

Self-Compassion Mediates the Relationship Between Social Support and Quality of Life in Cervical Cancer Patients: A Cross-Sectional Study

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Objective: The aim of this study was to explore the relationship between perceived social support and quality of life in cervical cancer patients, and to explore the mediating role of self-compassion between the two, so as to provide a reference basis for improving the quality of life of patients with cervical cancer.

Methods: Convenience sampling method was used to select cervical cancer patients who attended a tertiary hospital in Sichuan Province from May to October 2024 as study subjects. The Perceived Social Support Scale, Self-Compassion Scale, and Cervical Cancer Quality of Life Measurement Scale were used for data collection. AMOS 26.0 software was used to construct structural equation modeling to analyze the relationship between variables.

Results: The total scores for perceived social support, self-compassion, and quality of life in cervical cancer patients were 42.22±3.65, 98.38±10.95, and 147.73±11.17, respectively. Perceived social support was positively correlated with quality of life ($P<0.01$), and self-compassion was also positively correlated with quality of life ($P<0.01$). Self-compassion partially mediated the relationship between perceived social support and quality of life, accounting for 41.76% of the total effect.

Conclusion: Cervical cancer patients have a moderate level of perceived social support and self-compassion, and a relatively high level of quality of life. Perceived social support can directly enhance or indirectly affect the quality of life of cervical cancer patients through self-compassion. Healthcare professionals can improve patients' levels of self-compassion and quality of life by providing comprehensive social support.

Keywords: cervical cancer, perceived social support, self-compassion, quality of life, mediating effect

Background

Cervical cancer is the most prevalent malignant tumor of the female reproductive system. According to global cancer statistics, approximately 661,000 new cases and 348,000 deaths from cervical cancer were reported in 2022, posing a significant threat to women's health and lives.¹ However, with the widespread implementation of cervical cancer screening and advances in diagnostic and treatment technologies, the 5-year survival rate for cervical cancer patients following surgery has increased to 89–91%.² Therefore, the quality of life in the postoperative period has become a major concern for healthcare professionals. Quality of life is not only a predictor of morbidity and mortality in cancer patients but also a crucial basis for healthcare professionals in providing comprehensive care and supporting clinical decision-making.^{3,4} Perceived social support refers to an individual's emotional experience and satisfaction with being respected, supported, and understood by others in society.⁵ Self-compassion refers to an individual treating oneself with an open and tolerant attitude when experiencing failure, inadequacy, or pain.⁶ For example, a self-compassionate patient with cervical cancer might acknowledge her fears and distress about the treatment and its impacts without self-judgment, and remind herself that many women face similar challenges, thereby consciously treating herself with kindness and understanding rather than with criticism or isolation. Research has shown that the development of self-compassion is closely associated

with positive social support from parents, friends, and other significant individuals,⁷ and that the level of self-compassion is strongly correlated with the quality of life in cancer patients.⁸

Self-compassion, as an internal psychological resource, influences the role of perceived social support in quality of life; therefore, it is likely to be an important mediating variable between perceived social support and quality of life. The stress-coping theory posits that individuals experience a series of physiological, psychological, and behavioral responses when confronted with stressors, and their assessment of these stressors and the coping strategies they adopt can affect their physical and mental health.⁹ Based on the above theories, this study hypothesizes that external coping resources, such as social support, can enhance patients' ability to cope with stressors like cervical cancer, stimulate positive internal psychological resources, such as self-compassion, and encourage them to adopt a positive attitude toward the illness, thereby reducing negative emotions and improving quality of life.¹⁰ However, current research on the relationship among perceived social support, self-compassion, and quality of life is limited to patients with lung cancer.¹¹ It is important to note that the psychosocial experiences of cervical cancer patients are distinct, often involving unique concerns related to fertility, sexuality, and body image, which are generally less prominent in lung cancer. Therefore, findings from lung cancer populations cannot be directly extrapolated to this specific group. Building on this, the pathways of interaction among these three variables also remain unclear in the context of cervical cancer. Consequently, this study aims to explore the relationship between perceived social support, self-compassion, and quality of life in cervical cancer patients, as well as the mediating role of self-compassion, providing a reference for clinical efforts to improve the quality of life in this population.

Methods

Study Design and Participants

This study used convenience sampling to select cervical cancer patients who visited a tertiary hospital in Sichuan Province from May to October 2024 as the research subjects. Inclusion criteria: (1) Age ≥ 18 years old; (2) Diagnosed with primary cervical cancer through pathology and have received clinical treatment; (3) Have complete cognitive ability and can correctly understand the content of the questionnaire; (4) Knows one's own condition, is willing to sign an informed consent form, and voluntarily participates in the study. Data collection occurred after patients had received at least one cycle of their primary treatment (surgery, radiotherapy, or chemotherapy) and were in a clinically stable condition, allowing for a meaningful assessment of their psychosocial adaptation and quality of life. Exclusion criteria: (1) Suffering from mental illness or cognitive impairment; (2) The patient experiences stress events other than illness within six months (such as the death of parents or relatives); (3) Those who are critically ill and unable to complete the questionnaire survey; (4) Merge with other malignant tumors. According to the requirements of structural equation modeling, the sample size was at least 200 cases.¹² 324 patients were finally included in this study.

Measures

Demographic and Disease Data

Demographic and disease-related data were designed by the research team based on a literature review. Demographic information includes age, place of residence, educational level, fertility status, employment status, marital status, cancer stage, time since diagnosis, surgical history, history of radiotherapy, history of chemotherapy, and recurrence status.

Perceived Social Support Scale (PSSS)

This scale was developed by Zimet et al¹³ to assess individuals' perceived level of social support. In this study, a version translated into Chinese by Jiang et al¹⁴ was used, which included three subscales: family support (4 items), friend support (4 items), and other support (4 items), totaling 12 items. Each project adopts a Likert 7-level scoring system, ranging from 1 ("strongly disagree") to 7 ("strongly agree"), with a score range of 12 to 84 on the scale. The overall score can be divided into three levels: low-level score (12–36 points), medium level score (37–60 points), and high-level score (61–84 points). The Cronbach's alpha coefficient of the scale in this study is 0.858.

Self-Compassion Scale (SCS)

This scale was developed by Neff et al¹⁵ to assess an individual's level of self compassion. In this study, a version translated into Chinese by Chen et al was used, which included six subscales: self tolerance (5 items), universal humanity (4 items), mindfulness (4 items), self-criticism (5 items), isolation (4 items), and excessive identification (4 items), totaling 26 items. Each project adopts a Likert 5-point scoring system, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with a score range of 26–130. The higher the score, the higher the individual's level of self compassion. The Cronbach's alpha coefficient of the scale in this study is 0.947.

Functional Assessment Cancer Therapy-Cervix (FACT-Cx)

This scale consists of the Universal Cancer Therapy Functional Evaluation System Scale (FACT-G) and the Cervical Cancer Specific Module (Cx). Developed by Cella et al¹⁶ it is designed to assess the quality of life of cervical cancer patients. In this study, the Chinese version translated by Wan et al¹⁷ was used, comprising five subscales: physical well-being (7 items), social/family well-being (7 items), emotional well-being (6 items), functional well-being (7 items), and the cervical cancer specific module (15 items), for a total of 42 items. Each item was scored on a 5-point Likert scale, ranging from 0 ("not at all") to 4 ("very"), with a total score range of 0–168. Higher scores indicate better quality of life. The Cronbach's alpha coefficient for this study's sample was 0.896, demonstrating strong internal consistency.

Data Collection

Data collection was conducted by two trained investigators. Before the survey, the investigators explained the purpose of the study to eligible participants. After obtaining consent, participants signed the electronic informed consent form by scanning a QR code and proceeded to the formal survey. Upon completion, questionnaires were automatically submitted through Redcap. A total of 329 questionnaires were distributed, and 324 valid questionnaires were collected after excluding 5 incomplete responses, resulting in an effective response rate of 98.48%.

Data Analysis

Data entry was checked by two researchers using Redcap. Statistical analyses were performed using SPSS 26.0 software. The total scores of perceived social support, self-compassion, and quality of life did not follow a normal distribution and were therefore described using the median and interquartile range (25th and 75th percentiles). Spearman correlation analysis was employed to examine the relationships between perceived social support, self-compassion, and quality of life in cervical cancer patients. A structural equation model was constructed using AMOS 26.0, and the bias-corrected bootstrap method with 5000 iterations was applied via the SPSS Process macro (Model 4) to test the mediating effects. The significance level for all analyses was set at $\alpha=0.05$.

Results

Common Method Bias and Multicollinearity Tests

Harman's single-factor test was performed to assess common method bias for all items measuring social support, self-compassion, and quality of life. Principal component analysis identified 20 factors with eigenvalues greater than 1, accounting for a total cumulative variance of 75.22%. The variance explained by the first factor was 5.8%, which is well below the critical threshold of 40%, indicating no significant common method bias in the sample data. The multicollinearity test showed that all VIF values were below 10, confirming the absence of multicollinearity issues among variables.

Participants' Characteristics

Table 1 presents the demographic data and clinical characteristics of 324 participants. The distribution of demographic data is as follows: Age: 25 participants were aged ≤ 40 years, 75 were aged 41–50 years, 165 were aged 51–60 years, and 59 were aged > 60 years; Residence: 120 participants lived in urban areas, 51 in townships, and 153 in rural areas; Education Level: 33 participants were illiterate, 124 completed primary school, 102 completed junior high school, 39 completed senior high school, and 26 attended junior college or above; Fertility Status: 6 participants had no children, 153 had one child, 128 had two children, and 37 had three or more children. Occupational Status: 88 participants were unemployed, 152 were farmers,

Table 1 Demographic and Clinical Characteristics of Participants (N=324)

Items	N	(%)	Items	N	(%)
Age (year)			Marriage status		
≤40	25	7.7	Married	265	81.8
41–50	75	23.1	Unmarried/Divorced/Widow	59	18.2
51–60			Stage of cancer		
>60	59	18.2	I	54	16.7
Residence			II	84	25.9
City	120	37.0	III	153	47.2
Townships	51	15.7	IV	33	10.2
Rural	153	47.2	Time after diagnosis		
Education level			<3 months	137	42.3
Illiteracy	33	10.2	3–6 months	94	29.0
Elementary school	124	38.3	6–12 months	28	8.6
Middle School	102	31.5	>12 months	65	20.1
High School	39	12.0	Surgery		
College and above	26	8.0	Yes	114	35.2
Fertility status			No	210	64.8
No births	6	1.9	Radiotherapy		
1 Birth	153	47.2	Yes	272	84.0
2 Births	128	39.5	No	52	16.0
3 Or more	37	11.4	Chemotherapy		
Work status			Yes	294	90.7
Unemployed	88	27.2	No	30	9.3
Farmer	152	46.9	Recurrence		
Retired	67	20.7	Relapsed	68	21.0
Working	17	5.2	Not relapsed	256	79.0

67 were retired, and 17 were employed; Marital Status: 5 participants were unmarried, 265 were married, 33 were divorced, and 21 were widowed; The clinical characteristics are as follows: Disease Stages: 54 participants were in stage I, 84 in stage II, 153 in stage III, and 33 in stage IV; Time Since Diagnosis: 137 participants were diagnosed < 3 months ago, 94 were diagnosed 3–6 months ago, 28 were diagnosed 6–12 months ago, and 65 were diagnosed > 12 months ago; Surgery: 114 participants underwent surgery, while 210 did not; Radiotherapy Status: 272 participants received radiotherapy, while 52 did not; Chemotherapy Status: 294 participants received chemotherapy, while 30 did not; Recurrence: There were 68 cases of recurrence and 256 cases of non-recurrence. Detailed data can be found in [Table 1](#).



The Score of Perceived Social Support, Self-Compassion and Quality of Life of Cervical Cancer Patients

The mean and standard deviation ($M \pm SD$) of social support, self-compassion and quality of life were 42.22 ± 3.65 , 98.38 ± 10.95 and 147.73 ± 11.17 , respectively. The scores of each dimension are shown in Table 2.

Correlation Analysis of Perceived Social Support, Self-Compassion and Quality of Life in Cervical Cancer Patients

Correlation analysis revealed that perceived social support was positively correlated with self-compassion ($r = 0.137$, $P < 0.05$) and quality of life ($r = 0.183$, $P < 0.01$). Additionally, self-compassion was positively correlated with quality of life ($r = 0.533$, $P < 0.01$) (Table 3).

The Mediating Effect of Self-Compassion on Perceived Social Support and Quality of Life in Patients with Cervical Cancer

The analysis results indicated that self-compassion mediated the relationship between perceived social support and quality of life, and perceived social support directly affected quality of life. Based on these findings, a structural equation model was constructed with perceived social support as the independent variable, quality of life as the dependent variable, and self-compassion as the mediating variable.

Table 2 Total and Dimension Scores of Perceived Social Support, Self-Compassion, and Quality of Life Among Cervical Cancer Patients

Items	Entry	Score ($M \pm SD$)
Total perceived social support score	12	42.22 ± 3.65
Family Support	4	14.58 ± 1.58
Friend Support	4	13.79 ± 1.74
Other Support	4	13.85 ± 1.53
Total self-compassion score	26	98.38 ± 10.95
Mindfulness	4	14.48 ± 2.16
Over-identification	4	14.99 ± 2.34
Universal humanity	4	15.22 ± 2.12
Self-criticism	5	19.24 ± 2.92
Self-tolerance	5	18.98 ± 2.44
Isolation	4	15.47 ± 2.54
Total quality of life score	42	147.73 ± 11.17
Physiological condition	7	24.65 ± 2.81
Social/family situation	7	25.08 ± 2.72
Emotional status	6	21.23 ± 2.31
Functional status	7	24.82 ± 2.71
Specific module	15	51.95 ± 4.76

Abbreviations: m, mean; sd, standard deviation.

Table 3 Correlation Among Perceived Social Support, Self-compassion and Quality of Life of Cervical Cancer Patients

Variable	Perceived Social Support	Self Compassion	Quality of Life
Perceived social support			
Self compassion	0.137*		
Quality of life	0.183**	0.533**	

Notes: ** $P < 0.01$, * $P < 0.05$.

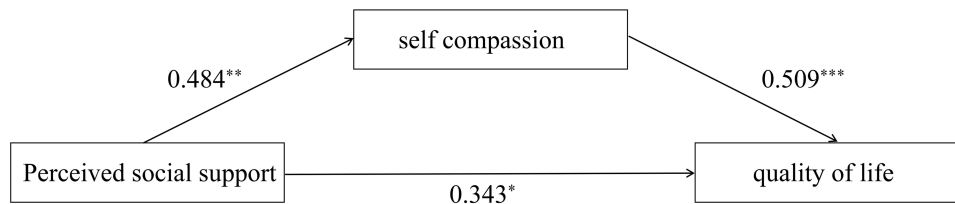


Figure 1 The mediating effect of self-compassion between perceived social support and quality of life of cervical cancer patients (AMOS modified model fit plot).

The initial model fit metrics for AMOS were as follows: $\chi^2/df = 3.373$, RMSEA = 0.086, GFI = 0.903, AGFI = 0.863, CFI = 0.879, IFI = 0.880, and TLI = 0.851. According to the model fit criteria,¹⁸ it was found that some indicators did not meet the required fit and were adjusted. After incorporating correlations among residual variables (e6 and e7, e8 and e9), the model was re-fitted, and the adjusted model demonstrated a good fit (Figure 1), where $\chi^2/df = 2.537$, RMSEA = 0.069, GFI = 0.930, AGFI = 0.898, CFI = 0.924, IFI = 0.925, and TLI = 0.904.

The model validation results are shown in Table 4, indicating that perceived social support has a positive impact on self-compassion ($\beta=0.279$, $P<0.05$). Perceived social support accounted for 6.1% of the variance in self-compassion. Perceived social support has a direct positive impact on quality of life ($\beta=0.163$, $P<0.05$). Self-compassion has a significant positive impact on quality of life ($\beta=0.569$, $P<0.001$). Perceived social support and self-compassion together explained 41.1% of the variance in quality of life.

The mediation effects analysis was performed using Process Model 4 in SPSS software, with 5000 bootstrap samples and a 95% confidence interval. The mediation effects analysis showed a significant total effect of perceived social support on quality of life ($\beta=0.589$, $P<0.001$, 95% CI=0.260–0.918). The direct effect of perceived social support on quality of life remained significant after accounting for the mediating role of self-compassion ($\beta=0.343$, $P<0.05$, 95% CI=0.054–0.631). Self-compassion significantly mediated the relationship between perceived social support and quality of life ($\beta=0.246$, $P<0.001$, 95% CI=0.069–0.445), with the mediating effect accounting for 41.76% of the total effect (Table 5). The mediation model is illustrated in Figure 2.

Table 4 Model Path Inspection

Model Path	β	β	SE	C.R.	P	R ²
The impact of perceived social support on self-compassion	0.279	0.246	0.088	3.157	**	0.061
The impact of perceived social support on quality of life	0.163	0.149	0.078	2.083	*	0.411
The Impact of self-compassion on quality of life	0.569	0.588	0.075	7.558	***	

Notes: *** $P<0.001$, ** $P<0.01$, * $P<0.05$.

Abbreviations: β , unstandardized regression coefficient; β , standardized regression coefficient; SE, Standard Error.

Table 5 Results of Bootstrap Mediation Effect Test

	β	SE	Bias-Corrected 95% CI			Effect Proportion
			Lower	Upper	P	
Indirect effect	0.246	0.096	0.069	0.445	***	41.76
Direct effect	0.343	0.147	0.054	0.631	*	58.23
Total effect	0.589	0.167	0.260	0.918	***	

Notes: *** $P<0.001$, * $P<0.05$.

Abbreviations: β , standardized regression coefficient; se, standard error; CI, confidence interval.

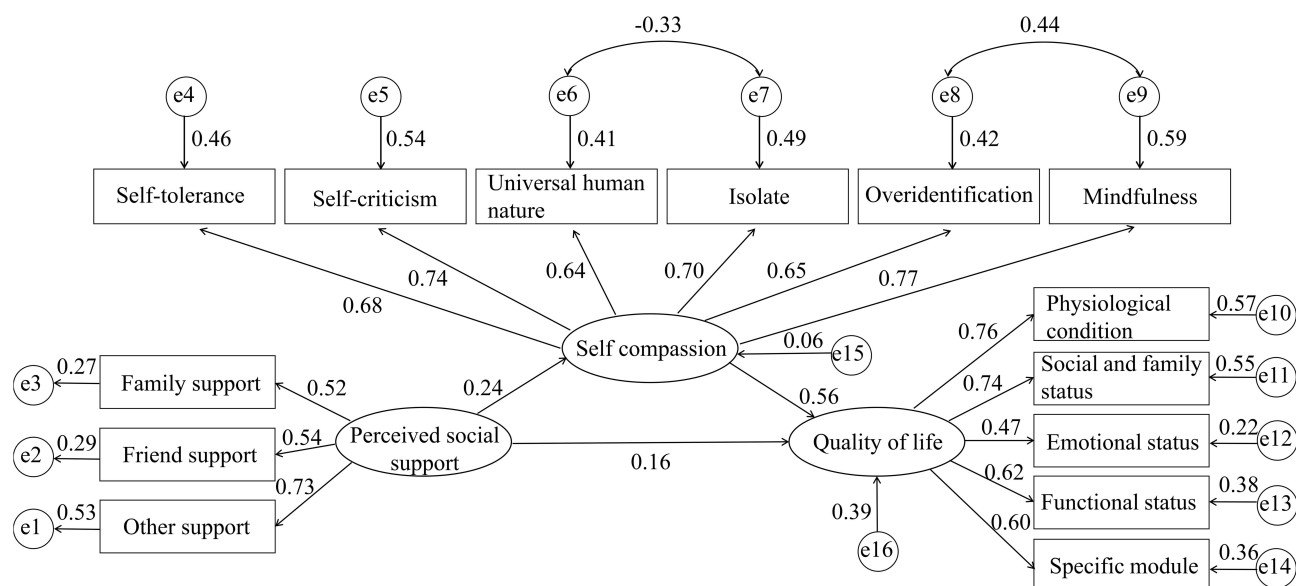


Figure 2 The mediating effect of self-compassion on perceived social support and quality of life. *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.

Discussion

The results of this study showed that the quality of life score of cervical cancer patients was (147.73 ± 11.17) , which was significantly higher than the findings reported by Liang et al¹⁹ (119.80 ± 13.99), indicating that the overall quality of life of the patients was relatively high. In recent years, China has attached great importance to the prevention and treatment of cervical cancer and has actively carried out cervical cancer screening programs, enabling many patients to detect the disease early and receive timely treatment, avoiding further deterioration and reducing the physical and psychological burden.²⁰ Further analysis of the dimensions revealed that the specificity module dimension had the highest score (51.95 ± 4.76), while the emotional status dimension had the lowest score (21.23 ± 2.31). The higher scores on the specificity module may be due to the fact that as cervical cancer treatment protocols continue to be refined, the use of laparoscopic surgery and precision radiotherapy is gradually increasing, which alleviates patients' pain during treatment and thus improves their quality of life.²¹ The lowest score in the emotional status dimension indicates that cervical cancer patients still face greater challenges in terms of emotions. During diagnosis and treatment, patients often experience emotional reactions such as anxiety, depression, and fear, which may be exacerbated by concerns about their health, family responsibilities, and social support.²² In addition, female patients tend to pay more attention to their self-image and social roles, and the physical changes and identity changes brought about by the disease may increase their emotional stress.²³ Therefore, during patients' treatment, healthcare professionals should focus on patients' mental health and provide emotional support and psychological interventions to help patients better cope with the emotional distress caused by the disease, so as to further improve the overall quality of life.

This study found a positive correlation between perceived social support and quality of life, that is, the higher the level of perceived social support among cervical cancer patients, the better their quality of life, which is consistent with previous research results.²⁴ Patients with greater social support are more likely to face the disease with positivity and optimism.²⁵ During the treatment process, social support can also help patients better cope with discomfort and distress by providing information and resources, and thereby enhance their quality of life. Self-compassion is positively correlated with quality of life, consistent with previous research findings. Individuals with higher levels of self-compassion exhibit greater life satisfaction, better self-management abilities, and higher treatment compliance, leading to the adoption of healthier behaviors.

Consistent with the hypothesis, our structural equation model validated that self-compassion plays a significant mediating role in the relationship between perceived social support and quality of life. This finding prompts a deeper exploration into the mechanisms through which self-compassion exerts its beneficial effect. The improvement in QoL facilitated by self-compassion can be attributed to several key psychological mechanisms. Firstly, self-compassion

enhances emotional regulation. It allows patients to approach their disease-related distress with kindness and mindfulness rather than with avoidance or overwhelm, which effectively reduces the intensity of negative emotions like anxiety and fear.²⁶ Secondly, it mitigates maladaptive self-criticism. By quieting the internal critical voice that often accompanies illness, self-compassion frees up psychological resources that can then be directed toward adaptive coping strategies and greater engagement in life.²⁷ Furthermore, it is important to consider the cultural context in which these variables operate. In collectivistic cultures like China, where social harmony and interdependence are emphasized, support from family, in particular, might play a uniquely salient role in fostering a patient's sense of self-worth and compassion.²⁸ Conversely, the concept of self-compassion, which involves turning supportive attention inward, might be experienced differently than in individualistic cultures that prioritize independence.²⁹ Future research should explore these cultural nuances to ensure that psychosocial interventions are culturally tailored. Therefore, based on these mechanisms and considerations, healthcare professionals can mobilize multifaceted support to enhance patients' self-compassion. For instance, family members can be guided to provide a non-judgmental environment that reduces self-criticism, while interventions can be designed to teach patients the skills of self-compassionate emotional regulation.

Clinical Implications

Although studies have shown that social support has a significant positive impact on patients' quality of life, the mediating role of self-compassion between the two is not clear. This study is the first to reveal the relationship between perceived social support, self-compassion, and quality of life in cervical cancer patients. It was found that both perceived social support and self-compassion can significantly improve patients' quality of life, and self-compassion plays a partial mediating role in this process. This study provides important guidance for the development of psychological support strategies and comprehensive nursing measures in clinical practice, suggesting that medical staff can enhance cervical cancer patients' quality of life by enhancing patients' perception of social support and cultivating self-compassion.

Study Limitations

Firstly, as a cross-sectional study, this study only explored the current status and mechanism of perceived social support, self-compassion, and quality of life in cervical cancer patients, and failed to reveal the causal relationship between variables. Secondly, while we collected data on treatment types, our sample size was not sufficient to conduct robust comparisons of quality of life between different treatment modalities (eg, surgery vs chemoradiation). Given that treatment regimens can significantly impact patients' physical and psychological well-being in distinct ways, future longitudinal studies with larger samples should investigate the trajectories of self-compassion and QoL across different treatment pathways. Furthermore, due to the limited sample source, this study only included patients from a tertiary hospital in Sichuan Province, which may affect the generalizability of the findings. Therefore, future research should expand the sample size and diversity, and conduct longitudinal studies to more comprehensively verify the mechanisms of action between variables, providing a scientific basis for further improving the quality of life of cervical cancer patients.

Conclusions

This study verified for the first time the mediating effect of self-compassion in comprehending the relationship between social support and quality of life, suggesting that healthcare professionals should actively mobilize the mediating mechanism of patients' self-compassion and provide adequate social support, thus effectively improving patients' quality of life.

Ethics Statement

The study was approved by the Ethics Committee of Sichuan Cancer Hospital (SCCIC-02-2024-090), and informed consent was obtained from all participants. The study was conducted in accordance with the Declaration of Helsinki.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically

reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

All authors of this study do not have any conflicts of interest.

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