

# Coping styles and pain level in lung cancer patients: The mediating role of stress level and the moderating role of place of residence and gender<sup>1</sup>

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**Abstract:** *Introduction:* Lung cancer is a type of cancer that negatively and strongly affects mental and physical functions. It is characterized by specific symptoms, including emotional ones, i.e. high levels of stress, feelings of insecurity and loss of security. These emotional effects can directly debilitate individuals, thereby increasing the risk of depression and anxiety disorders. The present study examined the variables that determine the psychological functioning of people with lung cancer. *Aim of the study:* This study examined the relationships between coping styles, stress levels and pain levels in lung cancer patients and whether these relationships were moderated by place of residence. *Methods:* A sample of 97 lung cancer patients completed questionnaires measuring coping styles (the Coping with Stress Inventory), perceived stress levels (the Perceived Stress Scale) and pain levels (the McGill Brief Pain Questionnaire). *Results:* Emotion-focused coping style was positively associated with higher levels of stress and pain, while task-focused coping style was negatively associated with it. Stress level fully mediated the association between emotion-focused coping and pain. The associations between emotion-focused coping, stress and pain were stronger in patients living in small towns than in patients from larger cities. *Conclusions:* An emotion-focused way of coping increases patients' stress levels, which in turn increases pain perception. This relationship is clear among patients from rural areas and small towns. The task-oriented approach is associated with lower stress. Stress acts as an explanatory mechanism for how different coping strategies affect pain perception. The results underscore the importance of interventions to improve coping skills, especially for rural patients who may have less access to medical resources and support. Shifting from an emotion-focused coping style to a task-focused coping style may help reduce stress and alleviate pain in patients with lung cancer.

**Keywords:** coping styles, lung cancer, stress

## 1. Introduction

Lung cancer is a type of cancer that negatively and strongly affects mental and physical functions (Malhotra, Malvezzi, Negri, La Vecchia & Boffetta, 2016). It is difficult to detect, and due to its location, it is characterized by specific symptoms, including emotional ones, i.e. high levels of stress, feelings of insecurity and loss of security (Zabora, Brintzenhofszoc, Curbow, Hooker & Piantadosi, 2001). These emotional effects can directly weaken an individual's defense mechanisms, thus increasing the

risk of depression and anxiety disorders (Van Den Hurk, Schellekens, Molema, Speckens & Van Der Drift, 2015). The literature notes that depression and anxiety in the course of cancer can exacerbate cancer symptoms (Chen, Tsai, Wu & Lin, 2015).

Studies show that coping styles mediate between perceptions of a situation as stressful (Surman & Janik, 2017) or stressful life events before cancer and perceptions of distress (Biggs, Brough & Drummond, 2017). Cancer pain has a significant impact

1 Article in Polish language: [https://stowarzyszeniefidesetratio.pl/fer/63P\\_Pore.pdf](https://stowarzyszeniefidesetratio.pl/fer/63P_Pore.pdf)

on cancer patients' quality of life, affecting physical, psychological and spiritual aspects (Chen et al., 2015). Much of the interest in coping stems from the observation that patients, when faced with persistent cancer pain, exhibit quite varied responses. In contrast, other patients cope poorly, report high levels of pain and feel depressed (Prasertsri, Holden, Keefe & Wilkie, 2011).

One approach to studying coping involves focusing on coping strategies, i.e., the specific efforts individuals make to cope with a particular stressful event (such as pain) (Prasertsri et al., 2011). Studies have shown significant differences between groups in terms of preoccupation with anxiety, denial/avoidance, fighting spirit, and feelings of hopelessness. In fact, in line with previous studies (Erhunmwunsee, Joshi, Conlon & Harpole, 2012), patients with low pain levels showed a significantly greater presence of fighting spirit, a strategy defined by optimism and determination to overcome the disease (Szymona-Palkowska i in., 2016). The perception of pain control reduces pain-related stress and subsequently leads to improved functional status (Postolica, Iorga, Petrariu & Azoicai, 2017). Milfont and team (2021) showed that certain coping styles were associated with pain intensity (Milfont, Abrahamse & MacDonald, 2021).

A second, more recent approach to studying stress coping is to focus on coping styles. The findings of Prasertsri and team (2011) revealed a consistent pattern of between-group differences in pain quality, coping strategies and depression through coping styles. Compared to patients in the high anxiety group, patients in the repressive coping style group reported significantly less pain across multiple pain quality indicators and fewer depressive symptoms. Another important finding of this study was that patients in the repressive pain coping style group reported significantly less involvement in catastrophizing pain than patients in the defensive high anxiety group. Based on this, the following hypothesis is formulated:

- H1. Coping styles are associated with pain levels:  
H1.1: Task-oriented coping reduces pain levels,  
H1.2: Emotion-oriented coping increases pain levels,

- H1.3: Avoidance-oriented coping increases pain levels.

Coping styles are related to the process by which stress occurs, as well as to a number of other factors that modify the relationship with stress and which are often treated as variables (Postolica et al., 2017). Studies have shown that coping styles related to fighting spirit, acceptance and positive evaluation were the most adaptive to recovery among cancer patients (Ellis, Lloyd, Wagland, Bailey & Molassiotis, 2013). The concept of coping style does not emphasize total constancy or rigidity in the process of coping with stress. Therefore, in the context of cancer, coping style should be understood as a type of disposition that is flexible and allows the individual to change strategies and adapt them to specific conditions (Wright i in., 2020). A recent study of patients diagnosed with lung cancer indicates that they most often activate adaptive coping methods to cope with the stress caused by the disease (van Montfort i in., 2020). A task-focused style predominates, while an avoidance- or emotion-focused style is less common. It is indicated that patients who use task-focused strategies are less likely to feel helpless. Other studies have shown that the coping style used by people cured of cancer can be a predictor of their quality of life (Wenninger i in., 2013). Thus, it can be assumed that:

- H2: Coping styles are related to stress levels:  
H2.1: Task-oriented coping reduces stress levels,  
H2.2: Emotion-oriented coping increases stress levels,  
H2.3: Avoidance-oriented coping increases stress levels.

Research points to the complexity of the pain phenomenon and its relationship to stress. According to the "gate control" theory, pain is a complex phenomenon involving sensory-discrimination, cognitive-motivational and affective-motivational dimensions that are processed in parallel (Katz & Rosenbloom, 2015). It directly affects an individual's functioning through impairment. In the transactional model, pain can be both a negative effect of the stress coping process and its cause (Obbarius, Fischer, Liegl, Obbarius & Rose,

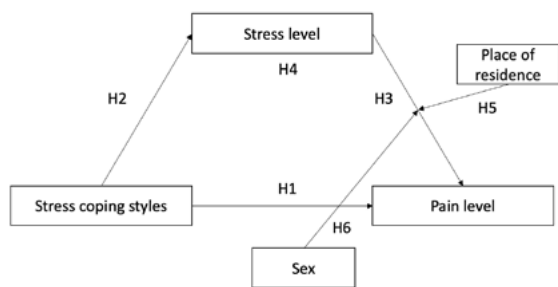


Figure 1. Stress level as a mediator of the relationship between coping styles and pain levels, and place of residence, and sex as moderators of mediation.

2021). By the authors of the concept, pain is treated as a somatic manifestation of difficulties resulting from psychological tension (Lazarus & Folkman, 1987). Research indicates that pain is associated with the experience of emotional states (Dueñas, Ojeda, Salazar, Mico & Failde, 2016). Emotions such as anxiety or sadness lower the pain threshold (Li, Liu, Hu & Meng, 2020), whereas a sense of security can raise it (Yang & Chang, 2019). Undoubtedly, cancer causes significant psychological suffering in patients (Dueñas et al., 2016). Previous studies have shown that the presence of pain in cancer patients is associated with mood disturbances (Šprah & Šoštarič, 2004) and constitutes both suffering in itself and a reflection of the significance of the disease (Khemiri et al., 2019). It can therefore be postulated that:

- H3: Stress level is related to pain level.
- H4: Stress level mediates the relationship between coping styles and pain.

Sociodemographic factors may also be significant. Patients from rural areas are less likely to receive radiotherapy and chemotherapy (Koopman, Hermanson, Diamond, Angell & Spiegel, 1998), and place of residence affects access to surgical treatment (Johnson, Hines, Johnson & Bayakly, 2014). Research indicates that people living in rural areas more frequently experience depression and anxiety (Forrest, Adams, Wareham, Rubin & White, 2013; Tsaras et al., 2018), which partly explains their limited access to healthcare (Ell et al., 2005). Furthermore, it has been shown that cancer patients living in rural areas and small towns have lower levels of disease

acceptance compared to those living in larger cities (Arcury, Preisser, Gesler & Powers, 2005) and are less well-adjusted to their illness (Czerw, Religioni, Deptała & Walewska-Zielecka, 2016). However, the significance of place of residence in relation to pain in cancer patients remains unclear. A study conducted by Krajewski and colleagues found that patients from rural areas had significantly higher pain relief scores compared to patients from larger cities, while other studies suggest the opposite (Krajewski et al., 2018). Considering these conflicting reports, it is assumed that:

- H5: Place of residence moderates the indirect relationship between coping styles and pain through stress.

Considering these diverse findings, it is evident that gender may moderate the indirect relationship between coping styles and pain through stress. Previous research consistently shows that women with cancer report higher levels of psychological distress, more frequently use emotion-focused coping strategies, and experience greater pain intensity compared to men (Miaskowski, 2004; Zhou, Wang, Chen & Li, 2023). In contrast, men are more likely to engage in task-focused strategies, which are associated with lower emotional reactivity and better pain adaptation (Gazerani, Aloisi, & Ueda, 2021). These gender differences in coping tendencies may influence the strength and direction of the indirect effect of coping style on pain through stress. For example, emotion-focused strategies are linked to heightened physiological arousal and increased pain perception, particularly in women (Unruh, 1996), whereas task-focused strategies may more effectively attenuate the stress–pain relationship in men. Consequently, it is hypothesized that:

- H6: Gender moderates the indirect effect of coping styles on pain through stress.

Taking into account both psychological variables, such as coping styles and stress levels, and socio-demographic factors, such as gender and place of residence, the presented research model (see Figure

1) allows for a better understanding of the mechanisms influencing pain perception in patients with lung cancer.

## **2. Methodology of the present study**

The aim of the study was to determine the relationship between coping styles and pain levels in patients with lung cancer. The independent variable was coping style (task-oriented, emotion-oriented, avoidance-oriented), while the dependent variable was pain level. Stress was assigned the role of mediator, whereas place of residence and gender served as moderators.

The study used a diagnostic survey method, using the following research tools:

1. *Stress coping styles.* This variable was measured using Endler and Parker's (1990) Coping with Stress Inventory (CISS). The Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1990) measures three coping styles – task-oriented (TOS), emotion-oriented (EOS), and avoidant style (AS) – via 48 items (16 per subscale, scored 16–80). In the present study, Cronbach's  $\alpha$  ranged from 0.84 (EOS) to 0.90 (TOS), indicating high internal consistency.
2. *Level of stress.* This variable was measured using the Perceived Stress Scale (PSS-10; Cohen et al. 1983), a 10-item instrument scored from 0 to 40, with higher scores reflecting greater perceived stress. In this study, Cronbach's  $\alpha$  was 0.91, indicating high internal consistency.
3. *Pain level.* This variable was measured using the Short-Form McGill Pain Questionnaire (SF-MPQ; Melzack, 1987), comprising 15 descriptors rated on a 4-point scale (0–3). Total scores are obtained by summing all item ratings. In this study, Cronbach's  $\alpha$  was 0.91, indicating high internal consistency.

The study included oncology patients diagnosed with lung cancer who were hospitalized at the Independent Public Clinical Hospital No. 4 in Lublin..

Ninety-seven respondents participated in the study, including 50 men (51.5%) and 47 women (48.5%). The respondents ranged in age from 35 to 84 years (SD: 7.822, min: 35, max: 84), and the mean age was 64.84 years. The differentiating factor among respondents was the time since diagnosis (up to 36 months: 19.3%; 37–60 months: 71.6%; more than 60 months: 9.1%). Regarding the type of cancer, the majority were diagnosed with non-small cell lung cancer (83.5%), while the remaining 16.5% had small cell lung cancer. Almost all participants had undergone at least one course of chemotherapy (96%), whereas a minority had not received this type of treatment (4%). Only a subset of respondents received radiotherapy (16.5%) and surgical treatment (9%), while the majority had not undergone radiotherapy (83.5%) or surgical treatment (91%). On average, participants received 4.47 courses of chemotherapy (SD = 2.26, range: 1–9). Regarding smoking status, half of the respondents reported being current smokers (50.5%), while the other half were non-smokers.

Data were collected during individual and direct contact with cancer patients. The survey lasted between 30 and 60 minutes.

## **3. Results**

The multiple mediation model (Figure 1) was tested using Hayes' (2022) PROCESS macro (Model 16) with summary scores for the items of Stress Coping Styles, Stress Level, Pain Level. The analysis assessed (1) the effect of Stress Coping Styles on Pain Level, (2) the effect of the dimensions of Stress Coping Styles on Stress Level, and (3) the effect of Stress Level on Pain Level. A 95% confidence interval with bias correction from 5000 resamples was generated using the initial loading method with bias correction to assess the statistical significance of correlations and effects.

Analysis of the data showed that stress levels were statistically significantly correlated with coping styles, in aspects other than task-oriented style (95% CI = [-0.49; -0.13]), emotion-oriented style (95% CI = [0.60; 0.80]), which partially supports hypothesis H2. As expected, a positive correlation

Table 1. Means, standard deviations, and Pearson's r correlations between variables for the whole sample

	Variable	M	SD	1	2	3	4
Whole sample	1. TOS	56.70	9.43	-			
	2. EOS	38.29	9.25	-.25**	-		
	3. AS	44.65	5.83	.06	.03	-	
	4. Stress level	17.33	6.64	-.32**	.72**	-.06	
	5. Pain level	5.99	12.07	-.16	.30**	-.06	.30**
Small city and village	1. TOS	54.30	9.80	-			
	2. EOS	38.75	9.25	-.02	-		
	3. AS	44.45	5.90	.10	.13	-	
	4. Stress level	18.15	6.89	-.13	.70**	-.22	
	5. Pain level	7.70	13.41	-.13	.47**	.02	.47**
Large city	1. TOS	60.20	7.87	-			
	2. EOS	37.48	9.37	-.64**	-		
	3. AS	45.03	5.84	-.04	-.09	-	
	4. Stress level	16.20	6.23	-.57**	.74**	.20	
	5. Pain level	2.50	6.22	-.06	-.16	-.21	-.22

p < 0.05; \*\* p < 0.01; TOS- task-oriented style, EOS- emotion-oriented style, AS- avoidant style

was found between emotion-oriented style and pain level (95% CI = [0.11; 0.48]), partially supporting hypothesis H1. Positive correlations were also obtained between the level of stress and the level of pain (95% CI = [0.10; 0.47]), supporting hypothesis H3.

We also tested whether there were differences between residents of smaller and larger towns in the variables measured in this study. The results of the t-test showed that residents of smaller and larger cities did not differ significantly in terms of emotion-oriented style ( $t(96) = 0.66, p = 0.510$ ), avoidant style ( $t(96) = -0.48, p = 0.635$ ), stress level ( $t(96) = 1.41, p = 0.142$ ). We observed a higher task style in residents of large cities (6.20 (SD = 7.87) vs. 54.30 (SD = 9.40),  $t(96) = -3.15, p < 0.01, d = 0.65$ ), and a higher pain level in residents of rural areas and small towns (7.70 (SD = 13.41) vs. 2.50 (SD = 6.22),  $t(96) = 2.28, p < 0.05, d = 0.47$ ).

Independent samples *t*-tests were conducted to examine sex differences across various variables. Results showed no significant difference in task-focused style between women (M = 55.34, SD = 10.44) and men (M = 57.98, SD = 8.27),  $t(95) = -1.38, p = .085$ , with a small effect size,  $d = -0.28$ . In con-

trast, women scored significantly higher than men in emotion-focused style (M = 41.11, SD = 9.81 vs. M = 35.62, SD = 7.89),  $t(95) = 3.04, p = .003, d = 0.62$ , indicating a medium effect. No significant difference was observed for avoidance style, with women (M = 43.72, SD = 4.96) and men (M = 45.52, SD = 6.47),  $t(95) = -1.53, p = .13, d = -0.31$ . Women reported significantly higher pain levels (M = 10.11, SD = 15.59) than men (M = 2.12, SD = 5.06),  $t(95) = 3.44, p < .001, d = 0.70$ , reflecting a medium to large effect. Similarly, women had significantly higher overall stress scores (M = 19.63, SD = 6.95) compared to men (M = 15.22, SD = 5.63),  $t(95) = 3.43, p < .001, d = 0.70$ , indicating a medium effect.

The next step was a mediation analysis, in which we examined the mediation effect using the bootstrap method. The mediation effect was tested only for significant relationships between aspects of coping styles and pain levels. We investigated whether stress level mediates the relationship between emotion-oriented coping styles and patients' pain levels. A moderated mediation analysis was conducted using PROCESS Model 16 (Hayes, 2022) to test whether stress medi-

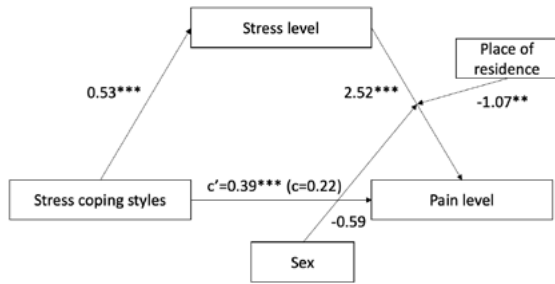


Figure 2. Mediation model of the relationship between emotion-oriented style and pain level. Annotation. The figure shows unstandardized coefficients; c'-direct effect of X to Y; c-direct effect of X to Y with mediator in the model; \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

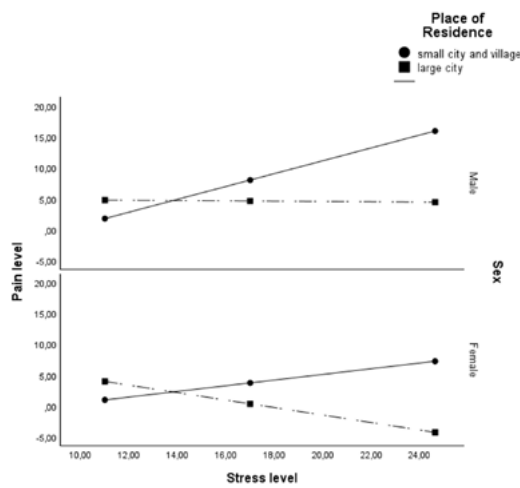


Figure 3. Moderating role of place of residence in the relationship between stress and pain levels.

ates the relationship between the emotion-focused coping style (SSE) and pain level, and whether this mediation is moderated by place of residence and sex.

First, SSE significantly predicted stress,  $b = 0.5274$ ,  $SE = 0.0533$ ,  $t(93) = 9.89$ ,  $p < .001$ , explaining approximately 51.3% of the variance in stress,  $R^2 = .513$ ,  $F(1, 93) = 97.86$ ,  $p < .001$ . Next, the overall model predicting pain level from SSE, stress, place of residence, sex, and their interactions was significant,  $R^2 = .307$ ,  $F(6, 88) = 6.49$ ,  $p < .001$ . Stress significantly predicted pain,  $b = 2.52$ ,  $SE = 0.65$ ,  $t(88) = 3.89$ ,  $p = .0002$ , as did place of residence,  $b = 14.79$ ,  $SE = 5.72$ ,  $t(88) = 2.58$ ,  $p = .011$ . The interaction between stress and place of residence was significant,  $b = -1.07$ ,  $SE = 0.32$ ,  $t(88) = -3.37$ ,  $p = .0011$ , indicating moderation. The interaction between

stress and sex was marginally significant,  $b = -0.59$ ,  $SE = 0.33$ ,  $t(88) = -1.80$ ,  $p = .076$ . The direct effect of SSE on pain was not significant,  $b = 0.20$ ,  $SE = 0.16$ ,  $t(88) = 1.24$ ,  $p = .22$ . Conditional indirect effects of SSE on pain via stress varied depending on place of residence and sex. Significant positive indirect effects were found for males living in small cities or villages (*indirect effect* = 0.45, 95% CI [0.08; 0.80]), whereas for males in large cities, the indirect effect was significant and negative (*indirect effect* = -0.42, 95% CI [-0.84; -0.09]). For females, indirect effects were non-significant regardless of place of residence. Indices of moderated mediation confirmed significant moderation by place of residence (*index* = -0.57, 95% CI [-0.91; -0.20]) and a marginal effect for sex (*index* = -0.31, 95% CI [-0.67; 0.01]). These results suggest that stress mediates the effect of the emotion-focused coping style (SSE) on pain levels, but this mediation is moderated by place of residence and, to a lesser extent, sex. Specifically, the indirect effect of SSE on pain via stress is significant and positive for rural males but reverses for urban males, indicating a complex interaction. The direct effect of SSE on pain is not significant, highlighting the importance of stress as a mediator. Overall, the moderated mediation model is supported, confirming that the relationship between SSE, stress, and pain depends on both place of residence and sex.

#### 4. Discussion

The present study provides compelling evidence that coping strategies and subjective pain perception play a significant role in shaping stress levels among lung cancer patients. Consistent with hypothesis H1.2, pain levels increased with greater reliance on emotion-oriented coping, whereas no relationship emerged between pain and either task-oriented or avoidance-oriented coping (H1.1, H1.3). Emotion-focused coping is widely regarded as a less adaptive strategy because it emphasizes managing emotions rather than addressing the source of distress, which can exacerbate the subjective perception of pain. Our results are consistent with the findings of Ośmiałowska and colleagues (Ośmiałowska, Misiąg,

Chabowski & Jankowska-Polańska, 2021), who showed that cancer patients use maladaptive coping strategies more frequently the greater the pain they experience. In contrast, regarding adaptive coping strategies, the level of pain did not show statistically significant differences regardless of the extent to which the adaptive strategy was employed.

With regard to stress, levels decreased with higher scores for task-oriented coping (H2.1) and increased with higher scores for emotion-oriented coping (H2.2), while no statistically significant association was observed for avoidance-oriented coping. These results are consistent with previous research, which indicates that patients using task-oriented strategies feel less helpless (Katz & Rosenbloom, 2015) and exhibit lower levels of depressive symptoms (Kulpa & Stypuła-Ciuba, 2014). In contrast, emotion-oriented coping is associated with avoidance of helplessness and preoccupation with anxiety (Du, Lin, Johnson, & Altekruze, 2011). Similarly, Di Giuseppe et al. (2018) found that lung cancer patients who perceived their illness as a threat, loss, harm, or significant event experienced elevated stress levels, which may be related to defensive mechanisms.

The positive association between stress and pain (H3.1) confirms that pain and elevated stress are mutually reinforcing, which intensifies their subjective impact and diminishes patients' quality of life (Du et al., 2011). It was observed that higher levels of pain are associated with increased stress among patients. Studies in breast cancer populations have similarly shown that persistent pain is linked to depressive symptoms and negative affect (Biparva et al., 2023; Leeuw et al., 2007). A key finding of the present study is the significant moderated mediation effect of place of residence (H5) in the pathway from emotion-focused coping to pain through stress. Specifically, the mediation effect was stronger among patients living in rural areas or small towns than among those in urban settings, where the relationship was no longer significant. These results are consistent with research indicating that rural cancer patients more frequently experience higher psychological distress and lower acceptance of illness, likely due to limited access to psychosocial support and healthcare resources (Sharp, Poulaliou, Thompson, White, & Wood,

2014). Such disparities highlight the potential role of structural and environmental factors in shaping the stress–pain relationship.

The results also provide partial support for hypothesis H6, which proposed that sex would moderate the mediation process. Although the moderation effect of sex did not reach conventional statistical significance, the pattern of conditional indirect effects suggests potentially meaningful trends. Among men, the indirect effect of emotion-focused coping on pain via stress was positive in rural areas but reversed in urban settings. Among women, no significant indirect effects were observed, regardless of place of residence. These trends are consistent with the literature showing that women typically report higher levels of stress and pain and more frequent use of emotion-focused coping (Gazerani, Aloisi, & Ueda, 2021; Unruh, 1996), whereas men may benefit more from task-oriented coping, particularly in urban environments rich in resources.

Overall, these findings point to a complex, context-dependent interplay between coping strategies, stress, pain, sex, and place of residence in lung cancer patients. They underscore the need for personalized psychosocial interventions that not only promote adaptive coping but also address structural and demographic factors that shape psychological and physical outcomes.

## 5. Limitations and future directions

Several limitations of this study should be acknowledged. First, the cross-sectional design precludes causal inferences about the relationships among coping styles, stress, and pain. Longitudinal research is needed to clarify the temporal sequence of these variables and to determine whether changes in coping styles lead to measurable improvements in stress and pain outcomes. Second, all variables were assessed through self-report measures, which may be subject to recall bias and social desirability effects. Incorporating objective indicators of stress (e.g., cortisol levels) and clinical pain assessments could enhance the validity of future research.

Third, although the sample size was sufficient for the planned analyses, it limits the generalizability of the findings – particularly for subgroup analyses by sex and place of residence. Larger, more diverse samples are needed to confirm the observed interaction patterns and to explore potential cultural or regional variations. Fourth, the study did not control for potential confounding variables such as comorbidities, cancer stage, or ongoing treatment regimens, all of which could influence coping, stress, and pain perception.

Future research should adopt multi-method, longitudinal designs to investigate the dynamic interplay between coping strategies, stress, and pain over the course of the disease trajectory. It would also be valuable to assess the effectiveness of targeted psychological interventions – such as cognitive-behavioral therapy or mindfulness-based stress reduction – tailored to patients' coping profiles and socio-demographic contexts. Finally, given the potential moderating effects of structural factors such as healthcare accessibility, future studies should integrate geographical and socioeconomic data to inform the development of equitable, context-sensitive supportive care strategies.

## **6. Conclusion**

The present study, together with evidence from previous research, indicates that among lung cancer patients, elevated stress levels are associated with greater pain intensity. A noteworthy finding is the moderating role of place of residence – an often-overlooked demographic factor in psychosocial oncology research – suggesting that contextual and environmental variables may meaningfully shape the stress–pain relationship.

Results of own research also point to a potential moderating role of sex, although this effect was marginally significant. Women in our sample reported significantly higher stress and pain levels, as well as greater use of emotion-focused coping strategies, compared to men. These differences are consistent with prior studies showing that women tend to exhibit stronger affective responses to illness-related stressors, which may heighten pain perception, whereas men are more likely to adopt task-focused coping, which can buffer stress-related pain. Although the interaction effects in our analysis did not reach full statistical significance, the observed trends highlight the importance of considering sex differences when developing psychosocial interventions for cancer patients.

Among the patients in the study group, the majority received at least four cycles of chemotherapy. Numerous authors have indicated that lung cancer patients are particularly susceptible to chemotherapy-related adverse somatic symptoms. This may be associated with the occurrence of pain as a side effect of chemotherapy on the gastrointestinal, skeletal, circulatory, or urinary systems. Pain clearly manifests as an effect of disease-related stress. Social support plays a crucial role in coping with cancer (Usta, 2012). Early contributions to this understanding of social support came from Cassel and Cobb (Carveth & Gottlieb, 1979), who highlighted that this variable acts as a buffer against stress levels. They also emphasized the importance of interpersonal relationships as a moderator of the potential threatening effects of stress on an individual's functioning. Social support sustains or encourages actions that promote beneficial adaptation.



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