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Research Article

Determinants of Unmet Supportive Care Needs Among Adults Living With Cancer: A Cross-Sectional Study in Southwest Ethiopia

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Background: Cancer patients often experience various unmet supportive care needs throughout their treatment journey. Identifying these needs is essential to enhancing care and quality of life. This study aimed to assess the unmet supportive care needs and associated factors among adult cancer patients at Jimma Medical Center, Oromia, Southwest Ethiopia, in 2024.
Methods: A cross-sectional study of 261 adult cancer patients was conducted at Jimma Medical Center between December 1 and January 1, 2024. Data were collected through face-to-face interviews using a validated supportive care needs survey. Descriptive statistics and logistic regression analyses identified factors associated with unmet supportive care needs, with results reported using crude and adjusted odds ratios at a 95% confidence interval. A p value of < 0.05 was considered statistically significant.
Results: Of the 261 cancer patients surveyed, 98.5% responded, with a mean age of 44 ± 13.14 years. Psychological needs were the most unmet need (87.1%), followed by physical (79.1%) and sexual needs (47.8%). Factors significantly associated with unmet needs included younger age, low education, lack of health insurance, financial difficulties, treatment side effects, and poor quality of life ($p < 0.05$).
Conclusion and Recommendation: The study revealed high levels of unmet supportive care needs among cancer patients, particularly in the psychological domain. Individualized, patient-centered care should be prioritized, especially for younger, less educated, uninsured patients, and those facing financial issues, treatment side effects, or poor quality of life.

Keywords: cancer; Ethiopia; patient; quality of life; unmet supportive care needs

1. Introduction

The World Health Organization defines cancer as a large group of diseases with uncontrolled proliferation of abnormal cells in the body that are capable of metastasizing to neighboring tissues [1]. With advances in the scientific knowledge of cancer origin, its incidence and impact are increasing globally [2, 3]. Current global cancer statistics show that cancer is the second most common cause of mortality and a major health risk, with significantly reduced life expectancy for patients in every country [4]. The global burden of cancer statistics is estimated at 19.3 million new cancer cases and almost 10.0 million cancer deaths in 2020. From the whole cancer mortality data, 20.3% occurred in Europe, 14.4% in America, 57.3% in Asia, and 7.3% in Africa; 520,158 cancer deaths occurred in sub-Saharan Africa; and 51,865 people died in Ethiopia [2, 4, 5].

The Multinational Association of Supportive Care defines supportive care as the prevention and management of adverse effects of cancer and its treatment. It is a broad term covering psychological, physical and daily living, health system and information, patient care and supportive

domain, and sexual need domains that involve multiple disciplines to meet the patient's needs [6].

A review by several authors suggested that due to the progressive nature of the disease, the demand for supportive care is increasing, and deficiencies in every area of patient need represent unmet needs that develop at any stage and negatively influence the outcome of cancer treatments [7–9]. As the burden of cancer increases, the need for supportive care predominates, and unmet needs change over time and become the main predictor of health-related quality of life [10, 11].

The Cancer Treatment Centers of America and the Federal Ministry of Health of Ethiopia developed guidelines for cancer control to address all needs of patients throughout treatment to improve their quality of life. Despite this, there are an increasing number of morbidities, distress, and cancer-related deaths [12, 13]. Global cancer reports indicate that the prevalence of cancer has been increasing, leading to a high number of unmet needs for care related to the disease problems, which increases its burden, especially in terms of morbidity [14, 15].

Recent global evidence highlights persistent unmet supportive care needs among people living with cancer, particularly in low- and middle-income countries. It is reported that patients with advanced cancer and their caregivers across LMICs experience major psychosocial and informational care gaps due to limited healthcare infrastructure [16]. These unmet needs are compounded by low resource allocation and weak support systems, emphasizing the importance of context-specific strategies to strengthen supportive care and improve the quality of life of cancer patients in resource-constrained settings, such as Ethiopia [16–18].

Providing supportive care to cancer patients is a complex and multifaceted issue that requires coordinated effort from healthcare providers, caregivers, and patients themselves. It is difficult to meet all the needs of every cancer patient; some level of unmet needs may still exist, even with interventions [11]. Unmet supportive care needs have several negative consequences for physical, psychological, and social well-being, including increased healthcare costs and financial burden; decreased quality of life; social isolation; a high risk of mortality; and an increased burden on families, friends, and caregivers [19–22].

In low- and middle-income countries and sub-Saharan Africa, there is inequality in access to care, and over half of them lack a single radiation therapy center in most developing countries, including Ethiopia [23, 24]. In Ethiopia, a high percentage of cancer patients present with late-stage disease. Two-thirds of them have an unmet supportive care need and reported that they wait at least 2 months to receive cancer treatment services due to limited access to healthcare institutions, a lack of early detection, and the timely initiation of treatments [25].

The assessment of unmet supportive care needs among cancer patients in Ethiopia involves considering risky health behaviors, financial problems, quality of life, increased symptom burden, and self-care capacity, leading to lower quality of life and higher reports of unmet supportive care needs [26–31].

The challenges of cancer treatment services in Ethiopia emanate from the patients themselves, provider-related, facility-related, and technology-related challenges. However, oncology services are inadequate, and the country is not well prepared to bear the growing burden of cancer. Only two fully functioning public radiotherapy centers struggle to serve the entire country [18, 23]. As a result, there is an increased flow of cancer patients from other sites, which leads to an increase in the burden on healthcare providers, prolonging their time to get service, which negatively affects patient needs.

Previous studies conducted in Ethiopia indicate that a majority of cancer patients are dissatisfied with the overall quality of cancer care, with significant variation in the domains of unmet supportive care needs [10, 32]. While prior research has identified gaps in supportive care, critical factors, such as risky health behaviors, financial challenges, and quality of life, have not been adequately explored in the context of unmet needs. Furthermore, much of the existing research has been conducted in Northwest and Central Ethiopia, leaving the Southwest region, including Jimma Medical Center, underrepresented. This regional disparity is particularly important, as differences in healthcare accessibility, resource allocation, and patient demographics may influence the nature and extent of unmet needs, and the shortage of radiation services in Ethiopia exacerbates challenges in providing quality supportive care for cancer patients. While previous studies often emphasize physical and clinical needs, there has been limited investigation into the psychological, social, and sexual domains, which are critical for improving patient outcomes. Additionally, with Ethiopia's rapidly evolving healthcare landscape and the rising burden of cancer, there is a need for updated data that reflect the current context and challenges.

This study aims to fill these gaps by adopting a multidimensional approach that integrates sociodemographic, clinical, and quality-of-life factors to comprehensively assess the unmet supportive care needs and their associated determinants among adult patients with cancer at Jimma Medical Center.

2. Methodology

2.1. Study Area and Period. This study was conducted on adult cancer patients at the Jimma Medical Center, Jimma, Oromia, Ethiopia, from December 01, 2023 to January 01, 2024. The short study duration was primarily due to logistical and budgetary constraints, as well as the continuous patient flow at Jimma Medical Center, which allowed us to achieve an adequate and representative sample within this timeframe [33]. Jimma Medical Center is one of the oldest public hospitals in Jimma City and serves as the only teaching and referral hospital in the southwestern region of Ethiopia. It provides comprehensive cancer care, including surgery, chemotherapy, and hormonal therapy [34]. Additionally, Jimma Medical Center, along with Black Lion Hospital in Addis Ababa, is one of only two centers in Ethiopia offering radiotherapy services. Currently, the adult oncology unit has 28 beds and is staffed by a team that

includes five adult oncologists, three general practitioners, two oncology nurses, six general nurses, three radiation therapists, two pharmacists, one data clerk, and one social worker. The unit effectively provides services for surgery, chemotherapy, and radiotherapy.

2.2. Study Design. An institution-based cross-sectional study design was implemented.

2.2.1. Study Population and Sample Size. Source Population: Adult cancer patients at Jimma Medical Center.

Study Population: Selected adult cancer patients were treated at Jimma Medical Center during the study period.

Inclusion Criteria: Adult cancer patients 18 years old and above who were receiving therapy at the oncology unit for at least 1 month back at Jimma Medical Center.

Exclusion Criteria: Patients who were severely ill and unable to respond to questions.

2.3. Sample Size Determination. The number of samples required for this study was calculated using a single population proportion formula. The assumptions taken to determine the sample size were as follows: marginal error (d) = 5% and a 95% confidence level; the proportion of unmet supportive care needs of cancer patients at Dessie (81%) [32] was used. Again, the sample size for those main predictors from previous literature was calculated separately by Epi Info version 7.2.5.0 with the total number of cancer patients at Jimma Medical Center (620), and the largest sample size was selected [10]. Accordingly, by adding a 10% nonresponse rate, the final sample size was 261.

2.4. Sampling Procedure. All adult cancer patients at Jimma Medical Center who were receiving therapy at the oncology unit for at least 1 month back at Jimma Medical Center were selected for this study. The study participants were consecutively recruited from December 01 to January 01, 2024.

2.4.1. Dependent Variable. Unmet supportive care need domains.

2.4.2. Independent Variable. Sociodemographic characteristics (age, sex, residence area, educational status, marital status, employment status, occupational status, monthly household income, health insurance, and financial burden), risky health behaviors (smoking status, alcohol use, and physical inactivity), clinically related variables (type/site of cancer, time since diagnosis, stage of cancer, type of cancer treatment, side effects of treatment, remission status, and presence of comorbidities), and quality of life.

2.5. Operational Definitions and Definitions of Terms. Cancer: Uncontrolled proliferation of abnormal cells in the body that are capable of metastasizing to neighboring tissues [1].

Supportive Care: The provision of services (psychological, health system and information, physical and daily living, patient care and support, and sexuality) to cancer patients, their immediate families, and caregivers to enable them to deal with the effects of the disease and its treatment and to improve their quality of life [35].

Multidisciplinary Team Approach: This is a patient care model comprising experts from different disciplines to establish shared patient care goals for a more holistic approach to patient care [6].

Early-Stage Cancer: This refers to tumors confined to the primary site with limited local invasion and no distant metastasis. According to the TNM classification, this generally corresponds to stages I and II, where tumor size and regional lymph node involvement are minimal, and distant metastasis is absent [36].

Late-Stage Cancer: This includes tumors that have locally advanced or spread to regional lymph nodes or distant organs. In the TNM classification, this corresponds to stages III and IV, characterized by extensive local invasion, significant lymph node involvement, or distant metastasis [36].

Unmet Supportive Care Needs: A patient is reported to have at least one unmet need for supportive care items [37].

High Quality of Life: If the total patient score on the quality-of-life questionnaire is equal to or below the mean [38].

Low Quality of Life: If the patient scores the quality-of-life questions above the mean [38]

2.6. Data Collection Tools. A face-to-face interview was conducted using standardized questionnaires, which included sociodemographic characteristics, risky health behaviors, clinical characteristics, quality of life, and patients' supportive care needs. It has five major parts. Part one assessed the patient's sociodemographic characteristics. Part two includes questionnaires that assessed the risky health behaviors of the participants, and part three contains the participants' clinically related characteristics. Part four is related to 30 items of the standardized tool of quality of life (EORTC QLQ-C30) that scored from 0 to 100 [15]. After summing up, the questionnaire participants were categorized as having a high quality of life or a low quality of life based on their mean score.

Part five includes supportive care needs questionnaires. The original SCNS-short form has 34 items that have been validated at Hawassa Referral Hospital, which consists of 26 items with an overall Cronbach's alpha of 0.933. The original SCNS questions were further divided into the physical, psychological, health system and information need, Patient Care and Supportive domain, and the sexual need domains. All 26 items were rated on a 5-point Likert scale ("1" for the rating of the item as not applicable, "2" for rating as satisfied, "3" for "low need," "4" for "moderate need," and "5" for "high need"). For each item, participants were categorized as either "not applicable" or satisfied under the heading "no need," and those who responded as "low," "moderate," or "high" need under the heading "having an unmet need" [39]. The inclusion of "low," "moderate," and "high" categories is

supported by validation studies showing that even lower-level unmet needs can negatively affect patients' quality of life and treatment outcomes [40, 41].

2.7. Data Collection Techniques. Selected participants were interviewed face-to-face using a standardized questionnaire. Two BSc nurses were selected from the Shanen Gibe Hospital for data collection after considering their previous experience in data collection. Data regarding the clinically related variables were extracted from a patient card.

2.8. Data Quality Management. The questionnaire prepared in English was translated into the local language (both Afaan Oromo and Amharic) and then back to English by different multilingual translators to ensure consistency. Pretesting was performed ($\alpha = 0.85$) at Black Lion Hospital on 10% of the sample (26 study participants) to check the clarity, feasibility, applicability, understandability, reliability, and coherence of the data.

Two days of training were given to the data collectors on the contents of the questionnaire, data collection methods, and ethical concerns to ensure that all the data collectors had a common understanding and followed the same interview procedures.

Continuous follow-ups and daily reviews of all completed questionnaires were conducted by the principal investigator to ensure the completeness and consistency of the collected data throughout the data collection period.

2.9. Data Processing and Analysis. Each completed questionnaire was manually checked for completeness before data entry. The data were coded, entered into EPI Data Version 4.2, and exported to SPSS Version 26 for analysis. Descriptive and inferential statistics were used for data analysis. Multicollinearity was checked to determine the linear correlation between the independent variables using the variance inflation factor and tolerance. None of the variables yielded a variance inflation factor > 10, tolerance < 0.1 (variance inflation factor ≤ 2.02, or tolerance ≥ 0.495), and they were not excluded from multivariable analyses. Binary logistic regression was also employed to determine the factors associated with patient needs. Binary logistic regression was employed to assess the degree of association between the dependent and independent variables. Multivariable logistic regression analysis was conducted to identify the factors associated with the unmet supportive care needs of patients with cancer. The Hosmer and Lemeshow tests were found to be insignificant (p value = 0.082), and the omnibus test was significant (p value ≤ 0.001), which indicated that the model was fit. Both crude and adjusted odds ratios, along with a 95% CI, were estimated to measure the strength of the association. Statistical significance was set at $p < 0.05$. Finally, the results of the analysis are presented in tables, charts, figures, and narrative text, as appropriate. All statistical analyses were performed using the dataset provided as supporting information (see Supporting File: spss data file.xlsx [available here]).

2.10. Ethical Considerations. The research proposal was submitted to the Jimma University College of Health Science School of Nursing for ethical considerations. The Jimma University Research and Ethics Review Board granted ethical clearance for this study with reference number JUIH/IRB/386/23, which approved the ethics of the research protocol. Ethical clearance was obtained from the research and ethics review board of Jimma University, and a formal letter of cooperation was obtained and submitted to the selected oncology unit. The purpose of the research was explained to each study respondent, and written informed consent was obtained from each study respondent before data collection. Participants were assured that they had the right to refuse at any time, with no incentive or harm for their participation in the study. Privacy and confidentiality of participants were maintained, and the data were collected following the ethical principles for medical research involving human subjects mentioned in the Declaration of Helsinki [42]. This original document content was previously made public only on a preprint server, an institutional repository of Jimma University [43].

3. Result

3.1. Sociodemographic Characteristics of Respondents. Of 261 adult patients with cancer who participated in this study, 257 (98.5%) completed the interview. Of which, 194 (75.5%) were females, 168 (65.4%) were married, 141 (54.9%) were from early adulthood and early middle age, 90 (35%) had no formal education, and 174 (67.7%) had no health insurance. Regarding financial problems related to cancer treatment, 83.7% of participants reported experiencing a financial burden. This was determined based on patient self-report, including any out-of-pocket expenses or treatment delays due to cost (Table 1).

3.2. Risky Health Behavior of Participants With Cancer. Among the study participants, 235 (91.4%) were nonsmokers, 28 (10.9%) were alcohol users, and 253 (98.4%) were not doing physical exercise (Table 2).

3.3. Clinical-Related Characteristics of Respondents. Of the study participants, 86 (33.5%) presented with breast cancer, 103 (40.1%) presented with stage IV regarding cancer treatment modalities, and 225 (87.5%) of participants had a treatment side effect (Table 3).

3.4. Quality of Life Among Cancer Patients. The quality of life of the participants was categorized as high and low quality of life by summing up the quality-of-life questionnaires and dichotomized based on their mean score (the mean score of the quality-of-life questionnaires of the study participants was 77.58). The quality of life among cancer patients shows that 138 (54%) have a low quality of life (Figure 1).

Unmet supportive care needs of individual items of supportive care need among study participants.

Table 1: Sociodemographic characteristics of participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Categories	Frequency (%)
Sex	
Male	63 (24.5)
Female	194 (75.5)
Age	
Early adulthood (18–34)	67 (26.1)
Early middle age (35–44)	74 (28.8)
Late middle age (45–64)	87 (33.8)
Late adulthood (≥ 65)	29 (11.3)
Residence	
Urban	172 (66.9)
Rural	85 (33.1)
Educational status	
No education	90 (35.0)
Primary education	51 (19.8)
Secondary	71 (27.6)
Above secondary	45 (17.5)
Occupation	
Farmer	41 (16.0)
Government employee	54 (21.0)
Self-employee	40 (15.6)
Housewife	100 (38.9)
Merchant	22 (8.6)
Marital status	
Single	18 (7.0)
Married	168 (65.4)
Divorced	22 (8.6)
Widowed	49 (19.1)
Household monthly income	
< 1500	58 (22.6)
1501–3000	82 (31.9)
3001–5000	59 (23.0)
> 5000	58 (22.6)
Health insurance	
Yes	83 (32.3)
No	174 (67.7)
Financial problems related to cancer treatment	
Yes	215 (83.7)
No	42 (16.3)

Among the psychological domain, the most prevalent needs were about fearing the spread of cancer (93.8%), followed by uncertainty about the future (90.7%), and lastly about keeping a positive outlook (66.5%) (Table 4).

Among health system/information domains, the most prevalent was being adequately informed about the benefits and side effects (83.7%), followed by being informed about cancer that is under control or diminishing (79.8%), and lastly about being treated like a person, not just another Case 101 (39.3%). Among the physical need domain, the most prevalent need was not being able to do the thing you used to do (82.9%), followed by work around the home (82.1%), pain (78.6%), and lastly lack of energy/tiredness and feeling unwell most of the time (75.9%) (Table 4).

Among the patient care and supportive domain, the most prevalent unmet needs were hospital staff acknowledging and showing sensitivity to your feelings and emotional needs (63.4%), followed by reassurance by medical staff that you feel normal (61.9%), and lastly, about hospital staff attending promptly to your physical needs (24.9%) (Table 4).

Among the sexual need domain, the most prevalent need was to be given information about sexual relationships (48.6%), followed by both sexuality changes in sexual feeling and changes in one's sexual relationships accounts (47.9%). Almost all the top 10 items were from the psychological need domain (Table 4).

Prevalence of supportive care need domain of patients with cancer at Jimma Medical Center.

The overall mean score level of unmet supportive care needs for cancer care among the participants was 2.80. The most frequent unmet needs of the participants were from the psychological need domain, which accounts for 223 (87.1%), followed by the physiological need domain for 203 (79.1%), health system and information need domain for 163 (63.7%), patient care and supportive domain for 128 (49.4%), and lastly sexual needs for 123 (47.8%) (Figure 2).

Factors associated with unmet supportive care needs in the domain of participants with cancer at Jimma Medical Center.

3.5. Psychological Need Domain. On bivariate analysis, sex, age, occupation, educational status, marital status, income, health insurance, financial problem, stage of cancer, treatment types, side effect, remission, comorbidity, and quality of life were associated with a p-value < 0.25 (Table 5). Then, further in multivariate analysis, lower educational status, treatment side effects, and having a low quality of life were significantly associated with the unmet psychological need domain (Table 6).

3.6. Physical Need Domain. On bivariate analysis, age, educational status, marital status, income, health insurance, financial problem, stage of cancer, treatment types, side effects, remission, and quality of life were associated with a p-value < 0.25 (Table 5). Lower income, financial problems, presented with advanced-stage cancer (stage IV), treatment side effects, and lower quality of life were significantly associated with the unmet physical need domain (Table 6).

3.7. Health Information Need Domain. On bivariate analysis, sex, age, occupation, educational status, marital status, income, and comorbidity were associated with a p-value < 0.25 (Table 5). Low educational status, being married and divorced, and having comorbidity were significantly associated with the unmet physical need domain (Table 6).

3.8. Patient Care and Supportive Domain. On bivariate analysis, residence, occupation, educational status, marital status, financial problem, stage of cancer, treatment types, comorbidity, remission, and quality of life were associated with a p-value < 0.25 (Table 5). Being urban, a farmer, a housewife, self-employed, having no education, and having

Table 2: Risky health behavior of the participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Variable	Category	Frequency (N)	Percentage (%)
Did you smoke cigarettes in your life	Yes	22	8.6
	No	235	91.4
Duration	1–5 years	3	1.2
	> 5 years	19	7.4
Current smokers	Yes	3	1.2
	No	254	98.8
Have you drunk alcohol in your life	Yes	28	10.9
	No	229	89.1
Duration	1–5 years	1	0.4
	> 5 years	27	10.5
Current alcohol users	Yes	1	0.4
	No	4	1.6
Did you do physical exercise in your life	Yes	4	1.6
	No	253	98.4
Currently, you are doing regular exercise	Yes	2	0.8
	No	2	0.8
Restriction	Ill health	36	14.0
	Not interested	144	56.0
	No appropriate place	73	28.4

Table 3: Clinical characteristics of the participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Category	Frequency (%)
Types of cancer	
Breast	86 (33.5)
Cervical	64 (24.9)
Esophageal	31 (12.1)
Colorectal	28 (10.9)
Non-Hodgkin lymphoma	27 (10.5)
Other (lung, liver, ovarian, sarcoma)	21 (8.2)
Stage of cancer	
Stage I	27 (10.5)
Stage II	46 (17.9)
Stage III	88 (34.2)
Stage IV	96 (37.4)
Treatment types	
Chemotherapy	236 (91.8)
Radiotherapy	182 (70.8)
Surgical removal of cancer	73 (28.4)
Duration	
Below 1 year	113 (44.0)
One year −5 years	134 (52.1)
Above 5 years	10 (3.9)
Remission	
Yes	188 (73.2)
No	69 (26.8)
Comorbidity	
Yes	43 (16.7)
No	214 (83.3)
Side effect	
Yes	225 (87.5)
No	32 (12.5)
Types of side effects	
Nausea and vomiting	148 (57.6)
Pain	100 (38.9)
Hair loss	141 (54.9)
Diarrhea	69 (26.4)

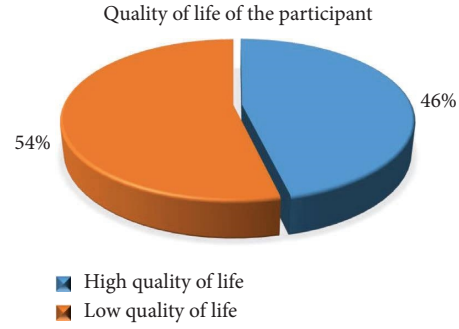

Figure 1: Prevalence of quality of life among participants with cancer at Jimma Medical Center, Oromia, Ethiopia, 2024.

a low quality of life were statistically associated with unmet needs (Table 6).

3.9. Sexual Need Domain. On bivariate analysis, sex, age, marital status, income, health insurance, stage of cancer, comorbidity, and remission were associated with a p-value < 0.25 (Table 5). Being male, married, having health insurance, and comorbidity were statistically associated with the sexual need domain (Table 6).

3.10. Overall Needs. On bivariate analysis, sex, age, occupation, educational status, marital status, health insurance, financial problem, stage of cancer, treatment types, side effects, comorbidity, remission, and quality of life were associated with a p value < 0.25 (Table 5). Early age, low educational status, having health insurance, being presented with financial problems, having treatment side effects, and those with low quality of life were significantly associated with unmet supportive care needs (p value < 0.05) (Table 6).

Table 4: Unmet supportive care needs of individual items of supportive care need among study participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Unmet supportive care needs	Frequency (%)
Psychological domain	
Anxiety	215 (83.7%)
Feeling down or depressed	216 (84%)
Feeling sadness	209 (81.3%)
Fearing the spread of cancer	241 (93.8%)
Worry about the treatment beyond control	190 (73.9%)
Uncertainty about the future	233 (90.7%)
Learning to feel in control of your situation	232 (90.3%)
Keeping a positive outlook	171 (66.5%)
Feeling about death and dying	215 (83.7%)
Concern about the worries of those you	217 (84.4%)
Health system/information	
Being adequately informed about the benefits and side effects	215 (83.7%)
Being informed about test results as soon as feasible	155 (60.3%)
Being informed about cancer that is under control or diminishing	205 (79.8%)
Being informed about things you can do to help yourself get well	142 (55.3%)
Being treated like a person, not just another case	101 (39.3%)
Physical need domain	
Pain	202 (78.6%)
Lack of energy/tiredness	195 (75.9%)
Feeling unwell most of the time	195 (75.9%)
Work around the home	211 (82.1%)
Not being able to do things you used to do	213 (82.9%)
Patient care and supportive domain	
Reassurance by medical staff that you feel normal	159 (61.9%)
Hospital staff are attending promptly to your physical needs	64 (24.9%)
Hospital staff acknowledging and showing sensitivity to your feelings and emotional need	163 (63.4%)
Sexual domain	
Sexuality changes in sexual feeling	123 (47.9%)
Changes in your sexual relationships	123 (47.9%)
To be given information about sexual relationships	125 (48.6%)

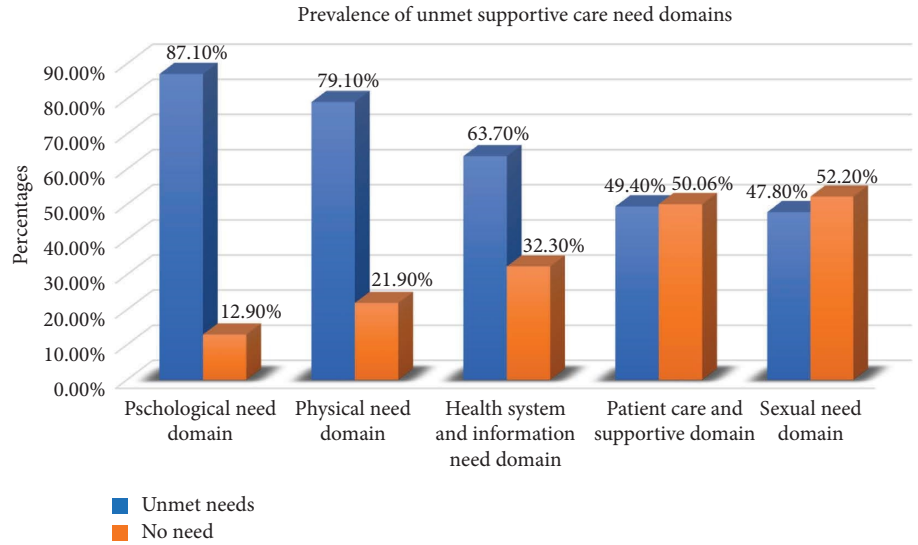

Figure 2: Prevalence of supportive care needs in a domain of participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Table 5: Bivariate logistic regression of variables associated with unmet supportive care needs among oncology patients at JMC, Jimma, Ethiopia, 2024 ($N = 257$).

Variable		Unmet supportive care needs					
		Psychological	Physical	Health information	Patient care and supportive domain	Sexual	Overall unmet
Sex	Male	2.59 (1.192–5.62)		1.49 (0.80–2.77)		2.23 (1.2–4.3)	1.92 (1.01–3.67)
	Female	1		1		1	1
Age (years)	18–34	1.91 (0.78–4.69)	1.46 (0.6–3.53)	3.44 (1.33–8.87)		12.84 (3.53–46.69)	3.44 (1.33–8.87)
	35–44	2.35 (0.96–5.777)	2.53 (1.02–6.24)	5.47 (2.12–14.12)		18.06 (4.97–65.62)	5.47 (2.12–14.12)
	45–64	1.40 (0.60–3.27)	1.4 (0.6–3.27)	2.34 (0.94–5.85)		4.56 (1.28–16.3)	2.34 (0.94–5.85)
	≥ 65	1	1	1		1	1
Residence	Urban				2.46 (1.4–4.2)		—
	Rural				1		—
Occupation	Farmer	0.98 (0.34–2.80)		2.73 (0.94–7.99)	1.93 (0.67–5.5)		1.53 (0.54–4.35)
	Government employee	1.98 (0.69–5.63)		0.61 (0.21–1.77)	1.25 (0.46–3.38)		1.29 (0.48–3.49)
	Self-employee	3.26 (1.005–10.59)		2.63 (0.90–7.67)	4.0 (1.28–12.5)		3.6 (1.2–10.5)
	Housewife	1.18 (0.46–3.02)		1.27 (0.49–3.29)	1.38 (0.55–3.48)		1.0 (0.41–2.58)
	Merchant	1		1	1		1
Educational status	No education	3.47 (1.64–7.32)	1.44 (0.7–2.97)	1.80 (0.83–3.88)	0.53 (0.26–1.10)		1.6 (0.76–3.38)
	Primary	4.8 (2.01–11.51)	2.56 (1.08–6.0)	2.99 (1.28–7.00)	1.76 (0.75–4.15)		3.1 (1.34–7.16)
	Secondary	6.71 (2.9–15.53)	2.4 (1.09–5.26)	2.26 (1.02–5.01)	2.12 (0.95–4.76)		5.1 (2.28–11.4)
	> Secondary	1	1	1	1		1
Marital status	Single	1.58 (0.57–4.39)	1.33 (0.49–3.6)	0.40 (0.15–1.08)	0.43 (0.16–1.15)	1.6 (0.54–4.75)	0.89 (0.3–2.38)
	Married	1.75 (0.89–3.45)	1.7 (0.8–3.25)	0.44 (0.23–0.87)	0.99 (0.50–1.95)	5.63 (2.6–12.1)	2.06 (1.06–4.00)
	Divorced	0.77 (0.27–2.20)	0.77 (0.27–2.2)	0.40 (0.14–1.14)	1.47 (0.48–4.5)	1.13 (0.33–3.83)	1.56 (0.56–4.41)
	Widowed	1	1	1	1	1	1
Income (ETB)	< 1500	0.56 (0.27–1.19)	0.4 (0.19–0.99)	1.57 (0.73–3.37)		0.62 (0.3–1.28)	
	1501–3000	1.13 (0.56–2.32)	0.34 (0.16–0.71)	2.2 (1.1–4.50)		0.64 (0.32–1.25)	
	3001–5000	2.58 (1.08–6.15)	1.02 (0.43–2.4)	2.3 (1.08–4.91)		0.84 (0.41–1.74)	
	> 5000	1	1	1		1	
Health insurance	Yes	0.58 (0.34–1.0)	0.68 (0.4–1.18)			1.6 (0.54–4.75)	0.52 (0.3–0.87)
	No	1	1			1	1

Table 5: Continued.

Variable		Unmet supportive care needs					
		Psychological	Physical	Health information	Patient care and supportive domain	Sexual	Overall unmet
Financial problem	Yes	3.89 (1.96–7.7)	4.1 (2.06–8.2)		2.2 (1.1–4.32)		3.99 (1.91–8.36)
	No	1	1		1		1
Stage of cancer	Stage I	0.54 (0.22–1.3)	0.23 (0.09–0.6)		0.49 (0.21–1.17)	0.5 (0.21–1.19)	0.56 (0.24–1.34)
	Stage II	0.27 (0.13–0.56)	0.1 (0.03–0.18)		0.5 (0.24–1.02)	0.22 (0.1–0.48)	0.21 (0.1–0.46)
	Stage III	0.75 (0.39–1.45)	0.27 (0.1–0.57)		0.72 (0.39–1.33)	0.52 (0.29–0.94)	0.6 (0.33–1.1)
	Stage IV	1	1		1	1	1
Treatment types	Chemotherapy	0.49 (0.21–1.15)	0.85 (0.37–1.96)		0.43 (0.2–0.99		0.56 (0.25–1.24)
	Chemo + radiotherapy	0.97 (0.44–2.13)	1.18 (0.56–2.46)		0.8 (0.38–1.68)		1.33 (0.67–2.67)
	Chemo + surgery	0.12 (0.07–0.59)	0.3 (0.12–0.97)		0.5 (0.2–1.5)		0.23 (0.1–0.75)
	Chemo + radiation + surgery	1	1		1		1
Side effect	Yes	2.67 (1.26–5.66)	3.93 (1.8–8.49)				2.85 (1.29–6.3)
	No	1	1				1
Comorbidity	Yes	1.01 (0.50–2.03)		0.43 (0.21–0.89)	0.48 (0.25–0.9)	0.47 (0.2–0.93)	0.5 (0.263–0.10)
	No	1		1	1	1	1
Remission	Yes	0.48 (0.25–0.91)	0.5 (0.26–0.94)		0.68 (0.38–1.2)	0.67 (0.39–1.17)	0.7 (0.41–1.25)
	No	1	1		1	1	1
Quality of life	High	0.09 (0.05–0.17)	0.13 (0.07–0.2)		0.39 (0.2–0.65)		0.27 (0.16–0.44)
	Low	1	1		1		1

Table 6: Multivariable logistic regression of variables associated with unmet supportive care needs among participants with cancer at Jimma Medical Center, Jimma, Oromia, Ethiopia, 2024 ($N = 257$).

Variable		Unmet supportive care needs					
		Psychological	Physical	Health information	Patient care and supportive domain	Sexual	Overall unmet
Sex	Male	—	—	—	—	2.30 (1.12–4.73)*, $p = 0.023$	—
	Female	—	—	—	—	1	—
Age (years)	18–34	—	—	—	—	—	3.74 (1.29–10.79)*, $p = 0.015$
	35–44	—	—	—	—	—	3.69 (1.97–16.41)*, $p = 0.001$
	45–64	—	—	—	—	—	2.63 (0.95–7.29)*, $p = 0.062$
	≥ 65	—	—	—	—	—	1
Residence	Urban	—	—	—	2.02 (1.01–3.83)*, $p = 0.031$	—	—
	Rural	—	—	—	1	—	—
Occupation	Farmer	—	—	—	4.47 (1.31–15.23)*, $p = 0.017$		—
	Government employee	—	—	—	1.12 (0.372–3.37)	—	—
	Self-employee	—	—	—	7.05 (1.93–25.72)*, $p = 0.003$	—	—
	Housewife	—	—	—	3.21 (1.08–9.56)*, $p = 0.036$	—	—
	Merchant	—	—	—	1	—	—
Educational status	No education	4.01 (1.63–9.85)*, $p = 0.001$	—	1.88 (0.84–4.19)	0.31 (0.12–0.80)*, $p = 0.015$	—	1.21 (0.51–2.86)
	Primary	5.49 (1.97–15.32)*, $p = 0.002$	—	3.62 (1.47–8.91)*, $p = 0.005$	1.23 (0.46–3.29)	—	3.02 (1.15–7.91)*, $p = 0.025$
	Secondary	5.99 (2.24–16.02)*, $p \leq 0.001$	—	2.69 (1.16–6.23)*, $p = 0.021$	1.41 (0.58–3.45)	—	3.98 (1.57–10.08)*, $p = 0.004$
	> Secondary	1	—	1	1	—	1

Table 6: Continued.

Variable		Unmet supportive care needs					
		Psychological	Physical	Health information	Patient care and supportive domain	Sexual	Overall unmet
Marital status	Single	—	—	0.39 (0.14–1.08)	—	1.27 (0.417–3.89)	—
	Married	—	—	0.38 (0.19–0.77)*, $p = 0.007$	—	6.64 (2.9–14.8)* $p \leq 0.001$	—
	Divorced	—	—	0.29 (0.10–0.88)*, $p = 0.029$	—	1.11 (0.32–3.90)	—
	Widowed	—	—	1	—	1	—
Health insurance	Yes	—	—	—	—	0.41 (0.23–0.76)* $p = 0.004$	0.53 (0.28–0.99)*, $p = 0.048$
	No	—	—	—	—	1	1
Financial problem	Yes	—	3.78 (1.506–9.50)*, $p = 0.005$	—	—	—	2.65 (1.12–6.31)*, $p = 0.027$
	No	—	1	—	—	—	1
Stage of cancer	Stage I	—	0.38 (0.13–1.17)*, $p = 0.092$	—	—	—	—
	Stage II	—	0.16 (0.06–0.42)*, $p \leq 0.001$	—	—	—	—
	Stage III	—	0.36 (0.16–0.81)*, $p = 0.014$	—	—	—	—
	Stage IV	—	1	—	—	—	—
Side effect	Yes	3.14 (1.23–7.99)*, $p = 0.016$	3.27 (1.12–9.57)*, $p = 0.030$	—	—	—	2.65 (1.03–6.83)*, $p = 0.044$
	No	1	1	—	—	—	1
Comorbidity	Yes	—	—	0.41 (0.19–0.87)*, $p = 0.02$	—	0.36 (0.17–0.77), $p = 0.008$	—
	No	—	—	1	—	1	—
Quality of life	High	0.09 (0.045–0.18)*, $p \leq 0.001$	0.18 (0.09–0.36)*, $p \leq 0.001$	—	0.32 (0.18–0.57)* $p \leq 0.001$	—	0.31 (0.17–0.55)*, $p \leq 0.001$
	Low	1	1	—	1	—	1

Note: 1 indicated reference group.
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio.
*Variables statistically significant at $p < 0.05$.

4. Discussion

This study assessed the most prevalent domain of unmet supportive care needs and its associated factors among cancer patients at Jimma Medical Center. The findings of this study revealed that psychological need domains were the most prevalent unmet supportive care needs, which is similar to a study conducted in Ethiopia at Dessie [32], Kenya [38], Japan [29], and the United States [44]. This might be because psychological needs are not considered to be as important as physical needs, and are not fully considered. This focuses on increasing the integration of mental health services or specialized counseling centers within cancer treatment facilities, and considering local context, beliefs, and values when providing psychological support to cancer patients for a reduction in the unmet needs of cancer patients. To better understand the psychological dimension of unmet supportive care needs, we applied the Mindsponge theory, which explains how individuals process information based on cognitive and emotional filters shaped by their experiences and beliefs. The Mindsponge theory is a psychological framework that explains how individuals process information through cognitive and emotional filters, influenced by their experiences and beliefs. It helps understand the psychological dimension of unmet supportive care needs and why patients may perceive their psychological needs as unmet, even if healthcare providers believe they are providing adequate care. The theory suggests that patients' perceptions of unmet psychological needs may stem from a cognitive filtering process where their expectations and prior experiences do not align with the care provided. Strategies for addressing unmet psychological needs include tailored communication and more empathetic care.

The findings of this study show that the physical domain becomes the second-top unmet need domain. This study finding is in line with the study findings in Dessie, Nigeria, Japan, Iraq, China, and the United States [28, 29, 32, 44–46]. The explanation could be that cancer patients undergoing treatment modalities, such as chemotherapy, radiation, and surgery, can often experience various physical side effects that significantly affect a patient's daily functioning and reduce the patient's ability to tolerate and adhere to treatment protocols [47]. This emphasizes that nurses should prioritize interventions addressing physical side effects, collaborate with multidisciplinary teams, educate patients, offer complementary therapies, develop personalized rehabilitation programs, and monitor patients' physical status for comprehensive care and psychological support.

The findings of this study show that sexual need domains became the least unmet supportive care needs, which is similar to study findings in Ethiopia at Gondar and Addis [48, 49], Nigeria [28], Japan [29], and China [45]. The explanation could be that patients' perception of sexual needs as a low priority is influenced by cultural values and norms that discourage discussing sexuality. This cultural difference may hinder the accurate reflection of the actual status. However, it is essential to address this issue as certain sexual problems can have a significant negative impact on psychological well-being and quality of life [50].

The finding of this study shows that there is an inverse relationship between age and unmet supportive care needs. As age increases, there is a decrease in unmet supportive care needs, which is similar to study findings in Malaysia [51], Jordan [52, 53], and Iran [54]. This might be due to younger patients having more expectations about their health condition. But older adults may have more experience with illness and may be more likely to have developed coping mechanisms [55].

This study shows that there are gender differences in unmet supportive care needs across domains. Males tend to report higher unmet needs in the sexual domain (similar to findings from Jordan [53]), whereas differences are observed in other domains such as health system and information, where males reported higher unmet needs in Ethiopia at Gondar [28] and in Iran [3]. Conversely, females showed higher unmet needs in the psychological domain, consistent with findings from Dessie [32], the United States [44], and Japan [29]. Regarding gender differences overall, there is still no consensus on the influence of gender on unmet supportive care needs across domains.

This study shows there is a statistical association between the residence area of the participants and the patient care and supportive need domain. Being urban has high unmet patient care and supportive domain needs that those residing in rural areas do not have, which contradicts a study conducted in Ethiopia at Gondar and Addis [48, 49]. This might be due to those who live in urban areas having access to and searching for more information from social media and being eager to get all the needed and updated information about their disease status [56]. This emphasis, as healthcare providers and policymakers work toward reducing disparities in patient care and supportive needs between urban and rural areas, ultimately improves outcomes and quality of life for all cancer patients.

The findings of this study show there is an association between marital status and unmet health system and information needs, and the sexual need domain. There are high unmet needs of those married participants in the sexual need domain, which is similar to the study conducted in Ethiopia at Addis [49], Ghana [57], Kenya [58], Jordan [52], and Malaysia [51]. This might be due to the majority of them being in reproductive age groups and needing sexual activities than others who need high supportive care for their sexual behavior. Nurses should offer comprehensive sexual health education to married patients, covering intimacy, contraception, fertility, and cancer treatment. They should create a safe environment, assess patients' needs, and stay updated on cancer care research.

This study shows participants with low educational status had higher unmet needs of psychological, health system and information, patient care and support domain, and overall supportive care needs than those with secondary education, which is similar to a study conducted in Ethiopia at Addis [49], Kenya [58], China [45], and Malaysia [51]. This might be because those who have low education have a low level of understanding about their disease status, poor adherence, and acceptance of their health status, and have

high psychological unmet needs [59]. Nurses should enhance health literacy for low-educated patients through clear language, interactive teaching methods, and encouraging questions; provide counseling, psychotherapy, and support groups; advocate for simplified care processes; and enhance their skills.

The findings of this study show there is an association between the unmet sexual need domain and overall unmet supportive care needs and health insurance. Those uninsured participants were more likely to have high unmet supportive care needs than those who had health insurance, which is in line with study findings in Kenya [60] and Iran [54]. This might be due to uninsured patients having difficulty accessing supportive care services, as they may not be able to afford the cost of care or may not be aware of the available services [61]. The patients should have a regular doctor or nurse who can help them identify and meet their needs for supportive care.

The findings of this study show there is an association between the physical need domain and overall unmet supportive care needs with financial burdens related to cancer treatments. Those who have financial difficulty have higher unmet supportive care needs than those who have no financial burdens in their cancer treatment, which is similar to study findings in Ethiopia [62], Kenya [60], Iran [54], Indonesia [63], New York [64], the United Kingdom [65], and Australia [66]. This could be due to the nature of cancer treatment, inadequate radiation machines in all cancer treatment centers, which end lifelong care with high costs and impose financial hardship, reduce quality of life, cause emotional distress, and interrupt access to cancer care with high unmet supportive care needs [67]. Nurses can assist cancer patients in managing their financial burdens by providing financial counseling, connecting them with local resources, serving as navigators, educating them about treatment financial aspects, and collaborating with healthcare institutions.

The findings of this study show participants presented with advanced stage, particularly stage IV, have a high unmet physical need domain, which is similar to studies conducted in Ethiopia at Dessie and Addis [26, 40], and Malaysia [68]. This might be due to patients with advanced-stage cancer disease having complicated and long-term treatment, and a lower survival probability. Nurses should evaluate patients' physical needs, create personalized care plans, implement pain management, offer mobility support, collaborate with dietitians for nutritional plans, educate patients about symptoms, and maintain clear communication channels to ensure timely and coordinated care for advanced-stage cancer patients.

The findings of this study show participants with side effects related to cancer treatment had high unmet needs in psychological, physical, and overall supportive care need domains, which is similar to study findings in the Netherlands [69], Malaysia [68], and Asia [70]. These might be side effects that have huge impacts on all supportive care needs, especially in the physical need domain, such as headaches, fatigue, weakness, hair loss, nausea, vomiting, diarrhea, abdominal cramps, memory impairment, numbness, and psychological disturbance [71]. Nurses should create comprehensive symptom management protocols for common side effects of cancer treatment, educate patients and caregivers, encourage active participation, connect patients with supportive resources, teach coping strategies, and promote resilience.

This study shows that cancer patients who have comorbidities have fewer unmet needs in the health system and information domain. There are also fewer unmet needs in the patient care and supportive domain, which is similar to a study conducted in Jordan [53]. This might be because patients with another comorbidity often have more interactions with the healthcare system, which may lead to a better understanding of their needs and more support in navigating the healthcare system [72]. Nurses should be more aware of available resources and support services for cancer patients with comorbidities to reduce unmet needs in the information and patient care and supportive domains.

The findings of this study show that participants' quality of life is associated with psychological, physical, patient care and supportive domain, and overall unmet supportive care needs. Participants with low quality of life had high unmet needs, which is similar to study findings in Ethiopia [10], Kenya [38, 58], Asia [73], Ireland [74], Jordan [53], (Chicago) the United States [44], Asia [70], Canada [8], and the United Kingdom [75]. Individuals with low quality of life experience a lot of distress, poor decision-making, and social isolation, such as loneliness and financial hardship, which causes them to have high reports of unmet supportive care needs [76]. Nurses should evaluate patients' quality of life, considering the psychological, physical, and Patient Care and Supportive domains. They should monitor changes, educate patients on strategies, provide self-care information, and advocate for patients' needs within the healthcare system.

4.1. Strengths and Limitations of the Study. Due to the nature of the study design, this study provides valuable information about the relationship between two or more variables and the distribution of a particular characteristic in a population over a short period. As the study included participants from all of Ethiopia outside the catchment area, the results can be generalized to the larger population of patients with cancer but the cause-and-effect relationship could not be established. The 1-month recruitment period may have limited representativeness, and the inclusion of "low need" as unmet need could have slightly inflated prevalence estimates.

5. Implications for the Nurses

The findings of this study have several implications for nurses. Nurses need to be aware of the factors that contribute to unmet needs in cancer patients and be able to provide supportive care through providing emotional support, managing physical symptoms, and connecting patients with social support services. Nursing education programs need to include content on supportive care for cancer patients and the skills needed to provide supportive care. Policymakers

need to be aware of the unmet supportive care needs of cancer patients and take steps to address these needs. This includes providing adequate funding for supportive care services, ensuring that cancer patients have access to these services, and developing policies that support the provision of supportive care.

6. Conclusion and Recommendations

The findings of this study revealed that the psychological need domains were the most prevalent unmet supportive care needs, followed by the physical and daily living domain and lastly sexual need domain, and factors, such as age, residence, educational status, marital status, occupation, health insurance, financial burden, stage of cancer disease, treatment side effects, and quality of life among cancer patients, were associated with having unmet supportive care needs across the domain. Therefore, healthcare providers should pay due attention to young age, being married, not being insured, having financial problems, presenting with advanced-stage cancer, having another comorbid disease along with cancer, treatment side effects, and low quality of life through individualized patient-centered care to meet their needs.

Nomenclature

AOR	Adjusted odds ratio
CI	Confidence interval
COR	Crude odds ratio
EORTC	European Organization For Research And
QLQ	Treatment
SD	Standard deviation
QoL	Quality of life
SCN	Supportive care needs

Data Availability Statement

The datasets used and/or analyzed during this study are available online in Supporting information labeled as SPSS data file.

Ethics Statement

The study protocol was approved by the Research Ethics Committee of Jimma Medical Center. No study procedures were performed before obtaining all participants' written and informed consent.

Consent

Please see the Ethics Statement.

Disclosure

All authors read and approved the manuscript for submission. The authors have full control of all primary data and agree to allow the journal to review the data, if necessary.

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contributions

Frezer Kedir has made substantial contributions to the conception and design of the work; acquisition, analysis, and reviewing the report and manuscript. Ebrahim Yimam contributed to drafting the work and revised the manuscript. Sadik Abdulwehab participated in the acquisition, analysis, and interpretation of data and reviewed the report and manuscript. Yeshitila Belay contributed to the method design and the creation of new software used in the work of drafting, and reviewing the report and manuscript. Admasu Belay contributed to the method design, interpretation of data, and reviewing the report and manuscript. Tables 1, 2, 3, 4, 5, 6 and Figures 1 and 2 were prepared by Frezer Kedir and Sadik Abdulwehab.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. *(Supporting Information)*

Supporting file.xlsx: SPSS data file containing the anonymized dataset used for all statistical analyses presented in this manuscript.

References

[1] WHO, "Cancer [Internet]," (2022), https://www.who.int/health-topics/cancer.

[2] F. Bray, M. Laversanne, E. Weiderpass, and I. Soerjomataram, "The Ever-Increasing Importance of Cancer as a Leading Cause of Premature Death Worldwide," *Cancer* 127, no. 16 (2021): 3029–3030, https://doi.org/10.1002/cncr.33587.

[3] F. Jabbarzadeh Tabrizi, A. Rahmani, M. Asghari Jafarabadi, M. Jasemi, and A. Allahbakhshian, "Unmet Supportive Care Needs of Iranian Cancer Patients and Its Related Factors," *Journal of Caring Sciences* 5, no. 4 (2016): 307–316, https://doi.org/10.15171/jcs.2016.032.

[4] H. Sung, J. Ferlay, R. L. Siegel, et al., "Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries," *CA: A Cancer Journal for Clinicians* 71, no. 3 (2021): 209–249, https://doi.org/10.3322/caac.21660.

[5] T. Afework, B. Seid, A. Anteneh, W. Ayele, S. H. Gebreyesus, and B. S. Endris, "Burden of Mortality From Cancer Among Adults in Addis Ababa, Ethiopia, Using Verbal Autopsy, 2007–2017," *Ecancermedicalscience* 16 (2022): 1428, https://doi.org/10.3332/ecancer.2022.1428.

[6] F. Scotté, A. Taylor, and A. Davies, "Supportive Care: the "Keystone" of Modern Oncology Practice," *Cancers (Basel)* 15, no. 15 (2023): 3860, https://doi.org/10.3390/cancers15153860.

[7] I. M. Alananzeh, J. V. Levesque, C. Kwok, Y. Salamonson, and B. Everett, "The Unmet Supportive Care Needs of Arab Australian and Arab Jordanian Cancer Survivors: An International Comparative Survey," *Cancer Nursing* 42, no. 3 (2019): E51–E60, https://doi.org/10.1097/NCC.0000000000000609.

[8] M. I. Fitch and J. Maamoun, "Unmet Supportive Care Needs and Desire for Assistance in Patients Receiving Radiation Treatment: Implications for Oncology Nursing," *Canadian Oncology Nursing Journal* 26, no. 1 (2016): 53–59, https://doi.org/10.5737/236880762615359.

[9] D. Hui, G. Hoge, and E. Bruera, "Models of Supportive Care in Oncology," *Current Opinion in Oncology* 33, no. 4 (2021): 259–266, https://doi.org/10.1097/CCO.0000000000000733.

[10] T. M. Abegaz, A. A. Ayele, and B. M. Gebresillassie, "Health Related Quality of Life of Cancer Patients in Ethiopia," *Journal of Oncology* 2018 (2018): 1–8, https://doi.org/10.1155/2018/1467595.

[11] P. T. Okediji, O. Salako, and O. O. Fatiregun, "Pattern and Predictors of Unmet Supportive Care Needs in Cancer Patients," *Cureus* 9, no. 5 (2017): e1234, https://doi.org/10.7759/cureus.1234.

[12] C. Lammersfeld, "Cancer Supportive Care Improves Quality of Life and Symptom Management | CTCA | City of Hope [Internet]," (2023), https://www.cancercenter.com/community/blog/2020/12/cancer-supportive-care.

[13] S. T. Memirie, M. K. Habtemariam, M. Asefa, et al., "Estimates of Cancer Incidence in Ethiopia in 2015 Using Population-Based Registry Data," *Journal of Global Oncology* 4 (2018): 1–11, https://doi.org/10.1200/JGO.17.00175.

[14] L. Heckel, K. M. Fennell, J. Reynolds, et al., "Unmet Needs and Depression Among Carers of People Newly Diagnosed With Cancer," *European Journal of Cancer* 51, no. 14 (2015): 2049–2057, https://doi.org/10.1016/j.ejca.2015.06.129.

[15] A. Akalin and G. Pinar, "Unmet Needs of Women Diagnosed With Gynecologic Cancer: an Overview of Literature," *Journal of Palliative Care & Medicine* 6, no. 2 (2016): http://www.omicsgroup.org/journals/unmet-needs-of-women-diagnosed-with-gynecologic-cancer-an-overview-ofliterature-2165-7386-1000249.php?aid=70037, https://doi.org/10.4172/2165-7386.1000249.

[16] N. H. Hart, F. Crawford-Williams, M. Crichton, et al., "Unmet Supportive Care Needs of People With Advanced Cancer and Their Caregivers: A Systematic Scoping Review," *Critical Reviews in Oncology* 176 (2022): 103728, https://doi.org/10.1016/j.critrevonc.2022.103728.

[17] K. C. Chung, A. Muthutantri, G. G. Goldsmith, M. R. Watts, A. E. Brown, and D. L. Patrick, "Symptom Impact and Health-Related Quality of Life (HRQoL) Assessment by Cancer Stage: A Narrative Literature Review," *BMC Cancer* 24, no. 1 (2024): 884, https://doi.org/10.1186/s12885-024-12612-z.

[18] W. Haileselassie, T. Mulugeta, W. Tigeneh, M. Kaba, and W. L. Labisso, "The Situation of Cancer Treatment in Ethiopia: Challenges and Opportunities," *Journal of Cancer Prevention* 24, no. 1 (2019): 33–42, https://doi.org/10.15430/JCP.2019.24.1.33.

[19] J. J. Fulton, T. W. LeBlanc, T. M. Cutson, et al., "Integrated Outpatient Palliative Care for Patients With Advanced Cancer: A Systematic Review and Meta-Analysis," *Palliative Medicine* 33, no. 2 (2019): 123–134, https://doi.org/10.1177/0269216318812633.

[20] U. Goerling, C. Bergelt, V. Müller, and A. Mehnert-Theuerkauf, "Psychosocial Distress in Women With Breast Cancer and Their Partners and Its Impact on Supportive Care Needs in Partners," *Frontiers in Psychology* 11 (2020): 564079, https://doi.org/10.3389/fpsyg.2020.564079.

[21] S. J. Mayo, R. Ajaj, and A. Drury, "Survivors' Preferences for the Organization and Delivery of Supportive Care After Treatment: An Integrative Review," *European Journal of Oncology Nursing* 54 (2021): 102040, https://doi.org/10.1016/j.ejon.2021.102040.

[22] M. Fjell, A. Langius-Eklöf, M. Nilsson, Y. Wengström, and K. Sundberg, "Reduced Symptom Burden With the Support of an Interactive App During Neoadjuvant Chemotherapy for Breast Cancer—A Randomized Controlled Trial," *Breast* 51 (2020): 85–93, https://doi.org/10.1016/j.breast.2020.03.004.

[23] K. Abdella, "National Cancer Control Plan of Ethiopia," (2016), https://www.scribd.com/document/783027839/NCCP-Ethiopia-Final-261015.

[24] M. Abdel-Wahab, S. S. Gondhowiardjo, A. A. Rosa, et al., "Global Radiotherapy: Current Status and Future Directions—White Paper," *JCO Global Oncology* 7 (2021): 827–842, https://doi.org/10.1200/go.21.00029.

[25] J. Feuchtner, A. Mathewos, A. Solomon, et al., "Addis Ababa Population-Based Pattern of Cancer Therapy, Ethiopia," *PLoS One* 14, no. 9 (2019): e0219519, https://doi.org/10.1371/journal.pone.0219519.

[26] M. L. Hsu, M. C. Boulanger, S. Olson, et al., "Unmet Needs, Quality of Life, and Financial Toxicity Among Survivors of Lung Cancer," *JAMA Network Open* 7, no. 4 (2024): e246872, https://doi.org/10.1001/jamanetworkopen.2024.6872.

[27] A. Schnabel, F. Lordick, P. Oberth, et al., "Supportive Care Needs and Health-Related Quality of Life in Cancer Patients Receiving Palliative Care," *Frontiers in Psychology* 14 (2023): 1166801, https://doi.org/10.3389/fpsyg.2023.1166801.

[28] O. Fatiregun, A. C. Sowunmi, M. Habeebu, et al., "Prevalence and Correlates of Unmet Supportive Needs of Nigerian Patients With Cancer," *Journal of Global Oncology* 5 (2019): 1–9, https://doi.org/10.1200/JGO.19.00043.

[29] M. Okamura, M. Fujimori, A. Sato, and Y. Uchitomi, "Unmet Supportive Care Needs and Associated Factors Among Young Adult Cancer Patients in Japan," *BMC Cancer* 21, no. 1 (2021): 17, https://doi.org/10.1186/s12885-020-07721-4.

[30] A. Di Meglio, J. Havas, A. S. Gbenou, et al., "Dynamics of Long-Term Patient-Reported Quality of Life and Health Behaviors After Adjuvant Breast Cancer Chemotherapy," *Journal of Clinical Oncology* 40, no. 27 (2022): 3190–3204, https://doi.org/10.1200/JCO.21.00277.

[31] K. Wang, "Smoking Increases Risks of All-Cause and Breast Cancer Specific Mortality in Breast Cancer Individuals: A Dose-Response Meta-Analysis of Prospective Cohort," *Oncotarget* (2016): https://www.oncotarget.com/article/13366/text/.

[32] H. Y. Amane, A. M. Tessema, K. A. Seid, et al., "Factors Associated With Unmet Supportive Care Needs of Oncology Patients at Dessie Referral Hospital, 2020," *Ecancermedicalscience* 15 (2021): 1300, https://doi.org/10.3332/ecancer.2021.1300.

[33] J. W. Creswell and J. D. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (SAGE Publications, 2018).

[34] D. F. Hordofa, K. T. Daba, and A. A. Mengesha, "Clinical Presentation of Retinoblastoma in Ethiopia: A Case of Jimma University Medical Center Pediatric Oncology Unit, Southwest Ethiopia," *Ethiopian Journal of Health Sciences* 31, no. 5 (2021): 963–968, https://doi.org/10.4314/ejhs.v31i5.7.

[35] M. Taberna, F. Gil Moncayo, E. Jané-Salas, et al., "The Multidisciplinary Team (MDT) Approach and Quality of Care," *Frontiers in Oncology* 10 (2020): 85, https://doi.org/10.3389/fonc.2020.00085.

[36] B. O'Sullivan, J. Brierley, D. Byrd, et al., "The TNM Classification of Malignant Tumours-Towards Common Understanding and Reasonable Expectations," *The Lancet Oncology* 18, no. 7 (2017): 849–851, https://doi.org/10.1016/S1470-2045(17)30438-2.

[37] D. Hui, "Definition of Supportive Care: Does the Semantic Matter?" *Current Opinion in Oncology* 26, no. 4 (2014): 372–379, https://doi.org/10.1097/CCO.0000000000000086.

[38] A. L. Ruth and U. O. Nairobi, "Association Between Unmet Supportive Care Needs and Quality of Life Among Patients With Breast Cancer at Kenyatta National Hospital, Kenya" (2020).

[39] T. Afework, A. Wondimagegnehu, N. Alemayehu, E. J. Kantelhardt, and A. Addissie, "Validity and Reliability of the Amharic Version of Supportive Care Needs Survey-Short Form 34 Among Cancer Patients in Ethiopia," *BMC Health Services Research* 21, no. 1 (2021): 484, https://doi.org/10.1186/s12913-021-06512-2.

[40] A. Boyes, A. Girgis, and C. Lecathelinais, "Brief Assessment of Adult Cancer Patients' Perceived Needs: Development and Validation of the 34-Item Supportive Care Needs Survey (SCNS-SF34)," *Journal of Evaluation in Clinical Practice* 15, no. 4 (2009): 602–606, https://doi.org/10.1111/j.1365-2753.2008.01057.x.

[41] T. Okuyama, T. Akechi, H. Yamashita, et al., "Reliability and Validity of the Japanese Version of the Short-Form Supportive Care Needs Survey Questionnaire (SCNS-SF34-J)," *Psycho-Oncology* 18, no. 9 (2009): 1003–1010, https://doi.org/10.1002/pon.1482.

[42] Association (WMA) WM, "Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects," *Jahrbuch für Wissenschaft und Ethik* 14, no. 1 (2009): 233–238, https://www.wma.net/policies-post/wma-declaration-of-helsinki/, https://doi.org/10.1515/9783110208856.233.

[43] K. Frezer, Y. Ebrahim, and B. Admasu, "Unmet Supportive Care Need and Associated Factors Among Adult Cancer Patients at Jimma Medical Center, Oromia, Southwest Ethiopia," (2023), https://repository.ju.edu.et//handle/123456789/9175.

[44] P. I. Moreno, A. G. Ramirez, S. L. San Miguel-Majors, et al., "Unmet Supportive Care Needs in Hispanic/Latino Cancer Survivors: Prevalence and Associations With Patient-Provider Communication, Satisfaction With Cancer Care, and Symptom Burden," *Supportive Care in Cancer* 27, no. 4 (2019): 1383–1394, https://doi.org/10.1007/s00520-018-4426-4.

[45] Y. Jie, Y. Wang, J. Chen, et al., "Unmet Supportive Care Needs and Its Relation to Quality of Life Among Adult Acute Leukaemia Patients in China: A Cross-Sectional Study," *Health and Quality of Life Outcomes* 18, no. 1 (2020): 199, https://doi.org/10.1186/s12955-020-01454-5.

[46] E. Kamal Mahmod and K. S. Ahmed, "Unmet Supportive Care Needs of General Cancer," *Teamwork in Healthcare. IntechOpen* (2021): https://doi.org/10.5772/intechopen.96063.

[47] E. Piraux, G. Caty, F. Aboubakar Nana, and G. Reychler, "Effects of Exercise Therapy in Cancer Patients Undergoing Radiotherapy Treatment: A Narrative Review," *SAGE Open Medicine* 8 (2020): 2050312120922657, https://doi.org/10.1177/2050312120922657.

[48] B. M. Gebresillassie, A. A. Ayele, and T. M. Abegaz, "Unmet Supportive Care Needs and Determinants Among Cancer Patients Treated at University of Gondar Specialized Hospital, Northwest Ethiopia: A Prospective Cross-Sectional Study," *Journal of Oncology Pharmacy Practice* 27, no. 8 (2021): 1869–1877, https://doi.org/10.1177/1078155220971035.

[49] T. Afework, A. Wondimagegnehu, A. S. Bogale, E. J. Kantelhardt, and A. Addissie, "Predictors of Unmet Supportive Care Needs of Adult Cancer Patients in Ethiopia," *European Journal of Cancer Care* 31, no. 6 (2022): e13694, https://doi.org/10.1111/ecc.13694.

[50] K. M. Chow, W. K. W. So, K. C. Choi, and C. W. H. Chan, "Sexual Function, Psychosocial Adjustment to Illness, and Quality of Life Among Chinese Gynaecological Cancer Survivors," *Psycho-Oncology* 27, no. 4 (2018): 1257–1263, https://doi.org/10.1002/pon.4663.

[51] E. J. Fong and W. L. Cheah, "Unmet Supportive Care Needs Among Breast Cancer Survivors of Community-Based Support Group in Kuching, Sarawak," *International Journal of Breast Cancer* 2016 (2016): 1–9, https://doi.org/10.1155/2016/7297813.

[52] R. Y. Al-Husban, R. Obeidat, and O. Shamieh, "Unmet Supportive Care Needs of Jordanian Patients With Colorectal Cancer: A Cross-Sectional Survey," *Asia-Pacific Journal of Oncology Nursing* 8, no. 5 (2021): 565–572, https://doi.org/10.4103/apjon.apjon-2110.

[53] A. Al-Omari, N. Al-Rawashdeh, R. Damsees, et al., "Supportive Care Needs Assessment for Cancer Survivors at a Comprehensive Cancer Center in the Middle East: Mending the Gap," *Cancers (Basel)* 14, no. 4 (2022): 1002, https://doi.org/10.3390/cancers14041002.

[54] S. Vahedi, A. Torabipour, A. Takian, et al., "Socioeconomic Determinants of Unmet Need for Outpatient Healthcare Services in Iran: A National Cross-Sectional Study," *BMC Public Health* 21, no. 1 (2021): 457, https://doi.org/10.1186/s12889-021-10477-6.

[55] İ. Ayvat and A. Atli Ozbas, "Is There a Difference in Unmet Supportive Care Needs Between Older and Younger Outpatients Receiving Chemotherapy?" *Journal of Palliative Care* 39, no. 2 (2024): 115–121, https://doi.org/10.1177/08258597211044248.

[56] S. Kanchan and A. Gaidhane, "Social Media Role and Its Impact on Public Health: A Narrative Review," *Cureus* 15, no. 1 (2023): e33737, https://doi.org/10.7759/cureus.33737.

[57] C. P. Akuoko, S. Chambers, and P. Yates, "Supportive Care Needs of Women With Advanced Breast Cancer in Ghana," *European Journal of Oncology Nursing* 58 (2022): 102142, https://doi.org/10.1016/j.ejon.2022.102142.

[58] A. J. Shaikh, N. Dhillion, J. Shah, et al., "Supporting Kenyan Women With Advanced Breast Cancer Through a Network and Assessing Their Needs and Quality of Life," *Supportive Care in Cancer* 30, no. 2 (2022): 1557–1567, https://doi.org/10.1007/s00520-021-06539-5.

[59] M. Subasri, M. Lemonde, J. Mundluru, J. Chang, and R. Koneru, "Assessing the Educational and Supportive Care Needs of Canadian Metastatic Melanoma Patients and Survivors Attending an Outpatient Clinic," *Journal of Patient Experience* 8 (2021): 23743735211033126, https://doi.org/10.1177/23743735211033126.

[60] P. O. Otieno, F. Kiroro, C. Runyenje, and P. Kamau, "Unmet Need for Primary Healthcare and Associated Individual and Household-Level Factors in Kenya: Results From a National Survey," *BMJ Open* 11, no. 5 (2021): e041032, https://doi.org/10.1136/bmjopen-2020-041032.

[61] D. Zavras, A. I. Zavras, I. I. Kyriopoulos, and J. Kyriopoulos, "Economic Crisis, Austerity and Unmet Healthcare Needs:

The Case of Greece," *BMC Health Services Research* 16, no. 1 (2016): 309, https://doi.org/10.1186/s12913-016-1557-5.

[62] N. Tadele, "Evaluation of Quality of Life of Adult Cancer Patients Attending Tikur Anbessa Specialized Referral Hospital, Addis Ababa Ethiopia," *Ethiopian Journal of Health Sciences* 25, no. 1 (2015): 53–62, https://doi.org/10.4314/ejhs.v25i1.8.

[63] W. D. Sulistyarini, "Understanding Unmet Needs and Correlated Factors in Patients With Cancer Undergoing Medical Treatment," (2021), 63–70, https://www.atlantis-press.com/proceedings/sesicnimph-21/125962083Atlantis Press.

[64] R. Costas-Muniz, J. Leng, A. Aragones, et al., "Association of Socioeconomic and Practical Unmet Needs With Self-Reported Nonadherence to Cancer Treatment Appointments in Low-Income Latino and Black Cancer Patients," *Ethnicity and Health* 21, no. 2 (2016): 118–128, https://doi.org/10.1080/13557858.2015.1034658.

[65] R. Adam, R. Nair, L. F. Duncan, et al., "Treatment Burden in Individuals Living With and Beyond Cancer: A Systematic Review of Qualitative Literature," *PLoS One* 18, no. 5 (2023): e0286308, https://doi.org/10.1371/journal.pone.0286308.

[66] T. I. Konstantinidis, M. Spinthouri, A. Ramoutsaki, A. Marnelou, G. Kritsotakis, and O. Govina, "Assessment of Unmet Supportive Care Needs in Haematological Cancer Survivors," *Asian Pacific Journal of Cancer Prevention* 20, no. 5 (2019): 1487–1495, https://doi.org/10.31557/APJCP.2019.20.5.1487.

[67] K. Wang, C. Ma, F. M. Li, et al., "Patient-Reported Supportive Care Needs Among Asian American Cancer Patients," *Supportive Care in Cancer* 30, no. 11 (2022): 9163–9170, https://doi.org/10.1007/s00520-022-07338-2.

[68] Z. Edib, V. Kumarasamy, N. Binti Abdullah, A. M. Rizal, and S. A. Al-Dubai, "Most Prevalent Unmet Supportive Care Needs and Quality of Life of Breast Cancer Patients in a Tertiary Hospital in Malaysia," *Health and Quality of Life Outcomes* 14, no. 1 (2016): 26, https://doi.org/10.1186/s12955-016-0428-4.

[69] D. De Ruysscher, C. Faivre-Finn, K. Nackaerts, et al., "Recommendation for Supportive Care in Patients Receiving Concurrent Chemotherapy and Radiotherapy for Lung Cancer," *Annals of Oncology* 31, no. 1 (2020): 41–49, https://doi.org/10.1016/j.annonc.2019.10.003.

[70] A. Molassiotis, P. Yates, Q. Li, et al., "Mapping Unmet Supportive Care Needs, Quality-of-Life Perceptions and Current Symptoms in Cancer Survivors Across the Asia-Pacific Region: Results From the International STEP Study," *Annals of Oncology* 28, no. 10 (2017): 2552–2558, https://doi.org/10.1093/annonc/mdx350.

[71] J. Armes, M. Crowe, L. Colbourne, et al., "Patients' Supportive Care Needs Beyond the End of Cancer Treatment: A Prospective, Longitudinal Survey," *Journal of Clinical Oncology* 27, no. 36 (2009): 6172–6179, https://doi.org/10.1200/JCO.2009.22.5151.

[72] G. Rayman, A. Akpan, M. Cowie, et al., "Managing Patients With Comorbidities: Future Models of Care," *Future Healthcare Journal* 9, no. 2 (2022): 101–105, https://doi.org/10.7861/fhj.2022-0029.

[73] J. Dine, R. Gordon, Y. Shames, M. K. Kasler, and M. Barton-Burke, "Immune Checkpoint Inhibitors: An Innovation in Immunotherapy for the Treatment and Management of Patients With Cancer," *Asia-Pacific Journal of Oncology Nursing* 4, no. 2 (2017): 127–135, https://doi.org/10.4103/apjon.apjon_4_17.

[74] A. Cochrane, S. Woods, S. Dunne, and P. Gallagher, "Unmet Supportive Care Needs Associated With Quality of Life for People With Lung Cancer: A Systematic Review of the Evidence 2007–2020," *European Journal of Cancer Care* 31, no. 1 (2022): e13525, https://doi.org/10.1111/ecc.13525.

[75] A. Molassiotis, L. Brunton, J. Hodgetts, et al., "Prevalence and Correlates of Unmet Supportive Care Needs in Patients With Resected Invasive Cutaneous Melanoma," *Annals of Oncology* 25, no. 10 (2014): 2052–2058, https://doi.org/10.1093/annonc/mdu366.

[76] M. Norinder, K. Årestedt, S. Lind, et al., "Higher Levels of Unmet Support Needs in Spouses Are Associated With Poorer Quality of Life—A Descriptive Cross-Sectional Study in the Context of Palliative Home Care," *BMC Palliative Care* 20, no. 1 (2021): 132, https://doi.org/10.1186/s12904-021-00829-9.