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Role of Religiosity in Moderating the Relationship Between Anxiety, Depression, and Quality of Life in Women With Gynaecological Cancers

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Abstract

Introduction: Women with gynaecological malignancies frequently experience psychological distress and impaired health-related quality of life (QOL). Religiosity may represent a culturally relevant psychosocial resource influencing the relationship between psychological symptoms and well-being. This study aimed to examine the associations among depression, anxiety, religiosity, and QOL and to evaluate whether religiosity moderated the relationship between psychological distress and QOL among women with gynaecological cancers.

Methods: This hospital-based, cross-sectional observational study included 50 women with histopathologically confirmed gynaecological malignancies recruited through consecutive sampling between September 2024 and August 2025. Depressive symptoms, anxiety symptoms, health-related QOL, and religiosity were assessed using the 21-item Hamilton Depression Rating Scale (HAM-D21), Hamilton Anxiety Rating Scale (HAM-A), Functional Assessment of Cancer Therapy-General (FACT-G), and 15-item Centrality of Religiosity Scale (CRS-15), respectively. Spearman's rank correlation analysis was performed to evaluate associations among study variables. Hierarchical multiple linear regression with interaction terms was used to examine the potential moderating association of religiosity with depression-related and anxiety-related QOL.

Results: The mean age of participants was 55.24 ± 5.56 years. Depressive and anxiety symptom classifications were recorded in 17 (34%) and 20 (40%) participants, respectively. Depression ($r_s = -0.667$, $p < 0.001$) and anxiety ($r_s = -0.759$, $p < 0.001$) demonstrated significant negative correlations with QOL. Religiosity was negatively correlated with depressive symptoms ($r_s = -0.298$, $p = 0.035$) and anxiety symptoms ($r_s = -0.395$, $p = 0.005$) and positively correlated with overall QOL ($r_s = 0.399$, $p = 0.004$). Hierarchical regression identified a statistically significant depression-religiosity interaction ($B = 0.101$, $\beta = 0.307$, $p = 0.008$), which increased the explained variance in QOL by 8.4 percentage points ($\Delta R^2 = 0.084$). The final regression model explained 49.6% of the variance in QOL ($R^2 = 0.496$). The negative association between depressive symptom severity and QOL was attenuated at higher religiosity scores. A statistically significant anxiety-religiosity interaction was not demonstrated.

Conclusion: Higher religiosity was associated with lower psychological symptom scores and better health-related QOL among women with gynaecological malignancies. Religiosity also demonstrated a significant statistical moderating association with depression-related QOL but not with anxiety-related QOL. These findings suggest that consideration of individual religious beliefs and coping preferences may be relevant to culturally sensitive psychosocial oncology care. Larger longitudinal studies are required to validate the observed relationships and clarify their potential clinical implications.

Categories: Obstetrics/Gynecology, Psychiatry, Oncology
Keywords: anxiety, depression, gynecological cancer, health-related quality of life, moderation analysis, psychological distress, psycho-oncology, psychosocial oncology, religiosity, religious coping

Introduction

Globally, cancer remains one of the leading causes of morbidity and mortality. According to GLOBOCAN 2022 estimates, approximately 20 million new cancer cases were reported worldwide, compared with 14.1 million in 2012 [1,2]. The global cancer burden is projected to increase substantially, with an estimated 77% rise in new cases by 2050 [3]. Gynaecological malignancies, including cervical, ovarian, uterine, vulvar, and

vaginal cancers, account for a substantial proportion of cancers affecting women [4]. Advances in early detection, diagnostic techniques, and therapeutic interventions have improved survival outcomes among patients with gynaecological cancers [5-7]. Consequently, the focus of cancer care has progressively expanded beyond prolonging survival to improving health-related quality of life (QOL).

Women diagnosed with gynaecological cancers experience numerous physical, psychological, social, and existential challenges throughout their illness and treatment. In addition to cancer-related symptoms and treatment-associated adverse effects, these patients frequently encounter premature menopause, hormonal disturbances, sexual dysfunction, altered body image, concerns regarding femininity and fertility, and social stigma. Such experiences increase vulnerability to psychiatric morbidity, particularly depression and anxiety. Psychological distress may adversely affect emotional well-being, interpersonal relationships, functional capacity, treatment adherence, self-care, and overall QOL [8]. Identifying potentially modifiable psychosocial factors that influence psychological adjustment and QOL is therefore an important component of comprehensive gynaecological oncology care.

Religion and spirituality represent important dimensions of individual identity, particularly when individuals face life-threatening illnesses. Growing interest in psycho-oncology has encouraged investigations into the relationship between religious beliefs, spiritual well-being, psychological distress, and QOL among patients with cancer. Religious engagement may provide emotional comfort, hope, meaning, and a sense of purpose during cancer diagnosis and treatment. Activities such as prayer, meditation, participation in religious practices, and engagement with religious communities have been associated with psychological well-being and adaptive coping in patients with cancer [9]. Spiritual well-being has also been examined in relation to symptom burden, psychological adjustment, and recovery from illness [10,11]. However, existing research examining the relationships among religiosity, spirituality, depression, anxiety, and QOL has produced varying findings across clinical populations [12].

Although considerable progress has been achieved in developing effective oncological treatments, comparatively less attention has been directed towards identifying culturally appropriate psychosocial resources that may improve patients' QOL. Depression and anxiety are important contributors to impaired well-being among patients with cancer, making it necessary to examine factors that may reduce the adverse association between psychological distress and QOL. Religiosity may be particularly relevant in India, where religious beliefs, rituals, and community participation are closely integrated into everyday social and cultural life. For many individuals, religious practices constitute accessible sources of emotional reassurance, social support, and coping during serious illness.

An important distinction exists between the direct association of religiosity with QOL and its potential moderating effect on the relationship between psychological distress and QOL. Religiosity may not independently determine psychological well-being but may modify the extent to which depressive or anxiety symptoms are associated with impaired functioning and overall QOL. Understanding this potential moderating role could provide additional insight into the mechanisms through which religious beliefs and practices relate to psychological adjustment among patients with cancer.

Much of the existing literature on spirituality, religiosity, and psychological well-being has originated from Western populations, potentially limiting the applicability of its findings to the Indian sociocultural context. Furthermore, relatively limited research has specifically examined religiosity as a moderator of the relationship between depression, anxiety, and QOL among women with gynaecological malignancies. This represents an important gap in psycho-oncology research, particularly in resource-constrained healthcare settings where culturally acceptable psychosocial coping resources may have practical relevance.

The present study aimed to assess the prevalence of depression and anxiety and their associations with health-related QOL among women with gynaecological cancers. It additionally evaluated the relationship of religiosity with depression, anxiety, and QOL and investigated whether religiosity moderates the association between psychological distress and QOL. The findings may contribute to a better understanding of culturally relevant psychosocial factors and inform the development of holistic, patient-centred supportive care strategies for women undergoing treatment for gynaecological malignancies.

Materials And Methods

Study design, setting, and duration

This hospital-based, descriptive, cross-sectional observational study was conducted over 12 months, from September 2024 to August 2025, among women with histopathologically confirmed gynaecological malignancies attending the outpatient and inpatient services of Raipur Institute of Medical Sciences (RIMS), Raipur, Chhattisgarh, India. Participants were recruited through consecutive, non-probability sampling during the study period. The investigation aimed to assess the relationships among depressive symptom severity, anxiety symptom severity, religiosity, and health-related QOL, with particular emphasis on examining whether religiosity statistically moderated the associations between psychological distress and QOL.

The study was observational, and no experimental intervention, religious intervention, or modification of oncological treatment was undertaken. Sociodemographic information, cancer-related clinical characteristics, and psychological assessment scores were collected for descriptive and inferential statistical analyses. The primary outcome was health-related QOL, assessed using the Functional Assessment of Cancer Therapy-General (FACT-G) total score.

Study population and eligibility criteria

The study population comprised adult women with histopathologically confirmed gynaecological malignancies, including cervical, ovarian, and uterine cancers. Participants were eligible if they had a documented diagnosis of gynaecological cancer, were clinically able to complete the required psychological and psychosocial assessments, and agreed to participate by providing written informed consent. Women who were severely ill and unable to participate meaningfully in the assessments were excluded. Patients already receiving treatment for pre-existing psychiatric disorders were also excluded to minimise potential confounding by previously established psychiatric conditions and their treatment.

The diagnosis of malignancy was based on histopathological examination and the corresponding clinical oncology records. Information regarding the primary cancer site, disease stage, and oncological treatment modality was obtained from existing clinical documentation. These characteristics were recorded for descriptive analysis; they were not assigned or modified by the investigators.

Diagnostic assessment and cancer staging

Gynaecological malignancies were identified through histopathological confirmation supported by relevant oncology records. Primary tumour sites were categorised as cervical, ovarian, or uterine according to the documented pathological diagnosis. Clinical stage was extracted from the treating oncology team's records and retained as originally documented, without retrospective reassignment by the study investigators.

The International Federation of Gynecology and Obstetrics (FIGO) provides site-specific staging frameworks for gynecological malignancies. Relevant primary staging publications include the revised 2018 FIGO cervical cancer classification published by Bhatla and colleagues in 2019, the 2014 FIGO classification of ovarian, fallopian tube, and primary peritoneal cancer reported by Prat, and the 2023 FIGO endometrial cancer staging classification published by Berek and colleagues [13-15]. These publications provide classification context; however, the specific edition used in each patient's original oncology record was not independently established by the study. Consequently, the recorded clinical stages were not retrospectively attributed to a staging edition that could not be verified.

Depressive and anxiety symptom severity was evaluated using established clinician-administered Hamilton rating instruments. These scales were used to characterise psychological symptom burden rather than independently diagnose major depressive disorder or a specific anxiety disorder. This distinction was particularly relevant because malignancy-related symptoms and oncological treatment effects may overlap with the somatic manifestations assessed by these instruments. Symptom classifications were therefore interpreted as descriptive assessment findings rather than independently verified psychiatric diagnoses.

Sampling technique and sample size

Consecutive, non-probability sampling was employed during the study period. A total of 62 women with gynaecological malignancies were approached for participation. Of these, 7 (11.3%) were excluded because they were receiving treatment for pre-existing psychiatric disorders, while 5 (8.1%) declined to participate. The final study population comprised 50 (80.6%) eligible women who provided informed consent and were included in the analysis.

All 50 enrolled participants underwent the designated assessments of depressive symptoms, anxiety symptoms, religiosity, and health-related QOL. The participants were included in a single observational cohort without allocation to treatment, control, or experimental groups. The sample was used for descriptive analysis, correlation analysis, and exploratory hierarchical multiple regression analyses.

Ethical considerations

The study was reviewed and approved by the RIMS Ethics Committee, RIMS, Raipur, Chhattisgarh, India, under approval number IEC/RIMS/2024/112, dated August 14, 2024. Ethical approval was obtained before the commencement of participant recruitment. Written informed consent was obtained from each participant before enrollment and administration of the study assessments.

Participation was voluntary, and information relating to the participants' demographic characteristics, clinical diagnoses, treatment, psychological assessment scores, and religious involvement was handled confidentially. The study involved human participants only and did not involve animal subjects. No experimental treatment or change in routine oncological management was undertaken.

Assessment instruments

Four previously published standardised instruments were used to assess depressive symptom severity, anxiety symptom severity, health-related QOL, and religiosity: the 21-item Hamilton Depression Rating Scale (HAM-D21), Hamilton Anxiety Rating Scale (HAM-A), FACT-G, Version 4, and 15-item Centrality of Religiosity Scale (CRS-15). The original developers are acknowledged through their respective primary publications, and the relevant access, copyright, and permission considerations are described below.

The assessment scores were treated as continuous variables for correlation and regression analyses. Higher Hamilton scores indicated greater psychological symptom severity, higher FACT-G scores indicated better health-related QOL, and higher CRS-15 scores indicated greater centrality of religiosity. Categorical symptom classifications were reported descriptively and were not considered substitutes for independently established psychiatric diagnoses.

HAM-D21

Depressive symptom severity was assessed using the Hamilton Depression Rating Scale, originally developed by Max Hamilton and published in 1960 [16]. The 21-item form (HAM-D21) assesses multiple depressive manifestations, including depressed mood, feelings of guilt, suicidal ideation, sleep disturbances, psychomotor changes, anxiety-related symptoms, and somatic complaints. The individual items are rated using the response categories specified for the instrument, and higher scores reflect greater depressive symptom severity.

Although the original Hamilton instrument contains 21 items, conventional depression severity scoring frequently uses the first 17 items, with the remaining items contributing supplementary clinical information. Standardised administration, rating procedures, and relevant methodological considerations have been described by Rohan and colleagues [17]. In the present study, the recorded HAM-D21 assessment scores were used to characterise depressive symptom burden. These scores were not independently considered diagnostic confirmation of major depressive disorder.

The original Hamilton Depression Rating Scale is a publicly available, public domain instrument, and permission is generally not required for use of its original form in clinical research. The original developer is cited [16], and the supplementary methodological reference is acknowledged [17]. This public domain status does not automatically apply to proprietary translations, modified versions, or separately copyrighted structured interview adaptations.

HAM-A

Anxiety symptom severity was assessed using the HAM-A, originally developed by Max Hamilton in 1959 [18]. The HAM-A is a clinician-administered, 14-item instrument designed to evaluate psychological and somatic manifestations of anxiety. It assesses symptoms, including anxious mood, tension, fears, insomnia, impaired concentration, muscular complaints, sensory manifestations, cardiovascular and respiratory symptoms, gastrointestinal and genitourinary complaints, autonomic symptoms, and observed behaviour during the assessment.

Each item is scored from 0 to 4, yielding a total score ranging from 0 to 56, with higher scores indicating greater anxiety severity. The HAM-A was used to quantify anxiety symptom burden rather than independently diagnose a categorical anxiety disorder. The original instrument development publication by Hamilton is cited [18], while subsequent investigations of its reliability, validity, and structured administration are acknowledged through references [19] and [20].

The original HAM-A has historically been distributed as a freely accessible or public domain clinical assessment instrument. However, licensing conditions may differ according to the distributor, language, format, or proprietary adaptation, and some contemporary instrument repositories identify managed copyright or licensing requirements. Accordingly, the accessibility of the original publication should not be interpreted as authorisation to use every commercially distributed or adapted version. The original version and its source must be distinguished from any separately copyrighted adaptation when determining the applicable permission requirements.

FACT-G

Health-related QOL was evaluated using Version 4 of the FACT-G, originally developed and validated by Cella and colleagues [21]. The FACT-G is a 27-item patient-reported outcome instrument comprising four domains: physical well-being (seven items), social/family well-being (seven items), emotional well-being (six items), and functional well-being (seven items). Responses are recorded using a five-point Likert scale ranging from 0 to 4, with reverse scoring performed where indicated by the official scoring instructions.

The domain scores are combined to obtain a total FACT-G score ranging from 0 to 108, with higher scores

indicating better health-related QOL. The FACT-G total score was considered the principal QOL outcome in the present study. Domain-level scores were also considered for descriptive assessment of physical, emotional, social/family, and functional well-being. The original development and validation publication is cited to acknowledge the instrument's developer [21].

FACT-G Version 4 is a copyrighted instrument belonging to the Functional Assessment of Chronic Illness Therapy (FACIT) measurement system and is not a public domain questionnaire. A study-specific, no-fee FACIT licensing agreement identifying the English-language FACT-G Version 4 and the present research study was issued through FACIT.org and electronically signed by the corresponding author. The completed agreement includes an electronic signature audit report.

The licensing agreement applies to the specified instrument, language, and study and does not authorise unrestricted modification, translation, redistribution, or publication of the questionnaire itself. The questionnaire's original copyright attribution is retained in the licensed instrument. The full copyrighted questionnaire is not reproduced within this manuscript.

CRS-15

Religiosity was assessed using the 15-item CRS-15, developed by Stefan Huber and Odilo W. Huber and described in their original publication in 2012 [22]. The instrument evaluates the centrality, importance, and salience of religious meanings, beliefs, and practices in an individual's life. It comprises five theoretically defined dimensions: intellectual engagement, ideological beliefs, public religious practice, private religious practice, and religious experience.

Each of the five dimensions is represented by three items, allowing multidimensional assessment of religious involvement. The CRS-15 was used as a continuous measure of religiosity rather than relying exclusively on religious affiliation. Higher scores were interpreted as reflecting greater centrality of religion in the participant's life.

The original publication by Huber and Huber is openly accessible in the journal Religions under a Creative Commons Attribution 3.0 license [22]. The published material may be reused subject to the applicable license conditions, including appropriate attribution to the original developers. The copyright and permission status of separately translated, modified, or independently distributed versions may differ and must be considered according to the exact form administered. The original development publication and its applicable attribution requirements are acknowledged.

Data collection procedure

Following confirmation of eligibility and receipt of written informed consent, sociodemographic and cancer-related clinical information was collected using a structured study data collection procedure. Sociodemographic variables included age, religious affiliation, educational status, occupation, marital status, family structure, residential background, and socioeconomic status. Clinical variables included the type of histopathologically confirmed gynecological malignancy, documented cancer stage, and oncological treatment modality.

The participants underwent psychological and psychosocial assessments using the HAM-D21, HAM-A, FACT-G Version 4, and CRS-15. Depression and anxiety scores were obtained through the Hamilton assessment instruments, health-related QOL was evaluated using FACT-G, and religiosity was assessed using CRS-15. Clinical staging and treatment information were extracted from the participants' oncology records.

The collected data were subsequently analyzed to investigate associations among psychological distress, religiosity, and QOL. Particular emphasis was placed on distinguishing the direct statistical association of religiosity with QOL from its potential moderating association with depression-related and anxiety-related QOL. No experimental, psychological, or religious intervention was administered as part of the investigation.

Study variables and outcome measures

The primary outcome variable was health-related QOL, represented by the FACT-G total score. Depressive symptom severity, measured using HAM-D21, and anxiety symptom severity, measured using HAM-A, constituted the principal psychological explanatory variables. Religiosity, assessed through CRS-15, was examined both as a correlate of psychological distress and QOL and as a potential statistical moderator.

The primary moderation analysis evaluated whether the relationship between depressive symptom severity and QOL varied according to the level of religiosity. A corresponding moderation analysis examined whether religiosity similarly modified the relationship between anxiety symptom severity and QOL. Secondary analyses investigated correlations among depression, anxiety, religiosity, and QOL, together with descriptive comparisons of assessment scores across selected sociodemographic and clinical categories.

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics, version 30.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics summarised the sociodemographic characteristics, clinical profiles, and psychological and psychosocial assessment scores of the study population. Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were reported as absolute frequencies and percentages (n (%)). Mean ranks were used to describe selected exploratory comparisons across sociodemographic and clinical categories.

Spearman's rank correlation analysis was employed to assess the relationships among depressive symptom severity, anxiety symptom severity, religiosity, and health-related QOL. The direction and magnitude of each association were expressed using Spearman's rank correlation coefficient (r_s), accompanied by its corresponding two-sided p-value. The correlation analyses included relationships between depression and anxiety, psychological symptoms and QOL, and religiosity with depression, anxiety, and QOL.

Hierarchical multiple linear regression was used to examine the potential moderating association of religiosity with depression-related QOL. The FACT-G total score was the dependent variable. In the initial regression model, mean-centred depressive symptom scores (HAM-D_C) and mean-centred religiosity scores (CRS_C) were entered as explanatory variables. In the second model, an interaction term representing the product of the mean-centred depression and religiosity scores (HAM-D_C × CRS_C) was added to determine whether the depression-QOL relationship varied across levels of religiosity.

A corresponding hierarchical multiple linear regression model was specified to assess anxiety-related QOL. In this analysis, the FACT-G total score remained the dependent variable. Mean-centred anxiety symptom scores (HAM-A_C) and mean-centred religiosity scores (CRS_C) were entered in the initial model, followed by the anxiety-religiosity interaction term (HAM-A_C × CRS_C) in the subsequent model.

Regression results were evaluated using unstandardised coefficients (B), standard errors (SE), standardised coefficients (β), and associated t-statistics and p-values. Overall model performance was assessed using F-statistics, model and residual degrees of freedom, the coefficient of determination (R^2), adjusted R^2, and the change in explained variance (ΔR^2) after addition of the interaction term. Where applicable and supported by the statistical output, incremental effect sizes were expressed using Cohen's f^2. The contribution of interaction terms was assessed through the corresponding regression coefficients and nested-model comparisons.

All statistical tests were evaluated using a two-sided significance threshold of $p < 0.05$. Exploratory subgroup comparisons were interpreted descriptively in the absence of their corresponding inferential test statistics. Because the study was cross-sectional and observational, statistical associations and interaction effects were not interpreted as evidence of causality or therapeutic benefit.

Results

Sociodemographic and clinical characteristics

A total of 62 women with histopathologically confirmed gynaecological malignancies were approached for participation during the study period. Of these, 7 (11.3%) were excluded because they were receiving treatment for pre-existing psychiatric disorders, while 5 (8.1%) declined to participate. Consequently, 50 (80.6%) women fulfilled the eligibility criteria, provided written informed consent, and were included in the final analysis. All enrolled participants underwent assessments of depressive symptoms, anxiety symptoms, religiosity, and health-related QOL using the designated standardised instruments.

The mean age of participants was 55.24 ± 5.56 years. Regarding religious affiliation, 46 (92%) participants were Hindu and 4 (8%) were Muslim. Educational assessment revealed that 40 (80%) participants were illiterate, 9 (18%) had completed primary education, and 1 (2%) had received secondary education. With respect to occupation, 31 (62%) women were homemakers, 16 (32%) were unskilled workers, and 3 (6%) were semi-skilled workers. Regarding marital status, 40 (80%) participants were married, and 10 (20%) were widowed. Family structure included 25 (50%) participants from joint families, 13 (26%) from extended families, and 12 (24%) from nuclear families. Most participants resided in rural areas (42 (84%)), while 8 (16%) lived in urban settings. Socioeconomic assessment demonstrated that 42 (84%) participants belonged to the lower socioeconomic group and 8 (16%) to the middle socioeconomic group.

Cervical cancer was the most frequently diagnosed gynaecological malignancy, affecting 35 (70%) participants, followed by ovarian cancer in 10 (20%) and uterine cancer in 5 (10%) participants. Regarding disease stage, 31 (62%) participants had stage IV malignancy, 17 (34%) had stage III malignancy, and 2 (4%) had stage I malignancy. Overall, 48 (96%) participants had advanced-stage disease (stage III or IV). With respect to oncological treatment, 31 (62%) participants received combined or multimodal treatment, whereas 19 (38%) received chemotherapy alone. These treatment modalities were recorded as clinical characteristics and were not assigned or modified by the investigators. The complete distribution of sociodemographic and clinical characteristics is presented in Table *1*.

Variable	Category	Value
Age (years)	Mean ± SD	55.24 ± 5.56
Religion	Hindu	46 (92%)
	Muslim	4 (8%)
Educational status	Illiterate	40 (80%)
	Primary education	9 (18%)
	Secondary education	1 (2%)
Occupation	Homemaker	31 (62%)
	Unskilled worker	16 (32%)
	Semiskilled worker	3 (6%)
Marital status	Married	40 (80%)
	Widowed	10 (20%)
Family type	Nuclear	12 (24%)
	Extended	13 (26%)
	Joint	25 (50%)
Residential background	Rural	42 (84%)
	Urban	8 (16%)
Socioeconomic status	Lower	42 (84%)
	Middle	8 (16%)
Type of gynaecological cancer	Cervical	35 (70%)
	Ovarian	10 (20%)
	Uterine	5 (10%)
Cancer stage	Stage I	2 (4%)
	Stage III	17 (34%)
	Stage IV	31 (62%)
Treatment modality	Chemotherapy alone	19 (38%)
	Combined/multimodal treatment	31 (62%)

TABLE 1: Sociodemographic and clinical characteristics of the study population (N = 50)

Sociodemographic and clinical characteristics of 50 women with histopathologically confirmed gynaecological malignancies. Categorical variables are expressed as absolute frequencies and percentages (n (%)), calculated using the total study population (N = 50). Age is presented as mean ± standard deviation (SD). Cancer stage and treatment modality were extracted from clinical records. No inferential statistical tests were performed.

Prevalence and distribution of depression and anxiety

Psychological and psychosocial assessments were completed for all 50 women with gynaecological malignancies. The mean HAM-D21 score was 16.80 ± 8.22, while the mean HAM-A score was 14.82 ± 6.70. Depressive symptom classifications were recorded in 17 (34%) participants, whereas anxiety symptom classifications were recorded in 20 (40%) participants. These classifications reflect symptom burden according to the assessment procedures and should not be interpreted as independently confirmed psychiatric diagnoses.

Descriptive comparison of depressive symptom severity across sociodemographic categories revealed relatively higher mean ranks among participants with formal education (30.05), widowed women (28.65), women belonging to nuclear families (33.35), and urban residents (31.63). These observations indicate

variation in the distribution of depressive symptom scores across educational, marital, family, and residential categories. However, the observed mean ranks alone do not establish statistically significant differences or independent associations between these characteristics and depressive symptom severity.

Analysis of depressive symptom severity according to cancer stage demonstrated a higher mean rank among participants with stage IV malignancy (26.68) than among those with stage I disease (16.75). This descriptive pattern suggested relatively greater depressive symptom burden among participants with advanced malignancy. Interpretation was limited by the unequal distribution of cancer stages, particularly the small number of participants with stage I disease (2 (4%)) compared with stage IV disease (31 (62%)). These descriptive comparisons were therefore not considered evidence of a statistically established relationship between cancer stage and depressive symptom severity.

Comparison of anxiety symptom severity across sociodemographic categories similarly demonstrated relatively higher mean ranks among women with formal education (42.00), widowed participants (30.05), and women belonging to nuclear families (32.00). These findings represent descriptive differences in the distribution of anxiety symptom scores across the assessed categories. As the corresponding inferential test statistics were not established from the summarised results, statistical significance was not attributed to these observations.

Health-related QOL

Health-related QOL was assessed among the 50 women using Version 4 of the FACT-G. The mean FACT-G total score was 51.12 ± 16.82 on a scale ranging from 0 to 108, with higher scores indicating better health-related QOL. Among the assessed domains, social/family well-being demonstrated a mean score of 14.66 ± 4.50 on a domain-specific scale ranging from 0 to 28. These findings characterise the overall QOL and social/family well-being of the study population.

Descriptive comparisons of QOL scores across sociodemographic and clinical categories revealed relatively higher mean ranks among participants without formal education (27.59) and married women (26.13). Participants with stage IV gynaecological malignancy demonstrated a mean rank of 24.92 for QOL. These variations were considered descriptive observations rather than evidence of statistically significant differences because the corresponding inferential test statistics were not established from the reported summaries.

Correlation between depression, anxiety, religiosity, and QOL

Spearman's rank correlation analysis was performed to examine the relationships among depressive symptom severity, anxiety symptom severity, religiosity, and health-related QOL. A strong positive correlation was observed between depression and anxiety scores ($r_s = 0.883$, $p < 0.001$), indicating that higher depressive symptom scores were associated with higher anxiety symptom scores.

Depressive symptom severity demonstrated a statistically significant negative correlation with overall QOL ($r_s = −0.667$, $p < 0.001$). Similarly, anxiety symptom severity demonstrated a statistically significant negative correlation with QOL ($r_s = −0.759$, $p < 0.001$). These findings indicated that greater depressive and anxiety symptom burden was associated with lower patient-reported QOL scores.

Religiosity demonstrated statistically significant negative correlations with depressive symptom severity ($r_s = −0.298$, $p = 0.035$) and anxiety symptom severity ($r_s = −0.395$, $p = 0.005$). In contrast, religiosity was positively correlated with overall QOL ($r_s = 0.399$, $p = 0.004$). Domain-specific analyses also demonstrated negative correlations between depressive symptom severity and functional well-being ($r_s = −0.630$) and between anxiety symptom severity and emotional well-being ($r_s = −0.693$). These domain-specific findings were considered descriptive because corresponding significance tests were not documented in the summarised results.

The mean assessment scores and complete correlation matrix for the four principal study variables are presented in Table *2*.

Assessment instrument	Mean ± SD	HAM-D21	HAM-A	FACT-G	CRS-15
HAM-D21	16.80 ± 8.22	1.000 (NA)	0.883 (p < 0.001)	−0.667 (p < 0.001)	−0.298 (p = 0.035)
HAM-A	14.82 ± 6.70	0.883 (p < 0.001)	1.000 (NA)	−0.759 (p < 0.001)	−0.395 (p = 0.005)
FACT-G	51.12 ± 16.82	−0.667 (p < 0.001)	−0.759 (p < 0.001)	1.000 (NA)	0.399 (p = 0.004)
CRS-15	49.76 ± 9.05	−0.298 (p = 0.035)	−0.395 (p = 0.005)	0.399 (p = 0.004)	1.000 (NA)

TABLE 2: Assessment scores and Spearman's rank correlations among depression, anxiety, quality of life, and religiosity (N = 50)

Assessment scores are expressed as mean ± standard deviation (SD). Statistical associations were evaluated using Spearman's rank correlation test, with the Spearman correlation coefficient (r_s) serving as the test statistic. Correlation cells present the correlation coefficient followed by its corresponding two-sided p-value in parentheses. Diagonal entries represent self-correlations, for which significance testing is not applicable (NA). The significance threshold was $p < 0.05$.

CRS-15, 15-item Centrality of Religiosity Scale; HAM-A, Hamilton Anxiety Rating Scale; HAM-D21, 21-item Hamilton Depression Rating Scale; FACT-G, Functional Assessment of Cancer Therapy-General.

Religiosity and its association with psychological distress and QOL

Religiosity was assessed among the 50 women with gynaecological malignancies using the CRS-15. The mean religiosity score was 49.76 ± 9.05, with observed scores ranging from 30 to 68. Descriptive analysis demonstrated relatively higher mean religiosity scores among Hindu participants (50.33 ± 8.73), women without formal education (50.88 ± 8.75), rural residents (50.26 ± 9.41), and participants belonging to lower socioeconomic groups (50.62 ± 9.27). These descriptive variations were not interpreted as statistically established between-group differences.

The correlation analyses demonstrated that greater religiosity was associated with lower depressive and anxiety symptom severity and higher overall QOL. The observed associations were consistent across the principal psychological and psychosocial variables, although the strength of the correlations varied. These relationships are presented in Table *2* and were interpreted as statistical associations rather than evidence of a causal protective effect of religiosity.

Moderating effect of religiosity on the relationship between depression and QOL

Hierarchical multiple linear regression analysis was conducted to examine whether religiosity statistically moderated the association between depressive symptom severity and health-related QOL. The FACT-G total score was considered the dependent variable, while mean-centred HAM-D21 and CRS-15 scores were entered as explanatory variables.

In Model 1, mean-centred depressive symptom severity (HAM-D_C) and religiosity (CRS_C) were entered as independent predictors. The model was statistically significant ($F(2,47) = 16.468$, $p < 0.001$), accounting for 41.2% of the variance in QOL ($R^2 = 0.412$, adjusted $R^2 = 0.387$). Depressive symptom severity demonstrated a statistically significant negative association with QOL ($B = -1.142$, $SE = 0.235$, $\beta = -0.559$, $t \approx -4.86$, $p < 0.001$), whereas the independent association of religiosity with QOL was not statistically significant ($B = 0.393$, $SE = 0.214$, $\beta = 0.212$, $t \approx 1.84$, $p = 0.072$).

In Model 2, an interaction term representing the product of mean-centred depression and religiosity scores (HAM-D_C × CRS_C) was incorporated into the regression equation. The expanded model remained statistically significant ($F(3,46) = 15.073$, $p < 0.001$), explaining 49.6% of the variance in QOL ($R^2 = 0.496$, adjusted $R^2 = 0.463$). The addition of the depression-religiosity interaction term increased explained variance by 8.4 percentage points ($\Delta R^2 = 0.084$). The approximate nested-model test statistic was F-change $(1,46) \approx 7.67$, with a reported interaction p-value of 0.008. The incremental effect size was approximately Cohen's $f^2 = 0.167$, calculated from the reported change in explained variance and the final model R^2.

Within Model 2, depressive symptom severity remained a statistically significant negative predictor of QOL ($B = -1.298$, $SE = 0.227$, $\beta = -0.635$, $t \approx -5.72$, $p < 0.001$), whereas the independent association of religiosity remained statistically non-significant ($B = 0.227$, $SE = 0.209$, $\beta = 0.122$, $t \approx 1.09$, $p = 0.281$). The depression-religiosity interaction term demonstrated a statistically significant positive regression coefficient ($B = 0.101$, $SE = 0.036$, $\beta = 0.307$, $t \approx 2.81$, $p = 0.008$).

The positive interaction coefficient indicates that the negative statistical association between depressive

symptom severity and health-related QOL was less pronounced at higher levels of religiosity within the fitted regression model. Thus, religiosity demonstrated a statistically significant moderating association with depression-related QOL. However, this interaction does not establish a causal protective effect, particularly given the cross-sectional observational design. The regression coefficients are summarised in Table 3, while the model-fit statistics and changes in explained variance are presented in Table 4.

Model	Predictor	B	SE	β	t (approx.)	p-value
Model 1	Depression (HAM-D_C)	−1.142	0.235	−0.559	−4.86	<0.001
Model 1	Religiosity (CRS_C)	0.393	0.214	0.212	1.84	0.072
Model 2	Depression (HAM-D_C)	−1.298	0.227	−0.635	−5.72	<0.001
Model 2	Religiosity (CRS_C)	0.227	0.209	0.122	1.09	0.281
Model 2	Depression × Religiosity (HAM-D_C × CRS_C)	0.101	0.036	0.307	2.81	0.008

TABLE 3: Hierarchical multiple regression coefficients examining religiosity as a moderator of the relationship between depression and quality of life (N = 50)

Hierarchical multiple linear regression analysis examined whether religiosity statistically moderated the association between depressive symptom severity and health-related QOL among women with gynaecological malignancies (N = 50). The dependent variable was the FACT-G total score. Model 1 included mean-centred depression and religiosity scores. Model 2 additionally included the depression-religiosity interaction term. Individual regression coefficients were evaluated using the t-test, with residual degrees of freedom of 47 for Model 1 and 46 for Model 2. The displayed t-statistics are approximate values calculated as B/SE using the rounded coefficients and standard errors in the manuscript; the p-values are those reported in the original analysis. The significance threshold was $p < 0.05$.

B, unstandardised regression coefficient; β, standardised regression coefficient; CRS_C, mean-centred Centrality of Religiosity Scale score; FACT-G, Functional Assessment of Cancer Therapy-General; HAM-D_C, mean-centred Hamilton Depression Rating Scale score; SE, standard error; t, Student's t-statistic for a regression coefficient.

Model parameter	Model 1	Model 2
Number of predictors	2	3
R^2	0.412	0.496
Adjusted R^2	0.387	0.463
Change in R^2 (ΔR^2)	Not applicable (baseline model)	0.084
Overall F-statistic	16.468	15.073
Model degrees of freedom	(2, 47)	(3, 46)
Overall model p-value	<0.001	<0.001
Change-in-model F-statistic (approx.)	Not applicable (baseline model)	7.67
Change-in-model degrees of freedom	Not applicable (baseline model)	(1, 46)
Change-in-model p-value	Not applicable (baseline model)	0.008
Incremental Cohen's f^2 (approx.)	Not applicable (baseline model)	0.167

TABLE 4: Model summary and change in explained variance in hierarchical multiple regression analysis (N = 50)

Hierarchical multiple linear regression evaluated the moderating association of religiosity with the relationship between depressive symptom severity and health-related QOL. The dependent variable was the FACT-G total score. Model 1 included mean-centred depressive symptom severity and religiosity. Model 2 additionally incorporated the depression-religiosity interaction term. Overall model significance was evaluated using the F-test. The change in explained variance was assessed using the nested-model F-change test with 1 and 46 degrees of freedom. The approximate F-change statistic (7.67) was derived from the rounded reported R^2 values and sample size, while the change-in-model p-value corresponds to the reported interaction test. Incremental Cohen's f^2 was calculated as $\Delta R^2/(1 - R^2$ of Model 2), yielding approximately 0.167. The approximate derived values require verification against the original statistical output before final submission.

ΔR^2, change in explained variance; f^2, Cohen's incremental effect-size measure; F, overall model or nested-model F-statistic; FACT-G, Functional Assessment of Cancer Therapy-General; R^2, coefficient of determination.

Moderating effect of religiosity on the relationship between anxiety and QOL

Hierarchical multiple linear regression analysis was undertaken to evaluate whether religiosity statistically moderated the association between anxiety symptom severity and health-related QOL among the 50 women with gynaecological malignancies. The FACT-G total score was considered the dependent variable. Mean-centred HAM-A scores (HAM-A_C) and mean-centred Centrality of Religiosity Scale scores (CRS_C) were entered as explanatory variables in Model 1. In Model 2, the anxiety-religiosity interaction term (HAM-A_C × CRS_C) was introduced to assess statistical moderation. Assuming complete-case analysis of all 50 participants, the residual degrees of freedom were 47 and 46 for Models 1 and 2, respectively.

Spearman's rank correlation analysis demonstrated a significant negative association between anxiety symptom severity and QOL ($r_s = -0.759$, $p < 0.001$), a significant negative association between religiosity and anxiety symptom severity ($r_s = -0.395$, $p = 0.005$), and a significant positive association between religiosity and QOL ($r_s = 0.399$, $p = 0.004$), as summarised in Table *2*. The original hierarchical regression analysis did not identify a statistically significant anxiety-religiosity interaction. Therefore, statistical moderation of the anxiety-QOL association by religiosity was not established in the study population. These findings should be interpreted as observational associations rather than evidence of causal effects.

Discussion

Sociodemographic and clinical context

The sociodemographic and clinical characteristics of women with gynaecological malignancies are important considerations when interpreting their psychological well-being and health-related QOL. Previous Indian epidemiological and hospital-based investigations have documented the substantial burden of cervical and ovarian malignancies, alongside marked variations in socioeconomic circumstances, access to healthcare, and patterns of clinical presentation [5,23-26]. The present study population was characterised by predominantly rural residence, limited formal education, lower socioeconomic status, and advanced-stage malignancy. These characteristics reflect a clinical context in which psychological adjustment may be influenced not only by cancer-related symptoms but also by financial insecurity,

restricted healthcare access, family responsibilities, and limited availability of psychosocial support.

Earlier Indian investigations have highlighted the importance of cancer awareness, timely diagnosis, and accessible oncology services in addressing the burden of gynaecological malignancies [25,26]. Delayed clinical presentation may arise from interacting socioeconomic, educational, geographical, and healthcare system factors. Such circumstances may also influence patients' perceptions of illness, treatment-related uncertainty, and emotional well-being. Nevertheless, the determinants of delayed presentation were not directly investigated in the present study, and the predominance of advanced-stage disease should not be attributed to any particular cause without additional evidence. The concentration of advanced-stage malignancies also warrants consideration when interpreting the applicability of the findings to women with early-stage disease or different clinical backgrounds.

Depression and anxiety among women with gynaecological malignancies

Psychological distress is increasingly recognised as an important component of the overall burden experienced by women undergoing treatment for gynaecological cancers. Previous investigations have demonstrated that depression and anxiety may occur at different stages of diagnosis, treatment, and survivorship, although reported frequencies vary substantially according to the cancer population, assessment method, clinical setting, and diagnostic thresholds employed. Mendonsa and Appaya described psychiatric morbidity among women attending a gynaecological oncology outpatient clinic in India [27], while Wang and colleagues examined factors associated with anxiety and depression among women undergoing surgery for endometrial cancer [28]. Furthermore, Ghamari and colleagues, in a systematic review and meta-analysis, examined depressive and anxiety symptoms among women with ovarian cancer [29]. Collectively, these investigations support the clinical relevance of psychological distress assessment in gynaecological oncology. A systematic review and meta-analysis by Mejareh and colleagues further demonstrated the substantial global burden of depression among patients with cancer, emphasising the importance of psychological assessment as part of comprehensive oncological care [30].

The psychological consequences of gynaecological malignancies are multifactorial and may involve uncertainty about prognosis, physical symptom burden, treatment-associated adverse effects, financial difficulties, altered family functioning, and concerns regarding reproductive or sexual health. Women may additionally experience distress related to body image, hormonal changes, fertility, femininity, and perceived family responsibilities. Depression among patients with cancer has been recognised as a significant clinical concern requiring appropriate assessment and management [8]. These considerations suggest that psychological distress should be understood within the broader physical, emotional, social, and existential experiences of women with cancer rather than interpreted exclusively as a response to disease stage or treatment modality.

The relationship between depressive and anxiety symptoms also deserves particular attention. Although depression and anxiety represent distinguishable psychological constructs, they share several clinical manifestations, including sleep disturbances, impaired concentration, fatigue, somatic complaints, and emotional distress. Their coexistence may contribute to a greater overall burden of psychological symptoms and complicate clinical assessment. In medically ill populations, standardised rating scales may also capture symptoms attributable partly to malignancy or its treatment. Consequently, symptom severity scores should be interpreted alongside clinical assessment rather than treated as independently confirmed psychiatric diagnoses. The close relationship between depressive and anxiety symptoms supports the importance of comprehensive psychiatric evaluation rather than assessment of either symptom domain in isolation.

Sociodemographic characteristics may influence psychological adjustment by affecting healthcare knowledge, treatment accessibility, social support, coping opportunities, and financial resources. Educational status, marital circumstances, residential background, and family structure may therefore be relevant contextual variables. However, the descriptive differences observed across these categories in the present study did not establish independent predictors of psychological distress. The limited sample size and unequal subgroup distributions further restricted the reliability of between-group comparisons. Larger investigations incorporating appropriate multivariable analyses are necessary to determine whether these characteristics independently influence depressive and anxiety symptom burden among women with gynaecological malignancies.

Psychological distress and health-related QOL

Health-related QOL represents a multidimensional outcome encompassing physical functioning, emotional well-being, social relationships, and the ability to perform everyday activities. The FACT-G, developed and validated by Cella and colleagues, provides an established framework for evaluating these dimensions in patients with cancer [21]. Unlike conventional oncological outcomes, which frequently emphasise disease control and survival, QOL assessment incorporates the patient's subjective experience of illness and treatment. This distinction is particularly important in gynaecological oncology because malignancy and its treatment may affect physical health, emotional adjustment, intimate relationships, reproductive functioning, and family life.

The inverse relationships between psychological symptom severity and QOL observed in the present investigation are consistent with the broader clinical understanding that emotional distress and patient-reported well-being are closely interconnected. Depression may be associated with reduced motivation, diminished participation in daily activities, fatigue, hopelessness, and impaired social functioning. Anxiety may contribute to persistent worry, fear of disease progression, uncertainty regarding treatment outcomes, and difficulties maintaining everyday activities. Previous psycho-oncology research has emphasised the clinical importance of depression among patients with cancer [8], while other investigations have examined spirituality and related psychosocial factors in relation to emotional well-being and QOL [10,12]. These observations suggest that psychological assessment should form an important component of comprehensive oncology care.

The relationship between psychological distress and QOL is likely bidirectional and influenced by multiple clinical and psychosocial factors. Greater symptom burden and functional impairment may contribute to emotional distress, while depressive or anxiety symptoms may adversely influence perceived health and daily functioning. Both processes may also be affected by shared factors such as disease severity, treatment toxicity, financial hardship, comorbid conditions, and social circumstances. Because the present investigation employed a cross-sectional design, the temporal direction of these relationships could not be established. Therefore, the observed associations should not be interpreted as demonstrating that depression or anxiety directly caused deterioration in QOL.

Family relationships and social circumstances may additionally influence the experience of gynaecological malignancy, particularly within the Indian sociocultural context. Family involvement may provide emotional reassurance, practical assistance, financial support, and help with treatment-related decisions. Nevertheless, family relationships may also be associated with caregiving responsibilities, interpersonal difficulties, and concerns regarding dependence. The present investigation did not independently quantify perceived social support or caregiver involvement. Accordingly, the potential contribution of family functioning to psychological distress and QOL remains an important subject for further investigation.

Religiosity and psychological well-being

Religiosity and spirituality have received increasing attention as potentially important dimensions of psychological adjustment among individuals facing serious illness. Although closely related, these concepts are not interchangeable. Spirituality may encompass meaning, purpose, connectedness, transcendence, and existential well-being, whereas religiosity more specifically concerns religious beliefs, practices, experiences, and their importance within an individual's life. Huber and Huber developed the Centrality of Religiosity Scale to evaluate religious involvement through intellectual engagement, ideological beliefs, public religious practice, private religious practice, and religious experience [22]. This distinction is methodologically important because investigations using measures of spiritual well-being, religious coping, and religiosity may evaluate different psychosocial constructs.

Previous research has examined spirituality and religious involvement in relation to emotional adjustment and QOL among patients with cancer. Yoon and colleagues investigated spiritual well-being in palliative care populations with different religious affiliations [9], while Abou Chaar and colleagues examined spirituality in relation to QOL, anxiety, and depression among patients with cancer [10]. Bai and colleagues also explored relationships involving spirituality and QOL among individuals experiencing cancer-related pain [12]. These studies provide a relevant conceptual background for interpreting the present findings, although differences in clinical populations, religious traditions, cultural environments, and assessment instruments limit direct comparisons.

Religious involvement may contribute to psychological adjustment through several potential psychosocial pathways. Religious beliefs and practices may provide a framework for interpreting illness, maintaining hope, finding meaning, and developing acceptance during periods of uncertainty. Private practices such as prayer may offer emotional reassurance, while participation in religious communities may facilitate social interaction, perceived connectedness, and interpersonal support. Such processes may be particularly relevant in societies where religious beliefs and practices are closely integrated into everyday family and community life. However, these potential mechanisms remain explanatory possibilities rather than established causal pathways in the present investigation.

The associations involving religiosity should also be interpreted in the context of the diversity of individual religious experiences. Greater religious involvement may be beneficial for some patients, whereas others may experience religious conflict, spiritual distress, guilt, or dissatisfaction with perceived religious support. Individuals who do not identify with organised religion may rely on alternative sources of meaning, emotional resilience, and social connectedness. The Centrality of Religiosity Scale measures the relative importance of religion in an individual's life but does not independently determine whether religious involvement functions as a positive or negative coping strategy. Consequently, higher religiosity should not automatically be interpreted as evidence of adaptive coping, nor should religious participation be considered universally beneficial.

Moderating role of religiosity in the relationship between depression and QOL

An important methodological contribution of the present study was the examination of religiosity as a potential statistical moderator of the relationship between depressive symptom severity and health-related QOL. A moderating variable influences the strength or direction of the association between an explanatory variable and an outcome. This differs from an independent association, in which religiosity is examined solely as a correlate of psychological distress or well-being. The interaction identified in the depression-related regression model suggests that the relationship between depressive symptoms and QOL may vary according to the centrality of religious beliefs and practices.

Previous investigations have explored the relationships among spirituality, emotional adjustment, and QOL in oncology populations [9,10,12]. However, associations involving spiritual well-being or religious coping should not be regarded as directly equivalent to a statistical interaction involving religiosity measured using the CRS-15. The present investigation extends this conceptual framework by evaluating whether the association between depressive symptom severity and patient-reported QOL differs across levels of religiosity. Such an approach may provide additional insight into the complexity of psychosocial adjustment, although the observed interaction requires independent replication.

Several mechanisms could potentially explain why the relationship between depressive symptoms and QOL might differ according to religiosity. Religious beliefs may influence how individuals interpret illness-related adversity, understand suffering, maintain hope, and perceive personal meaning during cancer treatment. Religious practices may also provide structured routines, opportunities for emotional expression, or access to supportive communities. These processes might influence the subjective experience of illness-related distress and functioning. Nevertheless, the present study did not directly assess religious coping strategies, perceived social support, spiritual struggle, or the mechanisms underlying the observed interaction. The statistical moderation therefore cannot be attributed to any specific psychological or religious process.

The absence of an independently demonstrated moderating association involving anxiety also warrants consideration. Although depression and anxiety frequently coexist, they may differ in their predominant psychological characteristics and relationships with coping resources. Depression may be associated with hopelessness, loss of motivation, reduced engagement in meaningful activities, and diminished perceived well-being. Anxiety may be more strongly related to anticipatory worry, uncertainty, vigilance, and fear concerning disease progression or treatment outcomes. These distinctions could contribute to different relationships with religious involvement. However, they represent possible explanations rather than mechanisms established by the present analysis.

Importantly, a statistically significant interaction in the depression model and a non-significant interaction in the anxiety model do not independently demonstrate that the two interaction effects differ significantly from one another. Such a conclusion would require a direct statistical comparison using an appropriate analytical framework. Furthermore, the relatively small sample size, limited adjustment for potential confounders, and cross-sectional design restrict interpretation. The results should therefore be considered preliminary evidence of statistical effect modification rather than confirmation that religiosity protects against depression-related deterioration in QOL.

Comparison with previous research and sociocultural relevance

Existing literature supports the importance of considering psychological, religious, and spiritual factors in the comprehensive assessment of patients with cancer, although the nature and strength of their associations vary across populations. Investigations involving women with gynaecological malignancies have documented psychological morbidity and its potential relationship with clinical and social circumstances [27-29]. Similarly, studies examining spirituality and religious involvement have identified associations with psychological adjustment and patient-reported outcomes in different cancer populations [9,10,12]. These findings collectively suggest that psychosocial well-being is influenced by multiple interacting dimensions rather than by oncological factors alone.

The present study contributes evidence from women receiving gynaecological oncology care in an Indian hospital setting. Religious beliefs, family relationships, cultural expectations, and community participation may be relevant to how patients interpret serious illness and seek support. However, the meaning and expression of religiosity may differ considerably across religious traditions, geographical settings, and socioeconomic groups. Moreover, the assessment of religious centrality should not be assumed to capture every aspect of spirituality or religious coping. These considerations limit direct generalisation from studies conducted in different cultural environments and underscore the importance of culturally sensitive interpretation.

The existing literature also indicates the need to distinguish between correlations and moderation effects. A direct association between religiosity and QOL does not necessarily imply that religiosity modifies the relationship between psychological distress and QOL. Conversely, a statistically significant interaction does not establish the effectiveness of religious involvement as an intervention. The present study's use of

hierarchical regression provides a framework for exploring these relationships, but larger prospective investigations are necessary to determine whether the observed interaction is reproducible across different cancer populations and healthcare settings.

Clinical implications

The findings have potential implications for the integration of psychological and psychosocial assessment into routine gynaecological oncology care. Psychological distress may coexist with physical symptoms, treatment-related adverse effects, functional impairment, and uncertainty regarding prognosis. Assessment of depressive and anxiety symptoms may help identify patients who require more comprehensive psychiatric or psychological evaluation. Collaborative care involving oncologists, psychiatrists, psychologists, nursing professionals, and other healthcare providers may support a more comprehensive approach to the physical and emotional needs of women with gynaecological malignancies.

Individual religious beliefs, spiritual concerns, and preferred coping strategies may also be relevant components of psychosocial assessment. Healthcare professionals may consider discussing these dimensions when they are important to the patient and when such discussions are consistent with her preferences. Culturally sensitive supportive care may involve recognising patient-valued religious or spiritual resources, addressing existential concerns, and facilitating access to appropriate psychosocial support. Such approaches should remain voluntary and respectful of patients with different religious affiliations or non-religious perspectives.

Religious and spiritual support should complement rather than replace evidence-based psychiatric treatment, psychological interventions, symptom management, or oncological care. The present study did not evaluate a religious, spiritual, or psychological intervention and therefore cannot establish whether increasing religious participation would reduce distress or improve QOL. The clinical relevance of the observed associations lies primarily in recognising the diversity of patients' psychosocial needs and considering their individual beliefs and coping preferences within a patient-centred model of care.

Strengths of the study

An important strength of the present investigation was the integrated assessment of depressive symptoms, anxiety symptoms, religiosity, and health-related QOL among women with histopathologically confirmed gynaecological malignancies. The use of established assessment instruments provided a structured approach to evaluating psychological and psychosocial characteristics within the same study population [16,18,21,22]. The inclusion of hierarchical regression with an interaction term also permitted exploration of a potential moderating association beyond conventional bivariate correlation analysis.

The study additionally contributes context-specific observations from an Indian gynaecological oncology population, where religious beliefs and practices may represent meaningful aspects of individual identity and illness experience. The inclusion of demographic and clinical characteristics provides a framework for interpreting these psychosocial relationships within the circumstances of the study population. Nevertheless, these strengths must be considered alongside the methodological limitations associated with the sample size, observational design, and measurement strategy.

Limitations and future directions

The present study has several limitations that should be considered when interpreting its findings. First, the investigation was conducted at a single centre and included a relatively small sample recruited through consecutive non-probability sampling. This approach may introduce selection bias and restrict the representativeness of the study population. The predominance of advanced-stage malignancy, cervical cancer, rural residence, and lower socioeconomic status further limits generalisability to women with other gynaecological malignancies, earlier-stage disease, or different sociocultural backgrounds. The small sample and unequal subgroup distributions also restricted meaningful comparisons across demographic and clinical categories.

Second, the cross-sectional observational design prevented determination of temporal relationships among psychological distress, religiosity, and health-related QOL. Although the regression analysis identified a statistical interaction involving religiosity and depressive symptoms, the findings cannot establish that religious involvement causally reduces the adverse consequences of depression or improves QOL. Reverse associations and shared influences from unmeasured clinical or psychosocial factors remain possible.

Third, the moderation analyses did not comprehensively account for potentially relevant confounding factors, including disease stage, cancer type, treatment modality, physical symptom burden, comorbid conditions, socioeconomic circumstances, and perceived social support. These characteristics may influence both psychological symptoms and patient-reported QOL. Residual confounding therefore cannot be excluded, and the observed interaction may be sensitive to model specification. In addition, the study did not establish the mechanisms underlying the reported associations.

Fourth, depressive and anxiety symptoms were assessed using clinician-administered symptom-rating instruments rather than structured diagnostic interviews establishing psychiatric diagnoses. Overlap between psychological symptoms and cancer-related physical complaints may have influenced the assessment scores. The CRS-15 measures the centrality of religious involvement but does not independently quantify positive religious coping, negative religious coping, religious struggle, or perceived spiritual distress. Therefore, the study could not determine which specific dimensions of religious experience might explain the observed relationships. Differences in religious traditions and individual interpretations of questionnaire items may also affect measurement comparability.

Future investigations should employ larger, multicentre samples and longitudinal designs to clarify the temporal relationships among depression, anxiety, religiosity, and health-related QOL. Recruitment across different cancer types, stages, socioeconomic groups, and cultural backgrounds would improve external validity and support more meaningful subgroup comparisons. Future studies should incorporate relevant clinical and psychosocial covariates, evaluate the robustness of interaction effects, and distinguish religious centrality from positive and negative religious coping. Prospective intervention studies may subsequently determine whether voluntary, culturally appropriate, patient-centred spiritual or psychosocial support provides additional benefits when integrated with established oncological and psychiatric care.

Conclusions

This study demonstrated significant associations among religiosity, depressive symptoms, anxiety symptoms, and health-related QOL in women with gynaecological malignancies. Higher religiosity was associated with lower depressive and anxiety symptom scores and better QOL. Religiosity also demonstrated a statistically significant moderating association with the relationship between depressive symptom severity and QOL, whereas a corresponding significant interaction involving anxiety was not established.

These findings highlight the potential relevance of individual religious beliefs and coping preferences in culturally sensitive psychosocial oncology care. However, the cross-sectional design and limited sample size preclude causal interpretation. Larger prospective studies are warranted to validate these associations and clarify their clinical significance.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. RIMS Ethics Committee, Raipur Institute of Medical Sciences, Raipur, Chhattisgarh, India issued approval IEC/RIMS/2024/112. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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