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Original Article

Burden and Quality of Life in Prostate Cancer Caregivers

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Abstract

Objective: Caregivers of patients with metastatic prostate cancer often face physical and emotional strain. Guided by the Informal Caregiving Integrative Model (ICIM), this study aimed to identify factors predicting reported caregiving burden and its impact on quality of life (QoL) among Thai caregivers.

Material and Methods: This cross-sectional correlational study involved 116 caregivers at a Thai university hospital. Data were collected via interviewer-administered questionnaires, including the Zarit Burden Interview and the WHOQOL-BREF. Analysis included descriptive statistics, Spearman correlation, and logistic regression.

Results: Caregivers reported a low average burden score (median = 3.00, IQR = 13.00) and a high level of QoL (mean = 99.35, SD = 9.13). Binary logistic regression analysis revealed that caregiver health status, patient symptom intensity, and illness duration were significant determinants of caregiving burden ($p < 0.05$), with a high predictive accuracy of 88.8%. The model also identified caregiver education level, patient illness duration, and reported caregiving burden as significant predictors of QoL, achieving a predictive accuracy of 81.9%.

Conclusion: The findings suggest that caregiver characteristics and clinical factors influence reported burden and QoL. In the Thai context, family support and cultural values likely mitigate perceived strain. Careful interpretation of these reported scores is recommended due to the potential social desirability bias. Healthcare providers should prioritize caregiver health and provide disease-specific guidance to sustain high QoL for both caregivers and patients.

Keywords: Caregiver burden, quality of life, metastatic prostate cancer, Family caregivers, determinants, nursing care

Introduction

Prostate cancer is the second most common cancer among men and the fifth leading cause of death worldwide.[1-2] In Thailand, it ranks as the fourth most common cancer in men, with a steadily increasing annual incidence.[3] Due to the often asymptomatic nature of the disease, many patients are diagnosed only after it has metastasized.[4] In clinical practice, metastatic prostate cancer encompasses a spectrum ranging from castration-sensitive (mCSPC) or castration-resistant

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(mCRPC) stages, each associated with varying degrees of symptom burden and prognosis. Treatment typically involves androgen deprivation therapy (ADT) or bilateral orchiectomy. However, such therapies can lead to significant side effects, including hot flushes, agitation, fatigue, depression, cardiovascular complications, and increased risk of bone fractures from metastasis.[5-6]

The progressive decline in physical function and increased dependency of metastatic cancer patients necessitate intensive multidimensional care from caregivers, who often provide an average of 35.7 hours of unpaid care per week.[7] While the clinical spectrum of metastatic disease is heterogeneous, the associated symptom burden—regardless of the specific castration-response status—potentially intensifies the physical and emotional strain on informal caregivers. Consequently, caregivers often perceive that their physical, emotional, social, and spiritual states are profoundly affected by the caregiving role. This perception, known as caregiving burden[8], impacts their bodies, minds, social relationships, and environment.[9-10] Such a burden interferes with their daily roles and health, ultimately leading to a significant reduction in caregivers' long-term quality of life (QoL).[11-12]

To systematically understand these dynamics, this study employed the Informal Caregiving Integrative Model (ICIM).[13] This framework identifies three primary determinants of caregiving outcomes: 1) caregiver's characteristics, including sociodemographic, psychological, and physical health factors; 2) caregiving setting, such as symptom intensity and caregiving duration; and 3) social environment, including professional and family support.

While the ICIM has been applied in various contexts, there is limited evidence in non-industrialized nations like Thailand regarding caregivers of metastatic cancer patients. Therefore, this study examined the caregiving burden and quality of life in this population using the ICIM framework. The findings will provide essential information to healthcare providers to develop targeted interventions, reduce caregiver burden, and maintain a high QoL

.

Material and Methods

Study Design and Participants:

This study employed a cross-sectional correlational predictive design to investigate caregiving burden and QoL. Using purposive sampling, we recruited 116 primary family

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caregivers of patients diagnosed with metastatic prostate cancer as a collective group to capture a broad perspective of caregiving experiences in this advanced stage. This study was conducted at a Thai university hospital between October and December 2022. Eligible participants met the following inclusion criteria: (1) aged 18 years or older, (2) identified as the primary family caregiver responsible for home care, and (3) proficient in the Thai language. Participation was entirely voluntary.

Ethical Considerations:

The study protocol was approved by the Research Ethics Committee of the Faculty of Nursing, Chiang Mai University (Approval No. 128/2022). Prior to data collection, the researchers explained the study's objectives, procedures, and the right to withdraw at any time without affecting the quality of care provided to their family members. All participants provided informed consent, and strict confidentiality was maintained for all the collected data.

Instruments:

Data were collected using three main instruments:

1. Demographic Questionnaire: Developed based on the Informal Caregiving Integrative Model (ICIM)[13], this tool captured sociodemographic and clinical data for both caregivers and patients.

2. Zarit Burden Interview (Thai Version): This scale assesses the perceived burden of caregiving. The Thai version has previously demonstrated high reliability (Cronbach's alpha = 0.92).[14] In the present study, the scale yielded a Cronbach's alpha of 0.88.

3. WHOQOL-BREF-Thai: This 26-item instrument measures quality of life across four domains. It has established validity (CVI = 0.65) and reliability (Cronbach's alpha = 0.92).[15] The internal consistency for this study was 0.91.

***Data Collection Procedure*:**

Data collection was conducted by a trained clinical research nurse through face-to-face interviews. Caregiver demographics and psychosocial measures (Zarit Burden and WHOQOL-

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BREF) were obtained through verbal interviews where the research nurse read questions aloud to ensure clarity. The research nurse conducted interviews in civilian clothing to diminish the perceived dynamic and clinical hierarchy. All sessions took place in a private consultation room to ensure confidentiality and provide a safe space for participants to share their experiences. Patients' clinical data were retrieved from official medical records to ensure accuracy. All responses were immediately recorded and verified for completeness.

***Data Analysis*:**

Statistical analysis was performed using descriptive statistics for demographic profiles. Relationships between determinants, caregiving burden, and QoL were analyzed using Spearman correlation coefficients. To identify significant predictors, binary logistic regression was employed for caregiving burden and caregivers' QoL. Statistical significance was set at $p < 0.05$.

Results

Sample Characteristics:

The study included 116 caregivers of patients with metastatic prostate cancer. The patients had a mean age of 74.2 years (SD = 8.05), with 47.4% having completed primary education. The average duration since cancer diagnosis was 4.6 years (SD = 3.47). Regarding clinical symptoms, 92.2% of patients maintained functional independence in daily activities, as assessed by the Barthel Index. Despite this high functional autonomy, significant clinical symptoms were reported, most notably pain (62.3%) and urinary issues, such as frequency or incontinence (29.9%).

The caregiver cohort was predominantly female (84.5%), with a mean age of 56.6 years (SD = 13.67). Over half were wives (54.3%) or children (42.2%) of the patients, and 56.0% held a college degree or higher. While 50.0% of caregivers reported no chronic diseases, those with existing conditions generally described them as manageable (49.1%). On average, caregiving occupied 5.91 hours per day (SD = 5.23), and 50.9% had family members to share caregiving responsibilities. Notably, 77.6% of caregivers received consistent guidance from healthcare professionals during hospital visits, and 79.3% expressed high satisfaction with the support received.

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Caregiving Burden and Quality of Life:

The majority of caregivers (87.1%) reported a low level of burden, while 10.3% and 2.6% perceived moderate and high levels of burden, respectively (Median = 3.00, IQR = 13.00). Regarding Quality of Life (QoL), 71.6% of participants rated their QoL as high, and 28.4% reported moderate QoL (Mean = 99.35, SD = 9.13) (Table 1).

Correlation analysis revealed that caregiver health status ($r = 0.235$, $p < 0.05$) and patient symptom intensity ($r = 0.357$, $p < 0.001$) were positively associated with caregiving burden. Conversely, caregiving burden reported a significant negative correlation with caregivers' QoL ($r = -0.333$, $p < 0.001$) (Table 2).

***Predictors of Caregiving Burden and Quality of Life*:**

Binary logistic regression analysis demonstrated that the model correctly predicted caregiving burden at a rate of 88.8%. Significant predictors of increased caregiving burden included *caregiver's health status* ($\beta = 2.271$, $p = 0.009$), *patient's symptom intensity* ($\beta = 1.942$, $p = 0.035$), and *illness duration* ($\beta = 0.238$, $p = 0.011$) (Table 3).

For Quality of Life, binary logistic regression identified *caregiver's education level* ($\beta = -1.893$, $p = 0.013$), *illness duration* ($\beta = -0.195$, $p = 0.035$), and *caregiving burden* ($\beta = -0.136$, $p < 0.001$) as significant predictive factors. The model achieved an overall predictive accuracy of 81.9% (Table 4).

Discussion

In this study, the majority of caregivers for patients with metastatic prostate cancer reported a low level of caregiving burden. This finding aligns with the Informal Caregiving Integrative Model (ICIM), which suggests that caregiver outcomes are determined by a complex interplay of caregiver characteristics, caregiving settings, and the social environment. [13] Our analysis identified caregiver health status and patient symptom intensity as primary positive correlates of burden, while illness duration also emerged as a significant predictor.

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The low level of reported burden can be attributed to the Thai cultural context. In Thai society, family members, particularly spouses and children, view caregiving as a moral duty and an expression of gratitude (*Katanyu*). Husbands and fathers are traditionally held in high regard as heads of households; thus, providing care during their illness is performed with sincerity and love, rather than being viewed solely as a stressful obligation.[16] Furthermore, the presence of other family members to assist in caregiving likely acted as a protective buffer, preventing caregivers from feeling physically, emotionally, or spiritually overwhelmed.[17] The observed low burden may be explained by the typical Thai family structure, which often involves multiple family members sharing caregiving tasks. Although this study did not quantify the number of secondary caregivers, the collective caregiving model typical of Thai households likely serves as a significant buffer against caregiver burden.

In addition, the generally favorable health status of caregivers in this study played a crucial role in mitigating perceived burden. This finding stands in contrast to previous Thai research, which has indicated that caregivers with poor health or chronic diseases often reported significantly higher stress and perceived a substantial burden when caring for cancer patients.[18] Thus, our results reinforce the notion that maintaining the caregiver's physical well-being is a fundamental determinant of their ability to sustain long-term care without a sense of overwhelming burden.

Within the caregiving setting, the relatively high functional independence of the patients in this study contributed to the low burden. Despite being in a metastatic stage, many patients reported low symptom intensity, as prostate cancer often progresses more slowly compared to other malignancies.[19] Consequently, caregivers spent an average of only 5.91 hours per day on care tasks, preventing the social isolation and exhaustion typically reported in studies where caregiving is required 24 hours a day.[20] Additionally, the robust *social environment* played a crucial role; caregivers expressed high satisfaction with the professional support and disease-specific guidance received from healthcare providers, which empowered them to manage changing symptoms effectively.[21]

While our clinical data primarily highlighted pain and urinary issues as prevalent symptoms, it is important to consider the broader impact of metastatic prostate cancer care.

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Literature suggests that side effects such as agitation—even if not the primary focus of this study—could potentially influence caregiver strain, particularly when symptoms are unpredictable. However, the high rate of functional independence (92.2%) observed in this cohort was a critical factor that likely served as a protective buffer, thereby keeping the overall caregiver burden at a manageable level compared to studies involving more debilitated patient populations.

Regarding Quality of Life (QoL), the majority of caregivers reported a high QoL, which was significantly predicted by their education level, illness duration, and perceived burden. Higher education likely equipped caregivers with better communication and problem-solving skills, allowing them to adapt more effectively to stressful situations and secure necessary resources.[22-25]

Interestingly, while long-term caregiving can lead to accumulated stress,[26] our findings offer a different perspective. Consistent with a study by Valluri,[27] we found that caregivers of patients with a longer duration of illness often reported better QoL than those in the early stage of diagnosis. It is hypothesized that this positive correlation may reflect a process of experiential learning and gradual adaptation to the caregiving role over time. Through prolonged exposure to the caregiving context, caregivers might develop more effective coping strategies and a better grasp of symptom management. However, because this study did not objectively measure health literacy or illness perception, the role of disease-specific understanding in enhancing QoL remains a hypothesis that requires further investigation.

In the Thai context, when caregiving leads to clinical improvements in the patient, caregivers feel a sense of empowerment and are viewed as valuable members of society. Furthermore, the involvement of other family members in the caregiving process provided caregivers with the necessary personal time to work or socialize, ensuring that their physical, mental, social, and environmental health were not significantly compromised. Nonetheless, the significant negative relationship found between caregiving burden and QoL reinforces the findings of previous integrative reviews[28] and other studies[11-12], confirming that a high perceived burden remains a primary threat to caregiver well-being.

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Limitations and Recommendations

Several limitations should be noted. First, the single-center design and purposive sampling at a university hospital may limit the generalizability of these findings to other Thai contexts with different resource levels because of healthcare system variability and burden spectrum.

Importantly, the omission of socioeconomic data and healthcare coverage schemes is a major limitation. Given that 56% of caregivers were college-educated and patients showed high functional independence (92.2%), this cohort likely represents a higher socioeconomic stratum, which may account for the unexpectedly low burden scores. We also emphasized that our findings may not be generalizable to those in lower socioeconomic strata.

Furthermore, the use of interviewer-administered questionnaires in a clinical setting may have introduced social desirability bias, particularly regarding cultural norms of 'saving face'. Additionally, the study did not quantify the presence of secondary caregivers or use validated tools for illness perception; thus, these factors remain hypothesized influences. Despite these constraints, this study provides a critical baseline for understanding caregiver well-being in advanced prostate cancer within a non-Western context.

Nevertheless, these findings underscore the importance of health information support and the encouragement of family involvement. Healthcare providers should prioritize promoting caregiver health and providing clear guidelines for disease progression to maintain a high quality of life for both caregivers and patients.

Conclusion

Caregivers of patients with metastatic prostate cancer in this Thai cohort reported a low caregiving burden and maintained a high quality of life. The findings suggest that caregiving outcomes are influenced by a complex interplay of caregiver health, patient symptom intensity, and the duration of illness. The preserved functional independence of patients and the high educational background of caregivers likely contributed to these positive outcomes. While situated within the Thai context, these results provide a crucial global perspective on how socio-cultural values—such as filial piety and collective family support—can serve as buffers against caregiving strain. These insights suggest that international frameworks, like the ICIM, should incorporate such cultural nuances alongside clinical and socioeconomic factors, highlighting that the meaning

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attributed to the caregiving role is as significant as physical stressors in determining caregiver well-being.

Clinical Implications and Recommendations

1. Culturally Sensitive Care: Healthcare providers should transition toward a "Family-Centered Care Model" that recognizes and integrates the family unit as a primary resource. In family-oriented societies globally, nursing interventions should leverage existing social support to sustain the primary caregiver's resilience.
2. Proactive Health Monitoring: Since caregiver health is a primary predictor of burden, nurses must prioritize the regular assessment of the caregiver's own physical and mental status. Targeted support is essential for caregivers with pre-existing chronic conditions to prevent burnout.
3. Symptom Management Empowerment: As patient symptom intensity directly impacts burden, providing caregivers with disease-specific education (e.g., pain and urinary management) is a universal strategy to enhance their confidence and perceived control over the caregiving situation.
4. Strategic Resource Allocation: The high predictive accuracy of the models used in this study (over 80%) suggests that similar variables can be used to develop screening tools in other non-industrialized or resource-limited settings. This allows healthcare teams to identify and support high-risk caregivers early in the disease trajectory.

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Conflict of interest

The authors declare no conflicts of interest regarding this study.

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References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71(3):209-249.
3. National Cancer Institute, Ministry of Public Health. Hospital-based cancer registry 2017. Bangkok: Ministry of Public Health; 2017.
4. Lojanapiwat B. Urologic cancer in Thailand. Jpn J Clin Oncol. 2015;45(11):1007-1015.
5. European Association of Urology. EAU guidelines on prostate cancer [Internet]. Arnhem: European Association of Urology; 2021 [cited 2021 Apr 9]. Available from: https://uroweb.org/guidelines/archive/prostate-cancer
6. National Cancer Institute, Ministry of Public Health. Guidelines for screening, diagnosis, and treatment of prostate cancer. Bangkok: Kosit Printing; 2017.
7. Schwartz K, Beebe-Dimmer J, Hastert TA, Ruterbusch JJ, Manty J, Harper F, et al. Caregiving burden among informal caregivers of African Americans. J Cancer Surviv. 2021;15(4):630-640.
8. Bevans MF, Sternberg EM. Caregiving burden, stress, and health effects among family caregivers of adult cancer patients. JAMA. 2012;307(4):398-403.
9. Ayumi T, Sena Y, Harue A. Caregiver burden of cancer patients related to cognitive decline at end of life. Cancer Care Res Online. 2022;2(1):e105.
10. Adelman RD, Tmanova LL, Delgado D, Dion S, Lachs MS. Caregiver burden: a clinical review. JAMA. 2014;311(10):1052-1060.
11. Shin JY, Lim JW, Shim D, Park SM, Yang HK, Kim SY, et al. Underestimated caregiver burden by cancer patients and its association with quality of life, depression, and anxiety among caregivers. Eur J Cancer Care (Engl). 2018;27(2):e12814.
12. Langenberg SMCH, van Herpen CML, van Opstal CCM, van der Graaf WTA, Prins JB, van Laarhoven HWM. Caregivers' burden and fatigue during and after patients' treatment

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with concomitant chemoradiotherapy for locally advanced head and neck cancer: a prospective observational pilot study. Support Care Cancer. 2019;27(11):4145-4154.

13. Gerain P, Zech E. Informal caregiver burnout? Development of a theoretical framework to understand the impact of caregiving. Front Psychol. 2019;10:1748.
14. Toonsiri C, Sunsern R, Lawang W. Development of the Burden Interview for caregivers of patients with chronic illness. J Nurs Sci Educ. 2011;34(1):62-75.
15. Mahattanirunkul S, Tantipiwattanasakul W, Phumpaisanchai W. World Health Organization quality of life indicators: Thai version [Internet]. Nonthaburi: Department of Mental Health; 2002 [cited 2020 May 5]. Available from: https://www.dmh.go.th/test/download/files/whoqol
16. Lunpilar C. Factors related to burden of caregivers for the elderly bed bound in Muang District, Mahasarakham. Mahasarakham Hosp J. 2021;18(2):33-43.
17. Fellia T, Sarafis P, Bouletis A, Tzenetidis V, Papathanasiou I, Apostolidi TP, et al. Correlation of cancer caregiver's burden, stress, and their quality of life. Adv Exp Med Biol. 2023;1425:267-273.
18. Suksathapornlert P, Tanthapong U, Srijongjai S. Caregiving burden factors affecting quality of life among cancer end-stage patients in Nakhonpathom Province. Christian University of Thailand Journal. 2014;20(3):493-509.
19. Noppakun L, Indratula R, Vuttanon N. Quality of life among persons with prostate cancer. Srinagarind Med J. 2020;35(3):320-325.
20. Moghaddam ZK, Rostami M, Zeraatchi A, Bytamar JM, Saed O, Zenozian S. Caregiving burden, depression, and anxiety among family caregivers of patients with cancer: an investigation of patient and caregiver factors. Front Psychol. 2023;14:1059605.
21. Kahriman F, Zaybak A. Caregiver burden and perceived social support among caregivers of patients with cancer. Asian Pac J Cancer Prev. 2015;16(8):3313-3317.
22. Geng HM, Chuang DM, Yang F, Yang Y, Liu WM, Liu LH, et al. Prevalence and determinants of depression in caregivers of cancer patients: a systematic review and meta-analysis. Medicine (Baltimore). 2018;97(39):e11863.
23. Al Ali NM, Eid A, Aljada N. Determinants of quality of life in family caregivers of patients with leukemia: a cross-sectional study. SAGE Open. 2023;13(4):21582440231205350.

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24. Afzal MI, Lijuang W. Determinants of caregivers' burden of cancer patients: a systematic review. In: Sarginson WP, Ashar MN, Maureen I, editors. Reimagining Innovation in Education and Social Science. London: Routledge; 2023. p. 305-314.
25. Songsangchan C, Thanasilp S, Pudtong N. Factors predicting quality of life in family caregivers of terminal cancer patients. RTN Med J. 2017;44(2):111-130.
26. Rooeintan M, Haghighi S, Ahmadi M. Caregiver burden and quality of life among caregivers of cancer patients in Ahvaz, 2021-2022: a cross-sectional study. Jundishapur J Chronic Dis Care. 2023;12(4):e138098.
27. Valluri V. Assessment of quality of life of caregivers of persons living with cancers: a tertiary health center-based cross-sectional study. Qeios [Internet]. 2023 [cited 2023 Dec 1]. Available from: https://doi.org/10.32388/4AMYHD.2
28. Akter J, Konlan KD, Nesa M. Factors influencing cancer patients' caregivers' burden and quality of life: an integrative review. Heliyon. 2023;9(11):e21243.

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Table 1. Caregivers' perspectives on their burden and quality of life while caring for metastatic prostate cancer patients (n = 116)

Caregiving burden and quality of life score	Number (%)
Caregiving burden (median = 3.00, IQR = 13.00)	
Low (scores of 0-20)	101 (87.1)
Moderate (scores of 21-40)	12 (10.3)
High (scores of 41-60)	3 (2.6)
Quality of life (mean = 99.35, SD = 9.13)	
Low (scores of 26-60)	0
Moderate (scores of 61-95)	33 (28.4)
High (scores of 96-130)	83 (71.6)

Table 2. Correlation coefficients of the determinants of caregiving burden and quality of life among the caregivers (n = 116)

Determinants	Caregiving burden	Quality of life
	r (p)	r (p)
Caregiver characteristics		
Gender	0.101 (0.547)[1]	0.006 (0.945)[1]
Age	-0.137 (0.141)[2]	-0.075 (0.427)[2]
Education	0.116 (0.455)[1]	0.178 (0.052)[1]
Health status	0.235 (0.033)[1]	0.019 (0.837)[1]
Caregiving setting		
Caregiving duration	0.129 (0.167)[2]	0.078 (0.402)[2]
Symptoms intensity	0.357 (<0.001)[1]	0.102 (0.268)[1]
Illness duration	0.180 (0.053)[2]	-0.134 (0.152)[2]
Social environment		
Professional support	0.062 (0.802)[1]	0.064 (0.491)[1]
Family support	0.118 (0.440)[1]	0.046 (0.617)[1]

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Determinants	Caregiving burden	Quality of life
	r (p)	r (p)
Caregiving burden		-0.333 (<0.001)[2]

[1]=contingency coefficient, [2]= Spearman's correlation coefficient, $p < 0.05$

Table 3. Binary logistic regression model for variables predicting caregiving burden (n = 116)

Variables	β	SE β	Wald's χ^2	df	OR	95%CI	p-value*
Caregiving characteristics							
Gender	-0.748	0.977	0.586	1	0.473	0.070-3.214	.444
Age	0.022	0.026	0.690	1	1.022	0.971-1.076	.406
Education	-0.350	1.061	0.109	1	0.705	0.088-5.635	.742
Health status	2.271	0.864	6.919	1	9.692	1.784-52.654	.009
Caregiving setting							
Caregiving duration	0.092	0.061	2.288	1	1.097	0.973-1.236	.130
Symptoms intensity	1.942	0.922	4.434	1	6.973	1.144-42.505	.035
Illness duration	0.238	0.094	6.437	1	1.269	1.056-1.525	.011
Social environment							
Professional support	-0.268	0.846	0.101	1	0.765	0.146-4.011	.751
Family support	-0.797	0.751	1.126	1	0.451	0.103-1.964	.289

OR=odds ratio, CI=confidence interval

*p-value<0.05

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Table 4. Model fit and predictive performance

Test	Statistic	Value
Model Fit Statistics	Hosmer and Lemeshow Test ($\chi 2$)	9.005 (df=8, p = 0.342)
	-2 Log Likelihood	67.725
	Nagelkerke R Square	0.317
Prediction Accuracy	Overall Percentage Correct	88.80%

$p > 0.05$

Table 5. Binary logistic regression model for variables predicting caregivers' quality of life (n = 116)

Variables	β	SE β	Wald's χ^2	df	OR	95%CI	p-value*
Caregiving characteristics							
Gender	-0.543	0.717	0.574	1	0.581	0.142-2.369	0.449
Age	0.019	0.026	0.498	1	1.019	0.967-1.073	0.480
Education	-1.893	0.759	6.228	1	0.151	0.034-0.666	0.013
Health status	0.006	0.577	0.000	1	1.006	0.325-3.115	0.992
Caregiving setting							
Caregiving duration	0.047	0.053	0.772	1	1.048	0.944-1.163	0.380
Symptoms intensity	-1.030	0.849	1.474	1	0.357	0.068-1.883	0.225
Illness duration	-0.195	0.092	4.460	1	0.823	0.687-0.986	0.035
Social environment							
Professional support	0.072	0.637	0.013	1	1.075	0.308-3.748	0.910
Family support	0.158	0.493	0.102	1	1.171	0.445-3.080	0.749

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Variables	β	SE β	Wald's χ^2	df	OR	95%CI	p-value*
Caregiving burden	-0.136	0.035	14.881	1	0.873	0.815-0.935	<.001

OR=odds ratio, CI=confidence interval

*p-value<0.05

Table 6. Model fit and predictive performance

Test	Statistic	Value
Model Fit Statistics	Hosmer and Lemeshow Test (χ2)	8.373 (df=8, p = 0.398)
	-2 Log Likelihood	94.445
	Nagelkerke R Square	0.454
Prediction Accuracy	Overall Percentage Correct	81.90%

p > 0.05

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