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RESEARCH ARTICLE / ARAŞTIRMA YAZISI

Relationships Among Prolonged Grief, Post-Cancer Growth, and Self-Compassion in Patients with Lung Cancer

Akciğer Kanseri Hastalarinda Uzun Süreli Yas, Kanser Sonrası Gelişme ve Öz-Şefkat Arasindaki İlişki

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Abstract:

This study investigated the relationships among self-compassion, prolonged grief, and post-cancer growth in patients with lung cancer. With a quantitative and cross-sectional research model, 100 patients with lung cancer from the Medical Oncology Clinic of Yedikule Hospital were evaluated. Data were collected using sociodemographic and medical forms, the Prolonged Grief Disorder Scale, the Cancer Empowerment Scale, and the Self-Compassion Scale. The results showed that there were significant negative correlations between prolonged grief and cancer empowerment and self-compassion. In contrast, self-compassion showed significant positive correlations with cancer empowerment and its dimensions of personal power and social support. These findings suggest that high self-compassion is associated with reduced prolonged grief and increased empowerment, highlighting its importance in the psychological well-being and adjustment of lung cancer patients. This study emphasizes the need for psychological interventions that promote self-compassion to improve quality of life and treatment adherence in this patient population.

Keywords: Prolonged grief, post-cancer growth, self-compassion, lung cancer, psycho-oncology.

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Öz:

Bu çalışmada akciğer kanseri hastalarında öz-şefkat, uzun süreli yas ve kanser sonrası gelişme arasındaki ilişki araştırılmıştır. Nicel ve kesitsel bir araştırma modeli kullanılarak, Yedikule Hastanesi Tıbbi Onkoloji Kliniği'nden 100 akciğer kanseri hastası değerlendirilmiştir. Veriler sosyo-demografik form, Uzamış Yas Ölçeği, Kanser Güçlendirme Ölçeği ve Öz-Şefkat Ölçeği kullanılarak toplanmıştır. Sonuçlar, uzamış yas ile kanser güçlendirme ve öz-şefkat arasında anlamlı negatif korelasyonlar olduğunu göstermiştir. Buna karşılık, öz-şefkat kanser güçlendirme ve onun alt boyutları olan kişisel güç ve sosyal destek ile anlamlı pozitif korelasyonlar göstermiştir. Bu bulgular, yüksek öz-şefkatin uzun süreli yasın azalması ve güçlendirmenin artmasıyla ilişkili olduğunu ortaya koymakta ve akciğer kanseri hastalarının psikolojik esenliği ve uyumundaki önemini vurgulamaktadır. Bu çalışma, bu hasta popülasyonunda yaşam kalitesini ve tedaviye uyumu iyileştirmek için öz-şefkati teşvik eden psikolojik müdahalelere duyulan ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: Uzamış yas, kanser sonrası gelişme, öz-şefkat, akciğer kanseri, psiko-onkoloji.

Introduction

According to 2022 data from the World Health Organization, there were 240,013 new cancer diagnoses in Turkey, including 33,039 cases of lung cancer. In 2020, lung cancer was responsible for 18% of all cancer-related deaths while it accounted for 11.4% of all newly diagnosed cases according to data from the Global Cancer Observatory (Shobaki & Butani, 2022; Raksasri et al., 2023). Lung cancer patients often experience significant psychiatric and psychological challenges, including anxiety, depression, and prolonged grief, which are exacerbated by the stigma associated with smoking and the fear of mortality (Williamson et al., 2022). Research highlights that depression and anxiety are widespread among lung cancer patients, primarily due to the physical impact of the illness, treatment-related side effects, and significant disruptions to their everyday lives (Garcia et al., 2021). Prolonged grief, particularly following a difficult diagnosis or prognosis, can lead to chronic emotional distress, negatively affecting patients' ability to cope with treatment (Golden, 2013). These psychological problems not only diminish the quality of life but can also interfere with treatment adherence and overall prognosis (Kroenke et al., 2013). Given these psychological challenges, social support is a crucial factor in helping patients manage stress and navigate the emotional burden of the disease.

Social support, providing both emotional and practical aid during treatment, is considered one of the most effective means to help patients cope with stress and facilitate recovery (Pasek et al., 2021). Patients with strong social support systems are less likely to experience feelings of hopelessness and loneliness, common in those struggling with cancer (Pehlivan et al., 2012). The presence of family and friends can help patients find positive meaning in their experiences and foster psychological resilience, enhancing their ability to adapt to the physical and emotional burdens of lung cancer (Schroevers et al., 2010; Frambes et al., 2018). Research further indicates that cancer patients greatly value friendship and empathy, emphasizing the significance of creating supportive relationships to enhance mental well-being and overall quality of life (Korotkin et al., 2019; Luszczynska et al., 2013). Enhancing social support through interventions can significantly boost well-being, making it a key focus alongside psychological resilience and self-compassion (Corovic et al., 2023). Robust social support is also essential in alleviating the symptoms of prolonged grief disorder in lung cancer patients, as it can help reduce feelings of isolation and despair while encouraging emotional recovery and strengthening psychological resilience during and after treatment (Pease et al., 2015). However, in addition to the vital role of social support in managing stress and grief, internal psychological factors such as resilience and self-compassion are also crucial in aiding emotional recovery and facilitating post-cancer growth.

Prolonged grief syndrome is characterized by a persistent and intense grieving process that can severely impact both psychological and physical health. The literature indicates that prolonged grief may contribute to the development of chronic illnesses, including lung cancer, due to the prolonged stress associated with grief (O'Connor, 2019). This stress can weaken the immune system and promote inflammatory responses, creating an environment conducive to cancer progression (Schuler et al., 2014; Lichtenthal et al., 2015). Moreover, individuals experiencing prolonged grief syndrome are at a higher risk of developing psychological problems including anxiety and depression, which can contribute to harmful behaviors such as smoking, thereby increasing the likelihood of lung cancer (Williamson et al., 2022; Stroebe et al., 2007).

The capacity for psychological resilience, which involves adapting to stress and hardship, is crucial for lung cancer patients in handling the emotional and physical difficulties associated with their illness. High resilience allows patients to cope with intense emotions like grief and sorrow, reducing their psychological burden. It also supports post-cancer growth, enabling patients to adjust to new realities and find personal meaning in their experiences (Matzka et al., 2016; Ye et al., 2017). Self-compassion further strengthens resilience by encouraging kindness toward oneself and alleviating feelings of guilt or stigma, particularly in lung cancer patients who may feel regret about smoking (Williamson et al., 2022). Resilience and self-compassion not only help patients cope with grief but also serve as key contributors to post-cancer growth.

Post-cancer growth, defined as the personal development and meaning found in overcoming a cancer diagnosis, is a key aspect of recovery. Psychological resilience and self-compassion play central roles in supporting this growth by helping patients adapt to changes in their lives and find strength in the course of their cancer experiences (Matzka et al., 2016; Ye et al., 2017). Together, resilience and self-compassion help patients navigate prolonged grief,

facilitating both emotional recovery and post-cancer growth (Garcia et al., 2021).

Self-compassion is a crucial psychological resource for lung cancer patients, helping them manage the physical and emotional challenges of the disease, including guilt and stigma. Research shows that high self-compassion reduces anxiety, depression, and self-blame while fostering resilience and psychological flexibility, reducing stigma, and improving adaptation to treatment, making it a key target for psycho-oncological care (Williamson et al., 2022; Roberts et al., 2009; Garcia et al., 2021).

The present study is important because it addresses the critical interaction among prolonged grief, post-cancer growth, and self-compassion in lung cancer patients, a population that faces unique psychological challenges, including stigma and high mortality rates (Williamson et al., 2022). Although previous studies examined these factors separately, there is a noticeable gap in the literature in terms of understanding how they interact to affect long-term emotional recovery and well-being in lung cancer patients (Matzka et al., 2016; Ye et al., 2017). This study addresses that gap by investigating the role of self-compassion in reducing the harmful effects of prolonged grief and promoting post-cancer growth, offering important insights for the development of targeted psychological interventions (Garcia et al., 2021). By examining how self-compassion interacts with prolonged grief and post-cancer growth, this study provides guidance for the development of targeted psychological interventions that can improve the quality of life of lung cancer patients. To explore this interaction, the following hypotheses are investigated:

H1: There is a negative correlation between self-compassion level and prolonged grief disorder in patients with lung cancer.

H2: There is a positive correlation between self-compassion level and post-cancer growth in patients with lung cancer.

Methods

The research presented here was approved by the Yeditepe University Research Ethics Committee (decision number E.50532705-050.06-400). All participants provided informed consent prior to their involvement in the study. The research was carried out in compliance with the principles outlined in the Declaration of Helsinki.

A quantitative, cross-sectional, and correlational survey model was employed to investigate the relationships among prolonged grief, post-cancer growth, and self-compassion in patients with lung cancer. Correlational research models help researchers understand interactions between different variables by identifying all observable relationships (Creswell, 2014).

The participants included 100 lung cancer patients from the Yedikule Hospital Medical Oncology Clinic. Participants' ages ranged between 35 and 78 years with an average age of 62.08 years (SD = 8.48). An overview of the patients' sociodemographic and medical data is provided in Table 1.

Table 1. *Participants' sociodemographic and medical information*

N= 100			
Variables		**F**	**%**
Gender	Female	21	21.00
	Male	79	79.00
Marital Status	Married	74	74.00
	Single	13	13.00
	Divorced/Widowed	13	13.00
Education Level	Elementary school/Illiterate	655	88.50
	Middle school	53	7.20
	High school and above	32	4.30
Parental Status	Yes	696	5.90
	No	44	94.10
Cancer Stage	Stage 1	14	14.00
	Stag 2	7	7.00
	Stage 3	23	23.00
	Stage 4	10	10.00
	Unknown	46	46.00
Lung Cancer Type	Small cell	19	19.00
	Non-small cell	13	13.00
	Other	68	68.00
Time Since Diagnosis	1 year	65	65.00
	1-3 years	26	26.00
	More than 3 years	8	8.00

Treatment Received	Chemotherapy	19	19.00
	Radiotherapy	6	6.00
	Radiotherapy and chemotherapy	44	44.00
	Chemotherapy and surgical procedures	8	8.00
	Radiotherapy and surgery	1	1.00
	Chemotherapy, radiotherapy, and surgery	16	16.00
	Other	3	3.00
Reason for the Medical Appointment Leading to Diagnosis	Coincidence	19	19.00
	Cough	57	57.00
	COVID-19	1	1.00
	Pain	10	10.00
	Bleeding	10	10.00
Smoking Status	Never smoked	6	6.00
	Ex-smoker	73	73.00
	Currently smoking but less than before	5	5.00
	Currently smoking the same as before	16	16.00

Data Collection Tools

The following tools were used in this study to collect data from the participants: a sociodemographic and medical information form, the Prolonged Grief Disorder Scale, the Cancer Empowerment Scale, and the Self-Compassion Scale.

The Prolonged Grief Disorder Scale, developed by Prigerson et al. (1995) to assess grief symptoms, was initially called the Inventory of Complicated Grief (Prigerson et al., 1995; Prigerson & Jacobs, 2001). With the inclusion of prolonged grief disorder in the proposed ICD-11 classification (Thornicroft & Patel, 2014), the scale was renamed as the Prolonged Grief Disorder Scale. It consists of 12 items scored on a 4-point Likert-type scale (for items 1-4: 1 = never, 5 = several times a day; for items 5-12: 1 = never, 5 = very often). Higher scores indicate more severe grief symptoms. The internal consistency of the scale, as reflected by Cronbach's alpha, was found to be .86 (Jacobsen et al., 2010). In the present study, it was .84.

The Cancer Empowerment Scale, created by van den Berg et al. (2013), measures how empowered cancer patients feel in managing their illness. The Turkish adaptation of the scale, including reliability and validity assessments, was conducted by Karabulutlu et al. (2021). This scale, using a 5-point Likert-type format, is divided into four dimensions: Personal Strength (19 items), Social Support (9 items), Health Services (6 items), and Community Support (6 items). Higher scores from both the overall scale and its subscales indicate stronger feelings of empowerment in dealing with cancer. In this study, the Cronbach alpha value for the total scale was calculated to be .88.

The Self-Compassion Scale consists of 26 items within 6 subscales. Participants are asked to indicate how often they behave in the manner described using a 5-point Likert-type scale ranging from "almost never" (1 point) to "almost always" (5 points). Initially developed by Neff (2003), the scale's Turkish adaptation and validation were performed by Deniz et al. (2008). The Turkish version of the scale has a unidimensional structure and two items with item-total correlations below .30 were excluded, resulting in a 24-item version. The internal consistency was reported as .89 with test-retest reliability of .83. In the present study, the Cronbach alpha value for the total scale score was found to be .82.

Data Analysis

The data collected in this study were analyzed using IBM SPSS Statistics 25.0. Prior to the analysis, the data were checked for outliers and the assumption of normality. No outliers were detected in the dataset. To check the assumption of normality, skewness and kurtosis were examined. The skewness and kurtosis values, along with other descriptive statistical information for the measurement instruments, are presented in Table 2.

Table 2. Descriptive Statistics

Scale	Mean ($\bar{X}$)	Standard Deviation (SD)	Min	Max	Skewness	Kurtosis
Prolonged Grief	27.40	10.18	12.00	60.00	.846	.568
Cancer Empowerment (Total)	166.47	16.93	123.00	200.00	-.236	-.486
Personal Strength	79.14	9.29	53.00	95.00	-.606	.248
Social Support	38.51	4.31	31.00	45.00	.042	-1.34
Health Services	25.62	3.16	16.00	30.00	-.633	.297
Self-Compassion	23.20	3.66	12.00	30.00	-.183	-.066

Byrne (2010) suggests that skewness values ranging from -2 to +2 and kurtosis values between -7 and +7 indicate normal distribution. The skewness and kurtosis values observed in this study fell within those ranges, confirming that the assumption of normality was met. Given the normality assumption, parametric tests were employed, including Pearson correlation analysis and multiple regression analysis.

Before conducting the multiple regression analysis, multicollinearity was assessed using tolerance and variance inflation factor (VIF) values. The VIF values for the independent variables were found to be below 10 and the tolerance values exceeded 0.10, indicating no problems of multicollinearity. Therefore, we concluded that the multiple regression analysis did not have multicollinearity problems (Sipahutar et al., 2021).

Results

Pearson correlation analysis was carried out to explore the relationships between the variables of interest (Table 3). The findings revealed significant negative correlations between prolonged grief and the overall score for cancer empowerment ($r = -.32$, $p < .01$), the dimension of personal strength ($r = -.39$, $p < .01$) and the dimension of self-compassion ($r = -.39$, $p < .01$) in individuals diagnosed with lung cancer. However, no significant correlations were identified between prolonged grief and the dimensions of social support, health, and community support.

Positive and significant correlations were observed between self-compassion and the overall score for cancer empowerment ($r = .38$, $p < .01$), the dimension of personal strength ($r = .43$, $p < .01$), and the dimension of social support ($r = .32$, $p < .01$). No significant correlations were found between self-compassion and health services or community support ($p > .05$). Upon examining the relationships between the total score for cancer empowerment and the dimensions of cancer empowerment, positive and significant correlations were found between the total score and the dimensions of personal strength ($r = .92$, $p < .01$), social support ($r = .85$, $p < .01$), health services ($r = .66$, $p < .01$), and community support ($r = .66$, $p < .01$).

Table 3. *Correlation Analysis Findings*

			1	2	3	4	5	6	7
		r	1						
1.	**Prolonged Grief**	r	-.323**	1					
2.	**Cancer Empowerment (Total)**	r	-.396**	.926**	1				
3.	**Personal Strength**	r	-.192	.851**	.716**	1			
4.	**Social Support**	r	-.125	.664**	.454**	.531**	1		
5.	**Health Services**	r	-.155	.699**	.509**	.480**	.430**	1	
6.	**Community Support**	r	-.399**	.385**	.439**	.323**	.151	.154	1

Note: **p < .01.

Multiple regression analysis was also performed in this study using the enter method to determine the factors that predict empowerment levels in individuals diagnosed with lung cancer (Table 4). The analysis yielded a statistically significant result, indicating that all considered independent variables collectively explained 18% of the variance in cancer empowerment levels ($F(2, 96) = 10.753$, $R^2 = .18$, $p < .001$). Upon reviewing the regression coefficients, it was found that self-compassion ($t = 3.02$, $p = .003$) positively predicted cancer empowerment, while prolonged grief ($t = -2.02$, $p = .046$) was a significant negative predictor. These findings demonstrate that both of those independent variables have an influence on empowerment levels. Based on the standardized beta coefficients, the predictive power of the variables were determined as $\beta = .304$ for self-compassion and $\beta = -.203$ for prolonged grief.

Table 4. *Multiple Regression Analysis Findings*

Variable	B	Standard Error	β	t	p
Self-Compassion	.337	.111	.304	3.022	.003
Prolonged Grief	-.336	.166	-.203	-2.021	.046

Note: Dependent variable: Cancer empowerment level ($F(2, 96) = 10.753$, $R2 = .18$, $p < .001$).

Discussion

This study examined the relationships among prolonged grief, self-compassion, and post-cancer growth in lung cancer patients, highlighting the complex interplay of these psychological factors in the context of cancer-related emotional challenges. The findings provide valuable insights into how self-compassion and prolonged grief impact emotional recovery and empowerment and how these factors align with previous results in the literature.

The first hypothesis (H1) of a negative relationship between self-compassion and prolonged grief was strongly supported by the results. Patients with higher levels of self-compassion exhibited significantly lower

levels of prolonged grief, consistent with previous research highlighting the role of self-compassion in alleviating emotional distress. Previous studies by Schellekens et al. (2017) and Garcia et al. (2021) showed that self-compassion helps to reduce self-blame and emotional suffering, enabling individuals to cope with grief in a healthier way. This is especially important for lung cancer patients, who often experience stigma and guilt, particularly those with a history of smoking (Williamson et al., 2022). By fostering self-kindness and acceptance, self-compassion serves as a protective factor, reducing the emotional toll of grief and enabling patients to process their experiences more effectively.

In contrast, patients with low self-compassion levels were found to experience more intense and prolonged grief, supporting prior research linking low self-compassion to higher levels of emotional exhaustion and negative psychological outcomes (O'Connor, 2019). However, not all studies fully align with this finding. For example, some researchers suggest that the relationship between self-compassion and grief is mediated by additional factors such as social support and coping strategies; thus, other variables may influence how individuals process grief (Golden, 2013). This discrepancy between studies highlights the need for further investigation into how these factors interact in different populations of patients with cancer.

The second hypothesis (H2) of a positive correlation between self-compassion and post-cancer growth was also supported. Patients with higher levels of self-compassion reported higher levels of post-cancer growth, indicating that self-compassion promotes resilience and personal development following a cancer diagnosis. This aligns with Tedeschi and Calhoun's (2004) theory of post-traumatic growth, which posits that individuals may experience significant psychological growth after trauma, especially in the presence of adaptive coping mechanisms like self-compassion. Additionally, Zou et al. (2018) found that patients who practiced self-compassion were more likely to find personal meaning in their cancer experiences, leading to better emotional recovery and psychological growth. However, some studies, such as that by Frambes et al. (2018), suggest that post-cancer growth may be influenced by factors beyond self-compassion, including individual personality traits and external support systems. This highlights the need for a more nuanced understanding of the role that self-compassion plays in facilitating growth, particularly in the context of cancer.

The present study identified a significant negative relationship between prolonged grief and cancer empowerment, highlighting the detrimental psychological effects of unresolved grief. Patients experiencing higher levels of prolonged grief reported lower feelings of empowerment, indicating that unresolved grief weakened their sense of control and engagement in managing their illness. This finding aligns with previous research linking prolonged grief to emotional withdrawal and reduced participation in self-care and treatment decisions (O'Connor, 2019). For lung cancer patients, and particularly those dealing with challenging prognoses or complex treatment plans, the inability to adequately process grief can severely impair their psychological resilience and overall quality of life (Golden, 2013).

On the other hand, self-compassion showed a positive correlation with cancer empowerment, especially regarding personal strength and resilience. Patients with higher self-compassion levels reported feeling more in control of their illness and more capable of managing the challenges of treatment. This aligns with the findings reported by Matzka et al. (2016), who demonstrated that self-compassion fosters a sense of agency and empowerment, allowing patients to actively participate in their own care. This empowerment is also closely linked to post-cancer growth, as patients who feel empowered are more likely to experience personal development and emotional recovery after a cancer diagnosis (Ye et al., 2017).

There are some discrepancies in the literature concerning the link between self-compassion and empowerment. While numerous studies have highlighted the positive role of self-compassion in enhancing empowerment, other research indicates that empowerment may also be influenced by external factors such as the availability of social support or the quality of the healthcare system (Frambes et al., 2018). This suggests that, although self-compassion is an essential component, it may not be the only factor determining empowerment in cancer patients.

The findings of this study have important clinical implications. The strong correlation between self-compassion and positive psychological outcomes suggests that interventions aimed at fostering self-compassion could be highly beneficial in enhancing the emotional well-being of lung cancer patients. Mindfulness-based interventions that encourage self-kindness and emotional regulation may help patients cope better with grief and emotional distress, leading to greater psychological resilience and post-cancer growth. Furthermore, addressing prolonged grief through targeted interventions is essential for preventing the negative psychological impact of unresolved grief. Therapy that focuses on helping patients process grief in a healthy way may help reduce their emotional exhaustion and improve their sense of empowerment. Finally, the positive relationship between self-compassion and cancer empowerment indicates that fostering self-compassion could lead to better treatment adherence, greater emotional engagement, and overall improved quality of life for lung cancer patients.

These findings contribute significantly to the existing body of research by filling several important gaps in the literature. First, while previous studies have demonstrated the general benefits of self-compassion in reducing emotional distress, this study provides specific evidence of how self-compassion alleviates prolonged grief in lung cancer patients, a population uniquely affected by stigma and guilt. Second, this study extends our understanding of how self-compassion fosters post-cancer growth, revealing that patients with higher self-compassion are more likely to experience personal development and emotional recovery after their cancer diagnosis. Additionally, this study is one of the few to date to explore the negative impact of prolonged grief on cancer empowerment, demonstrating that unresolved grief can significantly reduce patients' sense of control and agency in their treatment. Finally, this study highlights the crucial role of self-compassion in promoting cancer empowerment, indicating that fostering self-compassion can empower patients to engage more actively in their care

and enhance their overall psychological resilience. These contributions provide new insights into psychological mechanisms that can improve the quality of life and treatment outcomes of lung cancer patients.

Conclusion

This study investigated the relationships among prolonged grief, self-compassion, and post-cancer growth in lung cancer patients, providing valuable insights into how these psychological factors influence emotional well-being and resilience. The results demonstrated that higher levels of self-compassion were associated with lower levels of prolonged grief and greater cancer empowerment, emphasizing the role of self-compassion in enhancing emotional recovery. Additionally, the positive link between self-compassion and post-cancer growth highlights the importance of self-compassion in fostering personal development and psychological resilience following a cancer diagnosis.

Furthermore, this study revealed a negative relationship between prolonged grief and cancer empowerment, indicating that unresolved grief can diminish patients' sense of control and engagement during treatment processes. Overall, these findings enhance our understanding of the critical roles that self-compassion and prolonged grief play in the emotional and psychological outcomes of lung cancer patients, contributing to a more comprehensive view of their emotional recovery and personal growth.

Recommendations

Based on the findings of this study, several recommendations can be proposed for future research and clinical practice. First, since this study focused on adults diagnosed with lung cancer, future research should expand to include pediatric and adolescent populations to explore the psychological effects of cancer across age groups. Additionally, while this research used a quantitative approach, qualitative methods such as semi-structured interviews could provide deeper insights into the emotional and psychological impacts of cancer. Clinicians are encouraged to implement self-compassion-based psychotherapeutic interventions, as self-compassion was found to enhance personal resilience and empowerment in cancer patients. Tailored interventions that address prolonged grief and foster self-compassion should be developed for cancer patients, as these factors play crucial roles in psychological well-being and treatment engagement.

Declarations

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Conflicts of interest: The authors declare that they do not have any conflict of interest.

Ethics approval: The study was approved by the Research Ethics Committee of Yeditepe University (decision number E.50532705-050.06-400). Informed consent was obtained from all participants included in the study. The research was conducted in accordance with the Declaration of Helsinki.

Consent to participate: All patients provided written informed consent before participating in the research. Written informed consent for publication of the study data was obtained from the participants.

Consent for publication: Not applicable.

Availability of data and materials: The data on which the present results are based are available upon request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Author contributions: ES contributed to the writing, data collection, translation, editing, conceptualization, participation follow-up, review and editing, draft preparation, investigation, and visualization. GF contributed to the analysis, writing—review and editing, data curation, draft preparation, and data collection. SG contributed to the data collection, conceptualization, participation follow-up, writing—review and editing, and draft preparation. All authors read and approved the final version of the manuscript.

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