

# Gender Differences in Coping, Depression, and Anxiety in Patients with Non-Metastatic Lung Cancer

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**Background:** Depression and anxiety are prevalent issues amongst individuals suffering from thoracic cancer. Gender differences in coping with thoracic cancer have a serious impact upon the management of emotional distress. The purpose of our study has been to assess sex variations in handling anxiety and depression, including the use of coping mechanisms and their relationship with respect to anxiety and depression.

**Methods:** This cross-sectional study registered 18 women and 22 men with non-metastatic lung cancer and operated upon. Pre-operatively and at one month post-operatively, the patients were assessed by means of scales (COPE, GAD-7 and PHQ-9).

**Results:** Post-operatively, the intensity of depression and anxiety was substantially greater in males than in females ( $p = 0.049$ ,  $p = 0.042$ ). Male individuals tended to use coping mechanisms of humour ( $p = 0.009$ ) and restraint ( $p = 0.029$ ) significantly more frequently than women. Moreover, in women, depression correlated significantly with denial and behavioural deactivation ( $\rho = 0.465$ ,  $p = 0.029$ , respectively,  $\rho = 0.562$ ,  $p = 0.006$ ); whilst anxiety, similarly, correlated with positive interpretation, behavioural deactivation, and use of social-emotional support ( $\rho = 0.484$ ,  $p = 0.022$ , respectively,  $\rho = 0.590$ ,  $p = 0.004$  and  $\rho = 0.502$ ,  $p = 0.017$ ). Furthermore, in males, depression correlated significantly with mental deactivation, use of social-instrumental and social-emotional support ( $\rho = 0.702$ ,  $p = 0.001$ , respectively,  $\rho = 0.505$ ,  $p = 0.033$ , and  $\rho = 0.773$  with  $p < 0.001$ ), whilst anxiety correlated significantly with mental deactivation, denial, and use of social-emotional support ( $\rho = 0.597$ ,  $p = 0.009$ , respectively,  $\rho = 0.553$  with  $p = 0.017$  and  $\rho = 0.755$ ,  $p < 0.001$ ).

**Conclusion:** There were gender divergences in the use of coping mechanisms and the level of post-surgical anxiety and depression. We found significant positive relationships between some coping mechanisms and depression/anxiety. The patient’s gender governs the coping style, which in turn has bearing upon the post-operative evolution.

**Keywords:** coping, anxiety, depression, non-metastatic lung cancer, gender differences

## Introduction

Thoracic cancer comprises non-metastatic lung cancer, lung metastases, esophageal cancer, mediastinal tumours, bone tumours, as well as breast cancer. It is the most diagnosed cancer while also representing the prime cause of cancer death.<sup>1</sup> The most prevalent type of thoracic cancer is non-metastatic lung cancer; it is a severe condition habitually accompanied by a considerably reduced life expectancy, regardless of current medical progress.<sup>2</sup>

Patients, upon being diagnosed with life-threatening ailments – such as cancer – with low life expectancy, undergo severe emotional stress.<sup>3</sup>

Hence, it comes as no surprise that up to 40% of cancer patients have emotional disorders or experience symptoms of anxiety and depression.<sup>4-6</sup>

Current medical literature focuses chiefly upon surgery, chemotherapy, or radiotherapy as treatment options for tumours; however, the impact of psychological factors has mostly been overlooked.<sup>7</sup> In fact, psychological distress in cancer patients can engender a considerable reduction in their quality of life (QoL)<sup>5,8</sup> even with improvements in the field of cancer treatment.<sup>9</sup>

Distress Management Guideline from the National Comprehensive Cancer Network (NCCN) backs the systematic screening for psychological distress in cancer patients.<sup>10,11</sup>

Anxiety and depression are regularly encountered in psychological distress, considered as contributing to psychiatric morbidity, following the diagnosis of cancer.<sup>12</sup> Most cancer patients experience varying levels of psychological trouble, which shape the evolution of cancer.<sup>13</sup>

Several studies purport that the extent of depression and anxiety varies considerably in relation to parameters, such as age, gender, and type of cancer.<sup>5,14,15</sup>

In more than 50% of cases, women, and patients younger than 50 years old, had clinical and sub-clinical forms of anxiety and depression, whilst elderly patients had better emotional tolerance in handling the diagnosis.<sup>5,15</sup> The inverse relationship between age and emotional distress in cancer patients can generally be explained by the greater functional impact of the condition upon the everyday life of younger patients and their belief that “they haven’t yet lived their life” compared to older people who may already have an impairment in daily functioning, have longer biographical history behind them and are better prepared cognitively or emotionally to accept the condition. As a matter of fact, immune depression can be brought about by anxiety and depression, negatively impacting the evolution of cancer.<sup>15,16</sup>

The American Psychiatric Association states that every individual answers differently to the diagnosis of a tumour, whether benign or malignant; while some may exhibit symptoms specific to anxiety or depression, others may suffer from both psychiatric conditions simultaneously.

Since the diagnosis of cancer and post-operative recovery create stressful states, one must turn towards the several coping mechanisms to manage the situation. Based upon their manner of interpreting the circumstances, as well as their coping style, individuals make different cognitive or behavioural attempts at managing novel trials.<sup>17</sup>

It is widely considered that a pivotal link exists between coping strategies and the presence of anxiety or depression.<sup>18–20</sup>

Folkman and Lazarus (1984), the founders of the coping and stress theory, outlined coping as

constantly changing cognitive and behavioural efforts to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person and stress “as exposure to stimuli appraised as harmful, threatening, or challenging, that exceeds the individual’s capacity to cope.”<sup>17,21</sup>

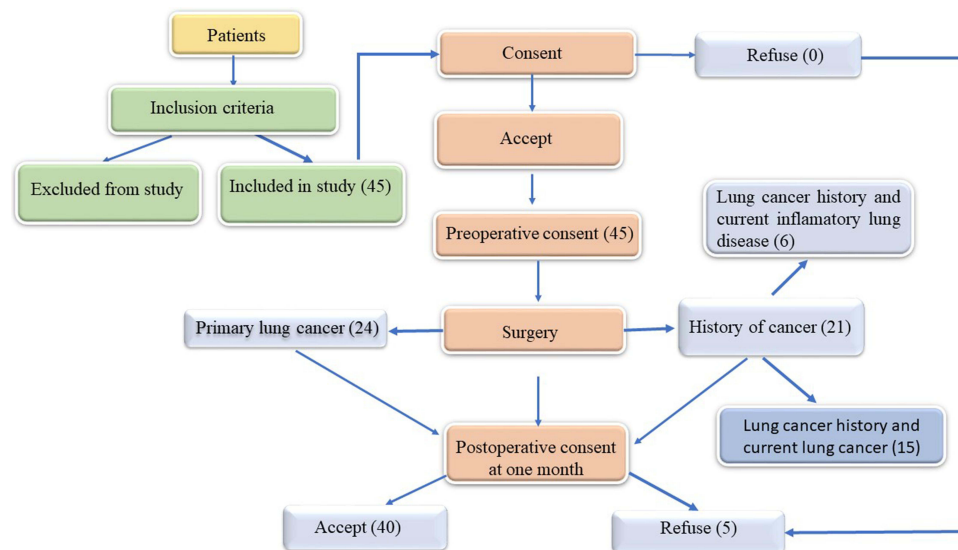
When it comes to coping and gender differences, anterior studies assert that men use problem-focused coping mechanisms predominantly, whilst making lesser use of emotion-focused coping mechanisms/avoidance coping styles, as compared to women, in non-clinical populations.<sup>22–25</sup>

Only few studies in medical literature – about the oncological population – analyse the distinctions in coping with disease with respect to gender.<sup>26–30</sup>

Considering the above-mentioned, the current investigation not only assessed the existence of gender differences in anxiety, depression and coping mechanisms used by patients with non-metastatic lung cancer who underwent surgery but also explored the relationship between coping and anxiety/depression.

## Materials and Methods

The health archives of the 40 patients identified with thoracic surgical pathology throughout November 2018 and November 2019 were examined pre-operatively and post-operatively. Data were collected from the Department of Thoracic Surgery of the Municipal Emergency Hospital of Timisoara, Romania. From the files, the following patient information was used: registration number, age, gender, address, marital status, education, occupation, smoking status, period and duration of hospital stay, complications, organ involvement, standard laboratory tests and result. All patients gave informed written consent for enrolment in our study (Figure 1).



**Figure 1** Flow diagram.

The study protocol, procedures and informed consent template were approved by the Ethics Committee of the Municipal Hospital of Timisoara and the Ethics Committee of “Victor Babes” University of Medicine and Pharmacy Timisoara.

These 40 patients were diagnosed with lung tumours of differing sizes and intervened surgically upon, using various minimally invasive or classical surgical techniques.

The conditions for inclusion in this study were:

- Adult patients older than 18 years old at the time of study inclusion;
  - Inpatients scheduled at least 24 h before surgery;
  - Patients diagnosed by chest CT and requiring thoracic surgery for curative purposes
  - Patients who were aware of the study methods and settled to join and sign the Informed Consent Form (ICF).
  - The exclusion criteria for patients diagnosed with other invasive methods were:
  - Tomographically guided transthoracic puncture;
  - Mediastinoscopy with biopsy;
  - Fibrobronchoscopy with bronchial biopsy;
  - Positive cytological examination of the pleural fluid;
  - Supra-clavicular or latero-cervical ganglion biopsy;
  - The patient’s refusal to undergo surgery.
  - Criteria for excluding general patients:
  - Psychiatric disorders associated with poor memory status (such as psychoses, posttraumatic stress disorder, dissociative disorders or dementias) and compliance;
  - Severe cognitive deficit;
  - Metastatic cancer;
  - Patients known with various pathologies and unfavourable immediate prognosis;
  - Urgent chest surgery.
  - On the day of admission, all descriptive data were collected. 1 month after surgery, the patients completed the self-administered psychiatric questionnaires for coping, anxiety, and depression.
1. COPE Inventory: The COPE questionnaire is a valuable self-reporting means to evaluate the approaches that people utilise in coping with demanding or stressful life events; it was devised by Carver, Scheier, and Weintraub (1989).<sup>31</sup> The scale consists of 60 questions having responses graded on a scale of 1 to 4, whereby: 1 – I typically do not do this, 4 – I often do this. The questionnaire appraises 15 forms of coping; each of the 15 coping strategies

- gauged according to 4 elements. The 15 coping strategies/mechanisms, and the parameters related to each strategy, assessed by the COPE questionnaire are as follows: positive re-interpretation and growth, mental disengagement, venting of emotions, use of instrumental social support, active approach, denial, religious coping, humour, behavioural disengagement, restraint, use of emotional social support, substance use, acceptance, suppression of competing activities and planning. Greater scores denote more common use of the respective coping strategy.
2. Generalised Anxiety Disorder – 7 questionnaire (GAD-7) was made use of to identify and evaluate the manifestation and degree of anxiety disorder.<sup>32</sup> The GAD-7 scores of 0, 1, 2, and 3 correspond to the responses of “not at all”, ‘numerous days’, ‘beyond half the days’, and “nearly each day”, respectively; the scores being totalled for the 7 questions. The GAD-7 scores of 5, 10, and 15 serve as cut-offs for mild, moderate, and severe anxiety, respectively. When 10 is applied as the threshold score, GAD-7 has a specificity of 82% and a sensitivity of 89%.<sup>33,34</sup>
  3. The Patient Health Questionnaire (PHQ) is a patient-completed adaptation of the PRIME-MD diagnostic method for widespread psychiatric disorders.<sup>35</sup> PHQ-9 comprises a segment on depression, weighing parameters (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition) as “0” (never) to “3” (almost every day).<sup>36,37</sup> PHQ-9 has 61% sensitivity and 94% specificity in adults. It can establish the existence of depressive distress and the severity of depressive symptoms with its nine items. Statistical processing was affected using SPSSv17. Scores were represented by the median value and the interquartile range (the SPSS software represents the IQR as a difference between the Q3 and Q1). Comparisons between 2 data series of scores were affected using the non-parametric Mann–Whitney *U*-Test and the correlations between these types of variables were gauged by utilising the non-parametric Spearman correlation. The results were deemed to be of significance for a value of  $p < 0.05$ .

## Results

We analyzed the questionnaires, with the demographic characteristics of the 40 patients shown in Table 1. The differences between the proportions of men and women are non-significant for each demographic characteristic ( $p$  values are listed in Table 1).

We investigated the 40 patients by comparing PHQ9 and GAD7 between women and men, both pre-operatively and post-operatively at 1 month. PHQ9 values were non-significantly increased in men pre-operatively (Mann–Whitney *U*-Test,  $p = 0.861$ ), whilst being significantly increased post-operatively ( $p = 0.049$ ).

**Table 1** Demographic Characteristics of the Patients

Variable		Females	Males	$p^{(Chi2)}$
Age group	35–65	13 (72.2%)	11 (50.0%)	0.203 <sup>F</sup>
	>65	5 (27.8%)	11 (50.0%)	
Environment	Rural	6 (33.3%)	7 (31.8%)	1.000 <sup>F</sup>
	Urban	12 (66.7%)	15 (68.2%)	
Study level	High school	10 (55.6%)	10 (45.5%)	0.751 <sup>F</sup>
	University	8 (44.4%)	12 (54.5%)	
Profession	Unemployed	5 (27.8%)	7 (31.8%)	1.000 <sup>F</sup>
	Retired	13 (72.2%)	15 (68.2%)	
Marital status	Married	12 (66.7%)	18 (81.8%)	0.463 <sup>Y</sup>
	Unmarried	6 (33.3%)	4 (18.2%)	

**Abbreviations:** <sup>F</sup>, Fisher Exact Test; <sup>Y</sup>, Corrected Yate's.

GAD7 values were non-significantly increased in men pre-operatively (Mann–Whitney *U*-Test,  $p = 0.697$ ), whilst being significantly increased post-operatively ( $p = 0.042$ ).

In addition, both pre-operatively and post-operatively, anxiety as well as depression were higher in males than in females, these differences being significant even post-operatively illustrated by the data in Table 2. Post-operatively, we correlated the 15 coping mechanisms with GAD7 and PHQ9 separately for men and women as illustrated by the data in Table 3.

## Men

In men, depression significantly positively correlated with mental disengagement, turning towards instrumental social support, and seeking emotional social support.

Moreover, anxiety positively correlated with mental disengagement, denial, and seeking emotional social support.

## Women

In women, depression significantly positively correlated with behavioural disengagement as well as denial. In fact, anxiety also exhibited a similar correlation with positive interpretation, behavioural disengagement, and making use of emotional social support.

Considerable differences between the two genders – in terms of the degree of use of coping mechanisms – existed only for humour and restraint, signifying a greater usage of them by males, according to the data presented in Table 4. No significant differences were observed between the two sexes with respect to the other coping mechanisms evaluated with the COPE scale, apart from humor and abstinence.

The 15 coping mechanisms ordered by gender and descending COPE score median are represented in Table 5.

## Discussion

When considering the general population, it is widely accepted that anxiety and depression are predominant in women as compared to men.<sup>38–40</sup>

In our study, GAD 7-assessed anxiety and PHQ9-assessed depression, both pre-operatively and post-operatively, were observed to be higher in males than in females; these differences being statistically significant even post-operatively ( $p = 0.049$ , for depression;  $p = 0.042$ , for anxiety).

Our result is opposite to most existing studies on gender disparities of anxiety and depression in cancer or surgery patients; these had reported a notably higher prevalence or intensity of anxiety and depression in females relative to males, regardless of the cases being of neoplasm or surgery.<sup>5,41–44</sup>

However, there have been studies on subjects exhibiting somatic disorders, in which the differences by gender were non-significant or the intensity of depression/anxiety was lesser in females.

According to Brezinka's study involving 231 patients with myocardial infarction having undergone cardiac treatment for rehabilitation, the females exhibited added anxiety compared to men; however, any gender-related disparities in cases of depression were absent.<sup>45</sup>

**Table 2** Post-Operative Correlations of Coping Mechanism with PHQ9 and GAD7 Separately in Men and Women

Gender	PHQ9		GAD7	
	Pre-Operatory ( $p=0.861$ ) <sup>y</sup>	Post-Operatory ( $p=0.049$ ) <sup>y*</sup>	Pre-Operatory ( $p=0.697$ ) <sup>y</sup>	Post-Operatory ( $p=0.042$ ) <sup>y*</sup>
Male	4.5 (9)	7.5 (8)	4.5 (7)	5.5 (8)
Female	4.0 (6)	3.0 (5)	3.5 (5)	3.0 (5)

Note: <sup>y</sup> Mann–Whitney *U*-Test; \* significant difference.

**Table 3** Descriptive Statistics for 40 Cancer Patients (18 Males, 22 Females)<sup>x</sup>

COPE	Spearman Correlation rho Coeff. /p value	Male		Female	
		PHQ9	GAD7	PHQ9	GAD7
Positive interpretation and growth	rho	0.182	-0.027	0.322	0.484
	p	0.471	0.917	0.144	0.022*
Mental deactivation	rho	0.702	0.597	0.387	0.342
	p	0.001*	0.009*	0.075	0.119
Expression of feelings	rho	0.467	0.381	0.119	0.291
	p	0.051	0.119	0.598	0.190
Use of the social-instrumental support	rho	0.505	0.454	0.119	0.329
	p	0.033*	0.058	0.599	0.135
Active approach	rho	0.442	0.228	0.457	0.322
	p	0.066	0.363	0.087	0.092
Denial	rho	0.419	0.553	0.465	0.417
	p	0.084	0.017*	0.029*	0.053
Religious approach	rho	0.147	0.086	0.318	0.363
	p	0.560	0.733	0.149	0.097
Humour	rho	0.196	0.333	0.041	-0.084
	p	0.437	0.176	0.855	0.710
Behavioural deactivation	rho	-0.062	0.071	0.562	0.590
	p	0.806	0.779	0.006*	0.004*
Restraint	rho	0.166	0.053	0.280	0.166
	p	0.510	0.833	0.207	0.459
Use of the social-emotional support	rho	0.773	0.755	0.383	0.502
	p	<0.001*	<0.001*	0.078	0.017*
Substance consumption	rho	-	-	-0.166	-0.306
	p	-	-	0.461	0.167
Acceptance	rho	-0.198	-0.296	0.030	0.005
	p	0.431	0.233	0.894	0.982
Deletion of concurrent activities	rho	0.376	0.409	-0.008	0.116
	p	0.082	0.092	0.971	0.608
Planning	rho	0.272	0.049	0.113	0.167
	p	0.274	0.848	0.616	0.459

Notes: <sup>x</sup> Median (Interquartile Range), \* - significant correlations.

**Table 4** Degree of Use of Coping Mechanisms by Gender<sup>x</sup>

COPE	Female	Male	p value <sup>y</sup>
Planning	12 (4)	13 (3.25)	0.228
Positive interpretation and growth	12 (2)	12.5 (3)	0.590
Mental deactivation	9 (2.5)	9.5 (3.25)	0.629
Expression of feelings	10 (2.25)	9 (3.5)	0.880
Use of the social-instrumental support	12 (2.25)	12 (3.25)	0.730
Active approach	12 (4)	12 (2)	0.342
Denial	8.5 (4.25)	10 (4.25)	0.093
Religious approach	16 (3.25)	14 (4.25)	0.123
Humour	5.5 (6)	11 (7)	0.009*
Behavioural deactivation	9 (4)	10 (3.75)	0.152
Restraint	9.5 (3)	11 (4)	0.028*
Use of the social-emotional support	10.5 (4.25)	11 (6.5)	0.978
Substance consumption	4 (0)	4 (0)	0.060
Acceptance	12 (4.25)	12.5 (3.5)	0.364
Deletion of concurrent activities	11 (5)	11 (3.25)	0.402

Notes: <sup>y</sup> Mann–Whitney U-Test; \* significant difference, <sup>x</sup> Median (Interquartile Range).

**Table 5** 15 Coping Mechanisms Ordered by Gender and Descending COPE Score

COPE	Male Score	COPE	Female Score
Religious approach	14	Religious approach	16
Planning	13	Positive interpretation and growth	12
Positive interpretation and growth	12.5	Use of social-instrumental support	12
Acceptance	12.5	Active approach	12
Use of the social-instrumental support	12	Acceptance	12
Active approach	12	Planning	12
Humour	11	Deletion of concurrent activities	11
Restraint	11	Use of social-emotional support	10.5
Use of the social-emotional support	11	Expression of feelings	10
Deletion of concurrent activities	11	Restraint	9.5
Denial	10	Mental deactivation	9
Behavioural deactivation	10	Behavioural deactivation	9
Mental deactivation	9.5	Denial	8.5
Expression of feelings	9	Humour	5.5
Substance consumption	4	Substance consumption	4

A subsequent study (Grace 2005) – which comprised 661 patients suffering from acute coronary syndrome – stated that the depression prevalence was not considerably greater in the female population.<sup>46</sup>

Nonetheless, our results do concur with the findings of Van't Spijker et al's on cancer patients, whereby women were found to exhibit lower rates of emotional distress (anxiety and depression) than men.<sup>47</sup>

While preceding studies essentially indicate a greater frequency and intensity of depression and anxiety in females, relative to males, the presence of results that do not concur, or sometimes disagree, has been attempted to be justified by numerous hypotheses.

One of these premises would be that females tend to be more open than males and are more amenable to expressing states of anxiety or depression.<sup>48</sup>

In addition, men have more trouble communicating their feelings or necessity for assistance; they have a propensity to exhibit different symptoms under stress – such as fury, mania, aggression, and so on – which are in fact the symptoms of a depressive state.

The expectation of men to display strength and competitiveness, is in opposition to the possibility of showing emotions which might be perceived as weakness. Hegemonic masculinity can make it harder for men to acknowledge that they have psychological issues and hinders them from seeking help. The aptitude to request assistance when needed still appears to be associated with the female skill set.<sup>49</sup>

In the face of a cancer diagnosis, including the mandatory therapeutic procedures, though the development of depression and anxiety generally tends to be understood in women, it is commonly ignored in men.<sup>50</sup> Considering such patterns, several authors have put forward “male-specific” assessment tools, which are used in the screening for depression in male cancer patients.<sup>51</sup>

Yet, another premise would be that those men, at the beginning, perceive cancer as less menacing; this is owed, in part, to the high prevalence of prostate cancer, which is known to have a good overall prognosis.<sup>5</sup>

In our study, we estimate that the anxiety and depression assessed in the patient group are closely correlated with two major stressful events: cancer diagnosis and surgery.

Regarding coping in the non-clinical population, it is deemed that men habitually use problem-focused or instrumental strategies to handle stressful happenings, whilst women are inclined towards the use of methods meant to alter their emotional reactions to stressful circumstances.<sup>24,38,52,53</sup>

Although most studies back the predominant use of emotion-oriented coping in women compared with men,<sup>22,23</sup> some authors have not endorsed this difference among genders.<sup>24</sup>

Regarding the coping divergences with respect to gender in cancer patients, as we mentioned in the introduction, there are few studies to analyse this aspect so far. In their case, the scales used were very diverse (Ways of Coping Checklist, the Mental Adjustment to Cancer (MAC), Coping Effectiveness Scale, the brief COPE scale), such that the results observed and described are challenging to equate with one another; hence, a satisfactory synthesis of them is complicated to devise.<sup>26–30</sup>

In our study, significant differences were noted between the two sexes regarding the extent of use of coping mechanisms only for humour and restraint, in the sense of their greater use by males. No significant gender differences were found in the other coping mechanisms evaluated by COPE.

Significantly higher use of humour by men than women in our study concurs with the result obtained by Oppegaard et al in a study based on subjects with lung or gastrointestinal cancer (277 females and 293 males). Using the brief COPE, they noted that women related considerably larger use of positive reframing, religion, instrumental support, self-distraction, denial, and venting, whilst men leaned preferentially towards the directions of humour and substance use.<sup>30</sup>

Restraint, from COPE, is absent from the scales used in preceding studies but may be considered a form of active coping. In this context, our result would be contrary to previous studies that have reported in men with cancer, a generally greater tendency to use coping mechanisms of avoidance and abandonment.

As stated in his 1994 study, Fife reported that men used avoidant coping more often than women, whilst Goldzweig et al have noted in men, a hopelessness–helplessness coping manner or a fatalistic-acceptant coping disposition.<sup>26,27</sup>

According to our study, when it comes to the frequency of the types of coping mechanisms used, the religious approach was the principal coping mechanism employed by both sexes, without having any substantial difference between sexes in this regard.

The study by Fife and Jacobs-Lawson concluded that this coping mechanism was considerably more exercised by women than men.<sup>26,28</sup>

Our result corroborates, in a way, earlier research that reported religious coping as a crucial factor in cancer patients.<sup>49,54,55</sup>

Overall, studies have claimed the religious approach as empowering, whilst constituting a helpful aspect in the experience of cancer by patients.<sup>56,57</sup> Furthermore, it has been linked to diminished levels of depression and anxiety in cancer patients, in addition to improved acceptance of the disease.<sup>58–60</sup>

Indeed, it comes unanticipated that, by frequency, substance-use as a coping mechanism ranked last in both sexes. In Oppedgaard's study, this coping mechanism was much more used by men than women.<sup>30</sup>

A possible explanation for our result regarding this coping mechanism, would be the recent timing of the surgical intervention undergone by patients constituting the group, with them still being in recovery, as well as the recency of diagnosis announcement. (Surgery had also led to the diagnosis being confirmed and announced).

In men, depression correlated significantly positively with mental disengagement, making use of instrumental social support, and emotional social support, and anxiety also correlated significantly positively with mental disengagement, denial, and use of emotional social support.

In women, depression correlated significantly positively with denial and behavioural disengagement, while anxiety correlated significantly positively with behavioural disengagement, positive interpretation, and use of emotional social support.

Concrete research supports that the use of a particular style of coping varies by gender. The use of a coping style is a reaction to stress and represents a focal parameter that directly contributes to the pathogenesis of depression and anxiety amongst women.<sup>61,62</sup>

Although coping approaches that belong to the avoidant category – in handling stressful circumstances with secondary appearance of depression/anxiety – are deemed futile in both genders, emotion-focused coping strategies have shown fluctuating results.<sup>63</sup>

Positive reassessment is tied to diminished negative affects, also forming an adaptive self-adjusting approach that is focused upon emotion.<sup>64</sup>

Whilst emotion-focused coping may possess several benefits in acting in response to stressors, it also presents the drawback of heralding a psychopathological level with high functional deficiency.<sup>65</sup>

In our study, positive interpretation, and growth (a mechanism that is included in emotion-focused coping according to the COPE scale adapted to the Romanian population), has shown a significantly positive correlation with anxiety in women, and has therefore proven to be maladaptive. This denotes an individual's propensity to acquire advantage even from a traumatic situation. Consequently, the result of our study would be in line with studies that show emotion-focused strategies as being correlated with elevated levels of depression/anxiety.<sup>42,66,67</sup>

In a likewise manner, avoidant coping mechanisms (denial, behavioural and mental disengagement) have also shown association with heightened levels of anxiety and depression in both women and men.

More distinctively, mental disengagement correlated significantly positively with depression and anxiety in men, whilst behavioural disengagement did so with depression and anxiety in women. Nonetheless, denial correlated positively only with anxiety in men and depression in women.

These results concur with those mentioned in existing medical literature on cancer patients, whereby avoidant coping is found to be responsible for elevated levels of depression/anxiety.<sup>2,68–70</sup>

The use of emotional social support as a coping mechanism correlated significantly positively with both depression and anxiety in the case of men, while correlating with only anxiety in women. It is a method of coping where the individual is inclined to seek understanding, consideration or moral support from friends, relatives, as well as colleagues, so as to lessen distress. Use of instrumental social support was also significantly positively associated with the level of depression in men. In the present instance, it denotes the propensity to seek counsel and information, as well as material

assistance required in taking action to improve the situation. Though it is deemed as being a type of active coping, this mechanism, together with the use of emotional-social support, forms part of the social-support coping style, in accordance with the COPE scale version for Romania, the coping style being cited as maladaptive in a few studies on patients suffering from lung cancer or COPD.<sup>2,71,72</sup>

It should be noted that in our study, no statistically significant negative correlations were observed between the various coping mechanisms analysed with the COPE scale (version adapted to the Romanian population) and anxiety/depression. That is, no coping mechanism approached individually has been shown to be adaptive in the sense of being associated with a low level of anxiety or depression. Probably, the analysis of coping styles separated by sex would have revealed a beneficial association in this regard.

## Conclusion

The main findings of our study reveal that there were sex distinctions in the employment of coping mechanisms and the level of post-operative depression and anxiety.

The impact of depression and anxiety is different depending on the patient's gender. The patient's gender determines the coping style, which in turn influences the post-operative evolution and the subsequent socio-professional re-insertion.

Also, certain coping mechanisms in both men and women correlated significantly positively with the intensity of depression/anxiety, proving, in this context, maladaptive in the control of these mental states.

## Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of "Victor Babes" University of Medicine and Pharmacy Timisoara, Romania (protocol code no. 24 and date of approval 28.09.2018) and by the Ethics of Municipal Clinical Emergency Hospital of Timisoara (protocol code G-2737 and date of approval 25.09.2018).

## Data Sharing Statement

The data presented in this study are available upon request from the corresponding author. The data are not publicly available because the database contains patient personal data.

## Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

## Disclosure

The authors report no conflicts of interest in this work.

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