems to have a supportive effect during psychological stress, and it can be a valuable tool in reducing stressful incidents of life such as cancer. Similar findings have been noted by Shaheen et al (2014).

Limitations and recommendations

The current study was conducted on patients with only a few cancers; if other types of cancers are included, the findings will be more generalizable. Further, in this study, the patients with comorbidity illness were excluded; their inclusion in further studies will also help produce richer results. In the current study, participants were recruited during chemotherapy only. The findings might differ among patients in the screening process (before the chemotherapy starts) or in the recovery phase after chemotherapy treatment. In addition, participants were young cancer adults, and the results may not apply to older adults. This study does not consider whether the patients are diagnosed with cancer for the first time or have a re-occurrence of the disease so that subsequent studies could find differences in this vein. This study does not give any direction about the emotional problems or religious orientation of the family members of the cancer patients. Further study could be a significant area needing exploration as family members of cancer patients also face extreme duress during this critical phase when their loved one is fighting against cancer.

Implications of the study

A cancer diagnosis is a threatening phenomenon. It creates some form of fear of death and leads to emotional disturbances reflected in the form of low motivation, sadness, and hopelessness, which, in turn, could result in adverse health outcomes. One of the significant implications of the study is that caregivers should provide sufficient support to cancer patients in performing their religious activities. This support could be in the form of a religious scholar guiding them towards supplications and other such rituals that highlight optimism and safeguard them against despair. Another implication of the study is that we should apply counseling and psychoeducational programs to cancer patients in line with their religious practices to create awareness about how they cope with problems. It will help the patients to develop hopefulness to increase their functioning by involving them in religious activities.

Conclusion

It is concluded that Muslim religiosity significantly associates with optimism, and optimism correlates with death anxiety. Further, there is a significant negative relationship between Muslim religiosity and depression; at the same time, depression substantially mediates death anxiety among cancer patients. Optimism and depression are substantial mediators between Muslim religiosity and death anxiety among cancer patients.

Declarations

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Compliance with Ethical Standards

Disclosure of potential conflicts of interest: All authors declare that they have no conflicts of interest.

Research involving human participants and/or animals: All ethical research procedures were followed in the study involving human participants. The study was started after the permission of the university Board of Advance Studies and Research.

Informed consent: The data collecting researcher explained the research and the rights of the participants to them, both verbally and through the informed consent form. Those participants who showed a willingness to participate in the study were asked to sign the consent form. Participants who signed the consent form were included in the study.

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Figures

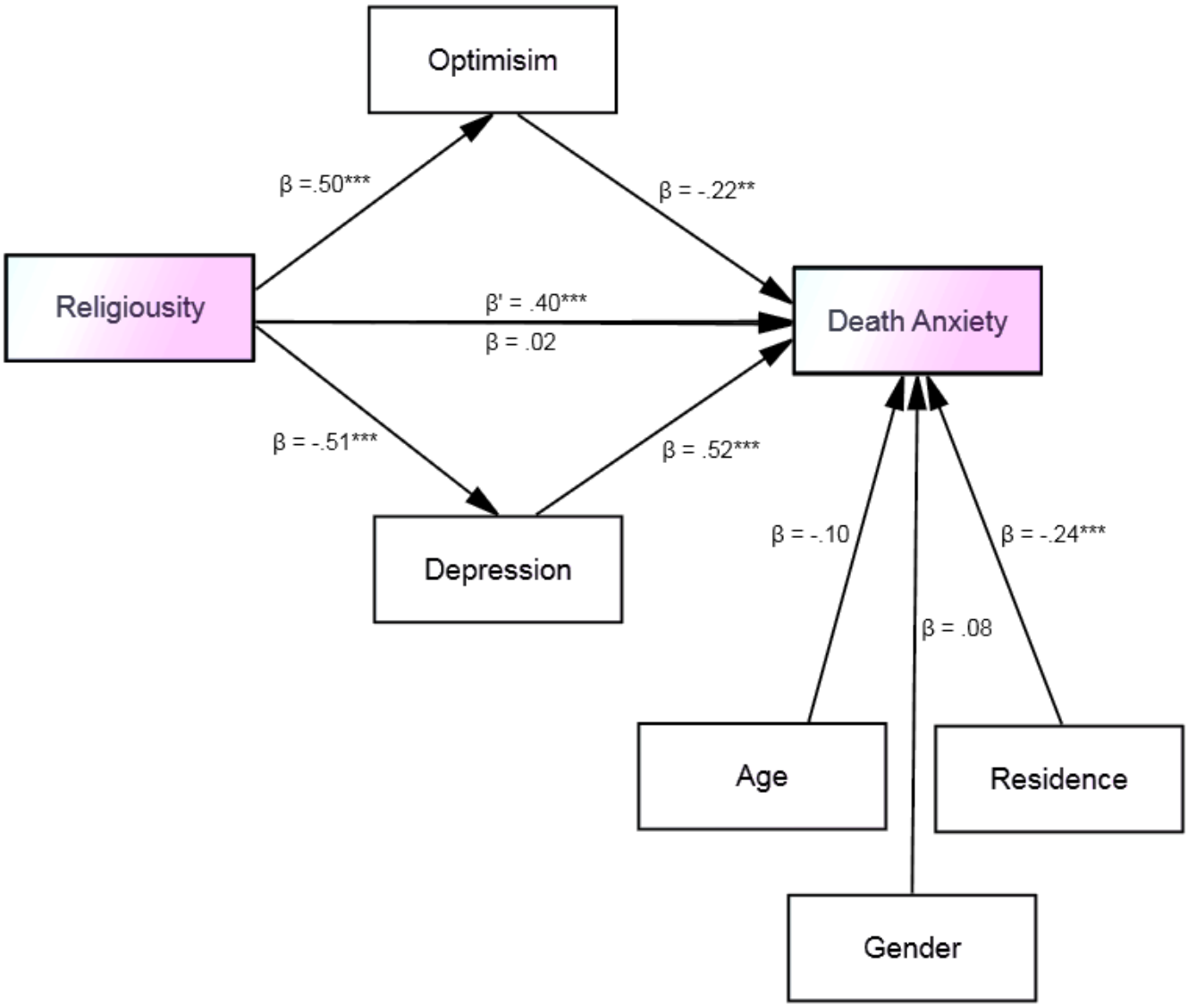

Figure 1

The Statistical Model of Mediation Analysis