

## ORIGINAL RESEARCH

# Quality of life and mental health among gynaecological cancer patients towards the end of COVID-19 pandemic

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**Abstract**

This study aimed to assess the mental health and quality of life (QOL) in gynaecological cancer patients, and to identify key risk factors for improved management. In addition, during a period of reduced impact of a novel coronavirus (COVID-19) infection, we sought to examine its current impact on mental health and QOL. A cross-sectional study was conducted among 175 gynaecological cancer patients. The survey assessed QOL (The World Health Organization Quality of Life-Bref, anxiety and depression (Hospital Anxiety and Depression Scale (HADS))). Multivariable linear regression was used for analysis. Being diagnosed in the last one year was associated with higher HADS depression score ( $p < 0.001$ ) and recurrence was associated with both higher HADS anxiety and depression scores ( $p = 0.004$  and  $p < 0.001$ ). Age  $\leq 60$  years old was a significant negative predictor for psychological health ( $p = 0.002$ ) and overall QOL ( $p = 0.017$ ). Complications during surgery were identified as a significant negative predictor affecting psychological health ( $p = 0.018$ ), but did not affect the other domains. Disease recurrence was observed to significantly influence QOL scores in physical health ( $p = 0.014$ ) and overall QOL ( $p < 0.001$ ). This study highlights that recurrence has a significant impact on mental health and QOL of gynaecological cancer patients. Patients diagnosed within last year should be carefully assessed for risk of depression. Younger patients and those with surgical complications may experience reduced QOL. Importantly, COVID-19 showed no apparent negative impact on the mental health or QOL in these patients, which is no longer considered a significant contributor to adverse effects.

**Keywords**

Gynaecological cancer; Quality of life; Anxiety; Depression; COVID-19

## 1. Introduction

Gynecological cancers account for 14.4% of newly diagnosed cancer cases among women worldwide, making them significant contributors to both mortality and morbidity. These cancers have a profound impact on the mental health and quality of life (QOL) of survivors [1]. In recent years, advancements and standardization in surgical practices and adjuvant treatments have increased the average life expectancy of gynecological cancer patients. However, the disease and its treatments can significantly impact patients, potentially leading to psychological repercussions that negatively affect their QOL. It is important to consider these factors when evaluating the overall well-being of patients [2].

QOL is a patient's personal assessment of every facet of their health journey, including aspects such as physical well-being, mental state, level of independence, interpersonal relationships, individual beliefs and their relationship to significant environmental factors [3]. In a life-threatening condition such as cancer, the challenges associated with the disease and its

treatment can affect QOL in many ways. It is well known that many cancer patients are frequently exposed to situations that can adversely affect their long-term mental health. Treatments such as surgery, chemotherapy and radiotherapy can have a negative impact on QOL due to disease recurrence and treatment complications that may arise during these interventions [3]. In addition, the diagnosis of gynaecological cancer affects aspects of femininity, sexuality and fertility, making it different from other types of cancer. Anatomical or physiological changes resulting from the treatment of gynaecological cancer can lead to sexual dysfunction and erosion of self-esteem, resulting in adverse psychological outcomes [4].

The most recent characterisation of QOL by the WHO describes it as "individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns" [5]. Depression is widely recognised as a significant problem among people diagnosed with cancer, and there is increasing evidence of the significance of anxiety in this context. Mental health and QOL are currently considered primary

endpoints in assessing the quality of management and care in oncology practice. Furthermore, all of these parameters have a direct impact on the survival of cancer patients [6]. In addition to the aforementioned issues for gynaecological cancers, since 2019, ongoing novel coronavirus (COVID-19) infection has emerged as a significant additional health problem for several vulnerable groups, including people with various types of cancer [7]. It has a direct impact on patients' QOL and mental health. One of the secondary aims of our study is to assess the impact of the pandemic on the mental health and QOL of our cohort during a relatively calmer period with a reduced influence of COVID-19 compared to the tumultuous phases of the previous outbreak.

Gynaecological cancers are often associated with diagnostic procedures and treatments that can lead to reduced QOL and negative mental health outcomes. Ultimately, efforts directed at gynaecological cancers should not only focus on disease control, but should also prioritise improving women's mental health and maintaining and improving their QOL. The primary objective of this study was to examine the mental health and QOL status of gynaecological cancer patients and subsequently identify risk factors. By delineating these risk factors, there is the potential for improved management of associated problems, thereby promoting improved psychological adjustment and overall QOL.

## 2. Methods

### 2.1 Participants

A cross-sectional study was conducted of 175 adult patients with gynaecological cancer attending an obstetrics and gynaecology clinic in a teaching and research hospital. The study sought individuals who were 18 years of age or older, able to understand and complete questionnaires, and free of significant cognitive impairment. Significant cognitive impairment was determined by clinical interview and medical history obtained from the patient or their relatives. Participants were also required to have no history of antidepressant or other psychiatric medication use. Of the 180 eligible patients invited to participate, three were excluded due to incomplete data and two refused to participate.

### 2.2 Study design

The survey period was from September 2022 to September 2023. The surveys were paper-based. All enrolled participants underwent an assessment using a specialized survey with different sections. This survey included three specific questionnaires: the World Health Organization Quality of Life-BREF (WHOQOL-BREF), the Hospital Anxiety and Depression Scale (HADS), and a 5-item Likert scale comparative assessment of mental health and QOL between the entire COVID-19 pandemic period and the current pandemic waning phase. The comprehensive dataset includes information on age distribution, diagnostic details, duration of diagnosis, presence of comorbidities, history of COVID-19 infection, adjunctive therapies used, surgical complications and cases of disease recurrence.

## 2.3 Instruments

### 2.3.1 WHOQOL-BREF questionnaire

The WHOQOL-BREF questionnaire measures four dimensions of QOL: physical health, psychological well-being, social relationships and environmental aspects. These domains comprise 24 items, each of which is scored between 0 and 100 [8, 9]. In addition, there are two items that assess overall self-perceived QOL and general health, scored on a scale of 0 to 10. Higher scores indicate better QOL (positive orientation). There are no predefined benchmarks for WHOQOL-BREF scores; therefore, in this study, QOL scores were treated strictly as continuous variables without specific thresholds. A demographic information sheet to collect personal data and the Turkish version of the World Health Organization Quality of Life Short Form WHOQOL-BREF (TR) were used as survey instruments, adapted for administration in Turkish [10]. The reliability of the data was assessed with a Cronbach's alpha of 0.83.

### 2.3.2 HADS anxiety and depression score

The secondary measure was a validated and translated iteration of the 14-item Hospital Anxiety and Depression Scale (HADS) [11]. The validity and reliability of the survey had previously been confirmed within a Turkish population [12]. The HADS consists of two subscales assessing anxiety (HADS-A) and depression (HADS-D). Each item on this Likert-type scale is rated on a scale of 0 to 3, with a maximum cumulative score of 21 per survey. Scores between 0 and 8 indicate healthy individuals, while scores between 8 and less than 11 indicate borderline depression or anxiety. Scores equal to or greater than 11 indicate severe levels of depression or anxiety. The Cronbach alpha coefficients for anxiety and depression were found to be 0.82 and 0.72 respectively.

## 2.4 Statistical analysis

Statistical analysis was performed using SPSS 22.0 software (SPSS Inc., Chicago, IL, USA) and results were presented in tabular form. Multivariable linear regression was used to examine the association between patient characteristics and both QOL and mental health. Statistical significance was defined as  $p < 0.05$  for two-tailed tests. Descriptive statistics were used to outline the analysis of the data, expressed as means and standard deviations. The validity and reliability of the questionnaire were assessed using a cohort of 40 participants. The validity of the data was examined using the Pearson bivariate method, and the reliability of the data was determined using Cronbach's alpha.

## 3. Results

Baseline and other characteristics of the women surveyed are described in Table 1. Their mean age was 56.42 years (Standard Deviation (SD)  $\pm 15.12$ ); 44% ( $n = 77$ ) were over 60 years of age. Table 1 shows the means and standard deviations of the QOL and mental health questionnaire scores for different domains and subscales relevant to gynaecological cancer. The mean overall QOL and general health score was  $6.76 \pm 1.81$ . The mean HADS Anxiety and HADS Depression scores were

**TABLE 1. Baseline characteristics and other examined characteristics of the surveyed women.**

Examined Characteristics	Mean	SD
Age	56.42	15.12
Physical health	56.97	20.42
Psychological health	47.38	24.83
Social relationships	47.62	22.90
Environment	47.60	22.77
Overall QOL and general health	6.76	1.81
Anxiety	8.48	3.93
Depression	8.90	4.21
Examined Characteristics	N (175)	% (100)
Age		
≤60	98	56
>60	77	44
Diagnosis		
Endometrial	58	33.1
Ovarian	54	30.9
Cervical	56	32.0
Vulvar	7	4.0
Time for diagnosis		
≤1 year	55	31.4
>1 year	120	68.6
Comorbidity		
No	100	57.1
Yes	75	42.9
History of COVID-19 infection		
No	91	52
Yes	84	48
Adjuvant treatment		
No	93	53.1
Yes	82	46.9
Complications in surgery		
No	158	90.3
Yes	17	9.7
Recurrence		
No	146	83.4
Yes	29	16.6

*QOL: quality of life; SD: Standard Deviation.*

8.48 ± 3.93 and 8.9 ± 4.21, respectively.

The diagnoses were endometrial (58 of 175; 33.1%), ovarian (54 of 175; 30.9%), cervical (56 of 175; 32%) and vulvar (7 of 175; 4%) cancer. The majority of patients were diagnosed with cancer more than 1 year ago (120 of 175; 68.6%), and 100 of 175 patients (57.1%) had a comorbidity in addition to gynaecological cancer. Of the 175 patients surveyed, 84 (48%) had a history of COVID-19 infection. In addition, 82 patients (46.9%) underwent adjuvant treatment. Surgery proceeded without complications in 158 patients (90.3%), while

29 patients (16.6%) experienced cancer recurrence (Table 1). Table 2 shows the relationship between characteristics of the women surveyed and HADS anxiety and depression scores. A higher prevalence of depression was found among those who had been diagnosed with cancer within the past year ( $p < 0.001$ ). For scores derived from the HADS anxiety and depression domains, recurrence was found to be significantly associated with higher anxiety ( $p = 0.004$ ) and depression ( $p < 0.001$ ) scores. No statistically significant differences were observed in all other parameters compared (age, cancer

**TABLE 2. Factors linked to mental health as identified through linear regression analysis.**

Variable	Mental Health			
	HADS Anxiety		HADS Depression	
	95% CI	<i>p</i> Value	95% CI	<i>p</i> Value
<b>Age</b>				
≤60	Reference	0.243	Reference	0.673
>60	-1.55 to 2.18		-1.10 to 1.70	
<b>Diagnosis</b>				
Endometrial	Reference	0.393	Reference	0.951
Ovarian	-2.01 to 2.64		-2.91 to 1.81	
Cervical	-2.28 to 2.17		1.45 to 3.06	
Vulvar	-6.36 to 2.07		-6.33 to 1.88	
<b>Time for diagnosis</b>				
≤1 year	Reference	0.833	Reference	<0.001
>1 year	-1.14 to 1.41		-3.67 to -1.06	
<b>Comorbidity</b>				
No	Reference	0.390	Reference	0.879
Yes	-1.90 to 0.78		-1.26 to 1.48	
<b>History of COVID-19 infection</b>				
No	Reference	0.852	Reference	0.800
Yes	-1.23 to 1.48		-1.56 to 1.21	
<b>Adjuvant treatment</b>				
No	Reference	0.902	Reference	0.629
Yes	-1.25 to 1.10		-0.91 to 1.50	
<b>Complications in surgery</b>				
No	Reference	0.609	Reference	0.997
Yes	-1.45 to 2.47		-2.01 to 2.00	
<b>Recurrence</b>				
No	Reference	0.004	Reference	<0.001
Yes	0.82 to 4.38		2.15 to 5.80	

*HADS: Hospital Anxiety and Depression Scale; CI: Confidence Interval.*

type, presence of comorbidity, history of COVID-19 infection, administration of adjuvant treatment and presence of surgical complication).

Table 3 shows the factors associated with QOL identified by linear regression analysis. Age ≤60 years was a significant negative predictor affecting psychological health ( $p = 0.002$ ) and overall QOL ( $p = 0.017$ ). Complications during surgery were identified as a significant negative predictor affecting psychological health ( $p = 0.018$ ), but did not affect the other domains. Disease recurrence was observed to significantly influence QOL scores in physical health ( $p = 0.014$ ) and overall QOL ( $p < 0.001$ ). No significant differences were observed in the remaining parameters such as cancer type, time for diagnosis, presence of comorbidity, history of COVID 19 infection, and administration of adjuvant treatment within all subcategories of physical health, psychological health, social

relationships, environment and overall QOL.

Of the total patients, 121 (68.6%) reported a decrease in symptoms of depression, sadness and loss of interest. Approximately half of the patients (53.1%,  $n = 93$ ) perceive a reduction in their current level of anxiety compared to the overall COVID-19 pandemic. More than half of the patients do not express concern about contracting a COVID-19 infection during hospital visits (52.6%,  $n = 92$ ). Two questions relate to QOL assessment; 131 (74.8%) patients feel that daily activities are easier with less social isolation and 108 (61.7%) patients perceive an improvement in their overall QOL (Table 4).

**TABLE 3. Factors associated with QOL identified by linear regression analysis.**

Variable	Physical health		Psychological health		Social relationships		Environment		Overall QOL	
	95% CI	<i>p</i> Value	95% CI	<i>p</i> Value	95% CI	<i>p</i> Value	95% CI	<i>p</i> Value	95% CI	<i>p</i> Value
Age										
≤60	Reference	0.673	Reference	0.002	-7.11 to 9.32	0.791	Reference	0.365	Reference	0.017
>60	17.20 to -3.60		-11.15 to -5.42				-11.97 to 4.43		-1.32 to -0.129	
Diagnosis										
Endometrial	Reference	0.709	Reference	0.951	Reference	0.791	Reference	0.672	Reference	0.589
Ovarian	-3.73 to 19.38		-11.60 to 18.32		-8.30 to 19.72		-10.66 to 17.30		-1.27 to 0.75	
Cervical	-10.28 to 11.80		-12.80 to 15.80		-11.29 to 15.49		-13.33 to 13.39		-1.03 to 0.90	
Vulvar	-23.48 to 18.32		-13.15 to 40.10		-23.93 to 26.76		-16.92 to 33.67		-1.10 to 2.55	
Time for diagnosis										
≤1 year	Reference	0.280	Reference	0.642	Reference	0.767	Reference	0.805	Reference	0.146
>1 year	-2.79 to 10.66		-10.48 to 6.05		-8.79 to 6.50		-8.58 to 6.67		-0.14 to 0.96	
Comorbidity										
No	Reference	0.296	Reference	0.528	Reference	0.517	Reference	0.972	Reference	0.856
Yes	-9.68 to 2.51		-10.68 to 6.38		-10.72 to 5.41		-7.90 to 8.19		-0.638 to 0.53	
History of COVID-19 infection										
No	Reference	0.917	Reference	0.636	Reference	0.378	Reference	0.613	Reference	0.726
Yes	-6.73 to 7.24		-6.51 to 9.99		-11.78 to 4.50		-6.04 to 10.20		-0.485 to 0.69	
Adjuvant treatment										
No	Reference	0.669	Reference	0.646	Reference	0.517	Reference	0.672	Reference	0.724
Yes	-4.79 to 6.79		-5.76 to 9.53		-6.54 to 7.61		-5.54 to 8.57		-0.61 to 0.42	
Complications in surgery										
No	Reference	0.849	Reference	0.018	Reference	0.443	Reference	0.835	Reference	0.071
Yes	-10.88 to 9.34		-20.98 to -1.32		-9.13 to 14.41		-10.50 to 12.98		-1.64 to 0.07	
Recurrence										
No	Reference	0.014	Reference	0.125	Reference	0.631	Reference	0.462	Reference	<0.001
Yes	-18.40 to -1.72		-18.83 to 2.25		-13.32 to 8.09		-14.67 to 6.69		-2.56 to -1.01	

*QOL: quality of life; CI: Confidence Interval.*

**TABLE 4. Comparative Likert scale assessment of mental health and QOL between the entire COVID-19 pandemic period and the current phase of pandemic subsidence.**

Questions	Strongly agree or agree	Neither agree nor disagree	Strongly disagree or disagree
	n (%)	n (%)	n (%)
“I experience a decrease in symptoms of depression, sadness and loss of interest”	121 (68.6)	23 (13.1)	32 (18.3)
“I perceive a reduction in my anxiety levels”	93 (53.1)	49 (28.0)	33 (18.9)
“I am concerned about getting COVID-19 infection during hospital visits”	28 (16.0)	55 (31.4)	92 (52.6)
“Daily activities are easier with reduced social isolation”	131 (74.8)	29 (16.6)	15 (8.6)
“I believe there has been an improvement in my overall QOL”	108 (61.7)	33 (18.9)	34 (19.4)

*QOL: quality of life.*

#### 4. Discussion

Cancer patients typically show a higher susceptibility to anxiety and depression than the general population, particularly in women, whose gender is one of the main predisposing factors for the development of psychopathological conditions [13]. We therefore focused our attention on gynaecological cancer patients, examining and contrasting the psychometric and QOL scores of women undergoing surgery, chemotherapy and follow-up at the end of the COVID-19 pandemic. While the study highlighted the impact of various factors on mental health and QOL, particular attention was paid to the notable impact of recurrence on both of these parameters. Furthermore, as we approach the end of the COVID-19 pandemic, our study results suggest that the previously observed effects of reduced QOL, increased depression and increased anxiety as a result of the epidemic are no longer evident [7, 14]. At present, these factors do not appear to negatively affect the mental health and QOL of gynaecological cancer patients in our study.

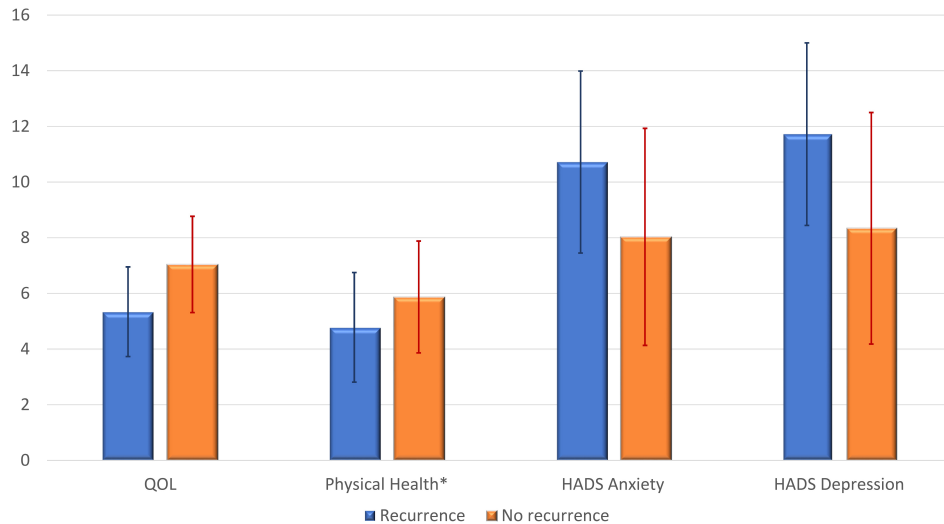
Patients who experience a recurrence, and who often undergo a combination of surgery and chemotherapy, are at risk of experiencing long-term psychological distress that can significantly affect their QOL and mental health [15–17]. Psychological responses following cancer recurrence often include depressive and anxiety symptoms, including a diminished sense of hope for recovery, fear of mortality, and challenges associated with disability (Fig. 1). In addition, the progression of the disease contrasts with patients’ efforts to cope with the initial diagnosis [18, 19]. In addition to the potential adverse effects of surgery on patients with recurrent gynaecological cancer, several factors contribute to the overall impact on QOL, including social and emotional support, health behaviours, spiritual or philosophical beliefs, and body image concerns [13]. We attribute the significant changes in mental health and QOL observed in patients with recurrent disease to the increased attention given to monitoring mental health and QOL issues as a result of the exponential increase in disease burden.

The cancer process itself had an impact on both QOL and

mental health [19]. This association may be due to the initially elevated depression and anxiety scores and lower QOL scores observed in our patients. In addition, the current study showed that the addition of adjuvant treatment to surgery did not affect patients’ mental health and QOL. In particular, it’s important to consider that the adverse effects of adjuvant treatment on mental health and QOL may differ depending on the time since diagnosis, which could be a significant factor contributing to the absence of this distinction in our study. The significantly higher level of statistically significant depression found in patients diagnosed with gynaecological cancer within the last year supports this view. Consistent with our findings, research suggests that the first year after diagnosis is a time of heightened anxiety for cancer patients due to uncertainties about treatment, disruptions in work and personal life, potential side effects, disease progression, and possible relapse [20].

A systematic review has found that younger patients may be more likely to suffer from feelings of loneliness, relationship dissatisfaction, distress about long-term sexual problems, and concerns about how they feel cancer has changed their body [2]. Overall, young age was associated with poorer adjustment on a range of QOL measures, from the number of sexual problems to the severity of psychosexual distress. Another plausible explanation is that increased complication rates resulting from frequent aggressive surgery in younger patients may contribute to lower psychological health scores, as observed in our study.

In addition, we report better mental health and overall QOL with increasing age. When discussing age and mental health in the study, we would like to emphasise that, given the borderline nature of depression and anxiety, advancing age does not result in a significant change in these scores. Our study has several limitations that need to be acknowledged. Firstly, the scope of the study was limited, mainly involving participants from a single centre. This could potentially introduce bias and limit the generalisability of the findings. Secondly, the total number of cases included in the study was not large enough. Although no discernible difference between mental health and QOL was observed between different types of gynaecological cancer in our study, certain types of cancer that may affect QOL



**FIGURE 1. The mean and standard deviation values of overall QOL, Physical Health, HADS Anxiety, and Depression among patients with and without recurrence. (\*) The data is presented in a 10-point scale in the table. QOL: quality of life; HADS: Hospital Anxiety and Depression Scale.**

and mental health differently were not specifically excluded. Finally, a notable limitation is the lack of a control group in the study design.

## 5. Conclusions

In conclusion, this study highlights recurrence as the most important factor influencing mental health and QOL in women with gynaecological cancer. There is a recommendation for careful assessment of patients diagnosed with gynaecological cancer within the last year, given their increased susceptibility to depression, and it is noteworthy that QOL may decrease in younger patients and/or those with surgical complications. In addition, it is observed that the negative impact of COVID-19 infection on mental health and QOL is not as pronounced as it was during the peak of the pandemic.

## AVAILABILITY OF DATA AND MATERIALS

The data underpinning the findings of this study can be obtained from the corresponding author, UA, upon a reasonable request.

## AUTHOR CONTRIBUTIONS

UA—project development, manuscript writing. SK—data collection or management/editing. YU—data analysis/editing.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study protocol was approved by the institutional Ethics Committee of Ankara Training and Research Hospital (approval number: 2022/1065). Informed consent was obtained from all individual participants included in the study.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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