

RESEARCH ARTICLE

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Factors Associated with Cancer Patients' Perception of Treatment Rights Based on Universal Health Coverage Rights in Buriram Province, Thailand: A Cross-Sectional Study

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Abstract

Background: Treatment rights awareness is crucial for cancer patients as it enables comprehensive access to medical services, from diagnosis to follow-up care. Lack of understanding of these rights may result in delayed treatment and impact quality of life. Moreover, rights awareness helps patients make more informed decisions about their treatment options. This study aimed to investigate factors associated with cancer patients' perception of treatment rights under the Universal Health Coverage scheme in Buriram Province, Thailand. **Methods:** This cross-sectional analytical research involved 522 cancer patients with Universal Health Coverage rights who received services at Nangrong Hospital and its seven network hospitals. Data was collected using questionnaires. The statistical analysis employed descriptive statistics and multiple logistic regression for inferential analysis. **Results:** The study found that the prevalence of high-level rights perception among cancer patients in Buriram Province, Thailand was 78.35% (95% CI: 0.74-0.81). Factors significantly associated with rights perception included: being female (AOR = 3.80, 95%CI: 2.28-6.52, p-value < 0.001), having family members with chronic diseases (AOR = 2.26, 95%CI: 1.20-4.26, p-value = 0.012), having high media literacy health literacy (AOR = 2.10, 95%CI: 1.21-3.63, p-value = 0.008), high perception of resource support (AOR = 3.66, 95%CI: 1.77-6.26, p-value < 0.001), high perception of personnel (AOR = 3.06, 95%CI: 1.61-5.83, p-value = 0.001), high perception of process (AOR = 2.38, 95%CI: 1.42-4.00, p-value = 0.001), and high perception of physical evidence (AOR = 2.22, 95%CI: 1.26-3.92, p-value = 0.006). **Conclusions:** Enhancing patients' awareness of treatment rights will increase access to quality services, reduce healthcare disparities, and promote quality of life for cancer patients in the study area.

Keywords: Cancer patients, Rights perception, Universal Health Coverage

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Introduction

Cancer remains a critical global health challenge with rising incidence and significant disparities in coverage [1]. In Thailand, the increasing cancer burden over 139,000 annual cases has substantially impacted healthcare expenditure [2]. To address these demands, the National Health Security Office implemented the "Cancer Anywhere" policy under the Universal Coverage Scheme (UCS) to enhance accessibility, flexibility in referrals, and palliative care coverage. However, despite policy improvements, systemic barriers such as complex procedures and high patient density persist, potentially hindering effective treatment access [3].

Thailand's Universal Health Coverage scheme, implemented in 2001 under the National Health Security

Act of 2002, aims to ensure equitable access to healthcare services for all eligible citizens. The scheme covers rights to general medical care, treatment for high-cost chronic diseases including cancer, rehabilitation, health promotion, and access to essential medicines and medical devices [4]. According to Becker's Health Belief Model and Bandura's Social Cognitive Theory, patients' perception of treatment rights comprises self-efficacy, perceived benefits, and perceived barriers [5, 6]. In the context of cancer care, these perceptions influence patients' understanding of service entitlements, confidence in accessing care, and awareness of financial and system-related barriers. Previous studies indicate that higher levels of rights perception are associated with improved utilization of healthcare services and more effective policy implementation [7-10].

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Several factors influence patients' perception and utilization of healthcare rights. Socioeconomic status, including income and service accessibility, plays a critical role, as individuals with lower income often face greater challenges in accessing quality healthcare [11]. Geographic barriers, particularly travel distance to healthcare facilities, further affect service utilization [12]. Health literacy is another key determinant, reflecting individuals' capacity to access, evaluate, and apply health information in decision-making [13]. Additionally, prior family experience with chronic illness has been shown to enhance health literacy and facilitate more effective use of treatment rights. Social support from family, friends, and communities also helps patients overcome access barriers and navigate complex healthcare systems [14–16]. Furthermore, healthcare service management factors, including the marketing mix, influence service utilization, with patients tending to prefer facilities perceived as having higher service capacity and quality [17–19].

Buriram Province, located in Northeast Thailand, presents specific challenges in healthcare delivery. Nangrong Hospital serves as a regional cancer network hub for seven districts, managing a high patient volume 1,574 cases in 2023 ranking second only to the provincial hospital [20]. Despite its critical role, recent performance data indicates difficulties in meeting treatment indicators [21]. Currently, there is no research on treatment rights perception among cancer patients in this specific context. This study aims to investigate factors associated with rights perception in Buriram to provide baseline data for developing effective policies and improving service accessibility.

Materials and Methods

Study design and participants

This cross-sectional analytical study employed a questionnaire-based survey for quantitative data collection. The study population consisted of 1,574 cancer patients covered under the Universal Health Coverage scheme who received services at Nangrong Hospital, Buriram Province, Thailand.

The study aimed to examine the associations between socioeconomic status, health literacy, social support, and marketing mix factors and cancer patients' perception of treatment rights under Universal Health Coverage. Inclusion criteria were: (1) patients diagnosed with cancer confirmed by histopathological examination and classified under ICD-10 codes C00–C97; (2) age ≥ 18 years; (3) regular and continuous treatment at Nangrong Hospital; and (4) registration under the Universal Health Coverage scheme within the hospital network. Exclusion criteria included hospitalized patients, pregnant or breastfeeding women, and patients with terminal-stage cancer.

The sample size was determined using Hsieh's formula for sample size estimation in multiple logistic regression analysis. Based on this calculation, a total of 522 participants were required and subsequently recruited for the study, and data collection was successfully completed for all 522 participants, yielding a 100% response rate.

Questionnaire introduction

The questionnaire was developed based on a literature review and comprised five sections: 1) Socioeconomic status (14 items); 2) Health literacy, utilizing the Ministry of Public Health framework [13] (30 items, 4-point scale), categorized into four levels (insufficient to excellent); 3) Social support, adapted from Schaefer [14] (20 items, 5-point scale), classified into low, moderate, and high levels; 4) Marketing mix factors, based on Kotler [17] (35 items, 5-point scale), classified into three levels; and 5) Perception of treatment rights, based on Becker and Bandura [5, 6] (15 items, 5-point scale). For analysis, rights perception scores were dichotomized, with low and moderate levels coded as 0 and high levels coded as 1.

The questionnaire was developed based on an extensive review of relevant literature and established theoretical frameworks. Content validity was evaluated by a panel of five experts using the Index of Item–Objective Congruence (IOC). The results indicated that all 112 items demonstrated perfect congruence with the study objectives, with IOC values equal to 1.00 for every item, representing 100% content validity.

Reliability testing was conducted through a pilot study involving 30 cancer patients with characteristics similar to those of the target population. The results showed excellent internal consistency. Cronbach's alpha coefficients were 0.97 for the health literacy scale, 0.90 for the social support scale, 0.98 for the marketing mix scale, and 0.97 for the treatment rights perception under the Universal Health Coverage scheme among cancer patients at Nang Rong Hospital, Buriram Province. The overall reliability coefficient for the entire questionnaire was 0.98, indicating a very high level of internal consistency.

Statistical methods

Data analysis was performed using STATA version 15 (Khon Kaen University). Descriptive statistics were used to describe socioeconomic characteristics. Factors associated with rights perception were identified using Simple and Multiple Logistic Regression. Variables with a p -value < 0.25 in the univariate analysis were entered into the multivariate model using Backward Elimination [22]. Model fitness was assessed, and final results were presented as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI) at a significance level of $p < 0.05$.

Results

Analysis of rights perception under the Universal Health Coverage scheme among cancer patients in Buriram Province, Thailand revealed that perception of barriers to treatment rights was highest, with 74.33% reporting high-level perception. This was followed by perception of treatment rights benefits at 70.50% showing high-level perception, and self-efficacy in treatment rights perception at 69.54% reporting high-level perception. These findings are detailed in Table 1.

Based on the data analysis of cancer patients' rights perception under the Universal Health Coverage scheme in Buriram Province, Thailand, the results revealed that

Table 1 Number and Percentage of Cancer Patients' Rights Perception under the National Universal Health Coverage Scheme in Buriram Province, Thailand (n=522)

Cancer Patients' Rights Perception under the Universal Health Coverage Scheme in Buriram Province, Thailand	Number	Percentage
Self-efficacy in Treatment Rights Perception		
Low level	6	1.15
Moderate level	153	29.31
High level	363	69.54
Perceived Benefits of Treatment Rights Perception		
Low level	1	0.19
Moderate level	153	29.31
High level	368	70.5
Perceived Barriers to Treatment Rights Perception		
Low level	0	0
Moderate level	134	25.67
High level	388	74.33

a high proportion of cancer patients demonstrated high-level rights perception, accounting for 78.35% (95% CI: 0.74 - 0.81) of the study population. The detailed findings are presented in Table 2.

Multiple logistic regression identified seven significant factors associated with high treatment rights perception. Socioeconomic factors included female gender (AOR=3.86, 95%CI: 2.28-6.52, $p<0.001$) and having family members with chronic illness (AOR=2.26, 95%CI: 1.20-4.26, $p=0.012$) as shown in Table 3. Health literacy and social support factors were high media literacy (AOR=2.10, 95%CI: 1.21-3.63, $p=0.008$) and high resource support (AOR=3.33, 95%CI: 1.77-6.26, $p<0.001$) as presented in Table 4. Significant marketing mix factors comprised personnel (AOR=3.06, 95%CI: 1.61-5.83, $p<0.001$), process (AOR=2.38, 95%CI: 1.42-4.00, $p<0.001$), and physical evidence (AOR=2.22, 95%CI: 1.26-3.92, $p=0.006$) are presented in Table 5. The model demonstrated acceptable discrimination with an Area Under the Curve (AUC) of 77.66%.

Discussion

Perception of treatment rights under the Universal Health Coverage (UHC) scheme reflects cancer patients' understanding of legally guaranteed healthcare entitlements. Such perception plays a critical role in cancer care, as it facilitates timely access to diagnostic services, treatment, follow-up care, and rehabilitation. Inadequate understanding of treatment rights may delay care, contribute to disease progression, and adversely affect long-term quality of life. Moreover, rights perception influences patients' treatment decision-making

by enabling them to evaluate available options and access appropriate services under the UHC scheme. Previous evidence indicates that insufficient understanding of benefit details, despite general awareness of entitlement, limits effective service utilization and equitable access [23–26]. Therefore, clear and comprehensive communication of treatment rights remains essential for improving healthcare access and patient safety.

The present study demonstrated a high prevalence of treatment rights perception among cancer patients (78.35%, 95% CI: 0.74–0.81), suggesting effective dissemination of UHC-related information. High perception of treatment rights is associated with improved access to healthcare services, enhanced treatment adherence, and better long-term outcomes. Patients with adequate understanding of their rights are more likely to engage actively in treatment planning, manage healthcare costs effectively, and reduce financial anxiety. Consistent with previous studies, higher rights perception contributes to reduced healthcare inequalities and improved service utilization efficiency, particularly among vulnerable populations [23–26].

Socioeconomic factors were significantly associated with treatment rights perception. Female patients exhibited higher perception levels than males, which may be explained by gender-specific cancer risks, caregiving roles within families, and broader social networks that facilitate information exchange. Women often accumulate greater experience interacting with healthcare systems and benefit structures, enhancing their understanding of treatment rights. Education and income further influence access to information and comprehension of healthcare benefits. These findings align with previous studies reporting that

Table 2 Level of Rights Perception Under Universal Health Coverage Among Cancer Patients in Buriram Province, Thailand (n=522)

Cancer Patients' Rights Perception under the Universal Health Coverage Scheme in Buriram Province, Thailand	Number	Percentage	95% interval conference
Low - Moderate level	113	21.65	0.18 - 0.25
High level	409	78.35	0.74 - 0.81

Table 3. Presents the Results of Simple and Multiple Logistic Regression Analyses that Investigated the Relationship between Socioeconomic Factors and Cancer Patients' Perception of Their Treatment Rights under Thailand's Universal Health Coverage Program. The study was conducted in Buriram Province, Thailand. (n=522)

Factor	Number	Percentage	Cancer Patients' Rights Perception Low - Moderate (%)	High (%)	Crude OR (95%CI)	p-value	AOR (95%CI)	p-value
Sex						< 0.001		< 0.001
Male	130	24.9	46 (35.38)	84 (64.62)	1		1	
Female	392	75.1	67 (17.09)	325 (82.91)	2.65 (1.70 - 4.14)		3.86 (2.28 - 6.52)	
age						0.3107		
Less than or equal to 30 years	7	1.34	2 (28.57)	5 (71.43)	1			
31 – 40 years old	31	5.94	10 (32.26)	21 (67.74)	0.83 (0.13 - 5.10)			
41 – 50 years old	108	20.69	26 (24.07)	82 (75.93)	1.26 (0.23 - 6.89)			
51 – 60 years old	283	54.21	52 (18.37)	231 (81.63)	1.77 (0.33 - 9.41)			
61 years old and above	93	17.82	23 (24.73)	70 (75.27)	1.21 (0.22 - 6.70)			
(Mean= 53.73, S.D.= 7.84, Minimum = 23, Maximum = 72)								
Average income						0.079		
Less than or equal to 3,000 Baht	352	67.43	69 (19.60)	283 (80.40)	1			
3,001 – 6,000 Baht	91	17.43	28 (30.77)	63 (69.23)	0.54 (0.32 - 0.92)			
6,001 Baht and above	79	17.43	16 (20.25)	63 (79.75)	0.96 (0.52 - 1.76)			
(Mean= 3,367.95, S.D.= 3,150.04, Minimum = 0, Maximum = 23,870)								
Education Level						0.0765		
Didn't study	33	6.32	10 (30.30)	23 (69.70)	1			
Primary Education	416	79.69	83 (19.95)	333 (80.05)	1.74 (0.79 - 3.80)			
Secondary education	58	11.11	13 (22.41)	45 (77.59)	1.50 (0.57 - 3.95)			
Vocational Education/Vocational Education.	8	1.53	5 (62.50)	3 (37.50)	0.26 (0.05 - 1.30)			
Bachelor's Degree	7	1.34	2 (28.57)	5 (71.43)	1.08 (0.17 - 6.57)			
Marital status						0.2894		
Single	57	10.92	14 (24.56)	43 (75.44)	1			
Marry	434	83.14	89 (20.51)	345 (79.49)	1.26 (0.66 - 2.40)			
Widowed/divorced or separated.	31	5.94	10 (32.26)	21 (67.74)	0.68 (0.26 - 1.79)			
Occupation						0.1852		
Not working	71	13.6	9 (12.68)	62 (87.32)	1			
Farmer	370	70.88	87 (23.51)	283 (76.49)	0.47 (0.22 - 0.98)			
General employee	74	14.18	15 (20.27)	59 (79.73)	0.57 (0.23 - 1.40)			
Trade/do business	7	1.34	2 (28.57)	5 (71.43)	0.36 (0.06 - 2.15)			

Table 3. Continued

Factor	Number	Percentage	Cancer Patients' Rights Perception		Crude OR (95%CI)	p-value	AOR (95%CI)	p-value
			Low - Moderate (%)	High (%)				
Cancer patients with health insurance other than Universal Health Coverage								
No	440	84.29	90 (20.45)	350 (79.55)	1	0.135		
Yes	82	15.71	23 (28.05)	59 (71.95)	0.65 (0.38 - 1.12)			
In the past year, patients who received health promotion services or participated in activities not directly related to cancer treatment								
Never	388	74.33	80 (20.62)	308 (79.38)	1	0.3362		
Ever	134	25.67	33 (24.63)	101 (75.37)	0.79 (0.50 - 1.26)			
Patients who received health promotion services or participated in activities not directly related to cancer treatment								
From 1 to 3 times	132	98.51	32 (24.24)	100 (75.76)	1	0.4363		
4 times or more	2	1.49	1 (50.00)	1 (50.00)	0.32 (0.01 - 5.26)			
Transportation costs for traveling to the hospital for treatment per visit								
Less than 500 Baht	304	58.24	64 (21.05)	240 (78.95)	1	0.6971		
500 Baht or more	218	41.76	49 (22.48)	169 (77.52)	0.91 (0.60 - 1.40)			
Out-of-pocket medical expenses per visit								
Less than 30 Baht	425	81.42	90 (21.18)	335 (78.82)	1	0.5876		
30 Baht or more	97	18.58	23 (23.71)	74 (76.29)	0.86 (0.51 - 1.45)			
Family members with chronic illnesses								
No	389	74.52	98 (25.19)	291 (74.81)	1	0.0004	1	0.012
Yes	133	25.48	15 (11.28)	118 (88.72)	2.64 (1.47 - 4.75)		2.26 (1.20 - 4.26)	
The type of local administration in your area of residence								
Subdistrict Administrative Organization	340	65.26	73 (21.47)	267 (78.53)	1	0.6751		
Subdistrict Municipality	37	7.1	6 (16.22)	31 (83.78)	1.41 (0.56 - 3.51)			
Town Municipality	144	27.64	34 (23.61)	110 (76.39)	0.88 (0.55 - 1.40)			
Duration of cancer illness								
Less than or equal to 3 years	443	84.87	97 (21.90)	346 (78.10)	1	0.2222		
4 – 8 years	73	13.98	13 (17.81)	60 (82.19)	1.29 (0.68 - 2.45)			
9 years and older	6	1.15	3 (50.00)	3 (50.00)	0.28 (0.05 - 1.41)			
Stages of cancer								
Phase 1	215	41.19	44 (20.47)	171 (79.53)	1	0.0023		
Phase 2	243	46.55	44 (18.11)	199 (81.89)	1.16 (0.73 - 1.85)			
Phase 3	50	9.58	22 (44.00)	28 (56.00)	0.32 (0.17 - 0.62)			
Phase 4	14	2.68	3 (21.43)	11 (78.57)	0.94 (0.25 - 3.52)			

Table 4. Results of Simple Logistic Regression and Multiple Logistic Regression Analysis Between Health Literacy and Perception of Treatment Rights under Universal Health Coverage Among Cancer Patients in Buriram Province, Thailand (n=522)

Factor	Number	Percentage	Cancer Patients' Rights Perception Low - Moderate (%)	High (%)	Crude OR (95%CI)	p-value	AOR (95%CI)	p-value
Access to health information and healthcare services						0.0005		
Inadequate health literacy - problematic	341	65.33	89 (26.10)	252 (73.90)	1			
Adequate health literacy - excellent	181	34.67	24 (13.26)	157 (86.74)	2.31 (1.41 - 3.78)			
Knowledge and understanding						0.1596		
Inadequate health literacy - problematic	365	69.92	85 (23.29)	280 (76.71)	1			
Adequate health literacy - excellent	157	30.08	28 (17.83)	129 (82.17)	1.39 (0.86 - 2.24)			
Communication Skills						0.0005		
Inadequate health literacy - problematic	352	67.43	91 (25.85)	261 (74.15)	1			
Adequate health literacy - excellent	170	32.57	22 (12.94)	148 (87.06)	2.34 (1.41 - 3.89)			
Decision-making skills						0.1109		
Inadequate health literacy - problematic	371	71.07	87 (23.45)	284 (76.55)	1			
Adequate health literacy - excellent	151	28.93	26 (17.22)	125 (82.78)	1.47 (0.90 - 2.39)			
Self-management						0.0264		
Inadequate health literacy - problematic	348	66.67	85 (24.43)	263 (75.57)	1			
Adequate health literacy - excellent	174	33.33	28 (16.09)	146 (83.91)	1.68 (1.05 - 2.70)			
Media Literacy						0.0011		0.008
Inadequate health literacy - problematic	346	66.28	89 (25.72)	257 (74.28)	1		1	
Adequate health literacy - excellent	176	33.72	24 (13.64)	152 (86.36)	2.19 (1.33 - 3.59)		2.10 (1.21 - 3.63)	

Table 5 Results of Simple Logistic Regression and Multiple Logistic Regression Analysis Between Social Support, Marketing Mix Factors, and Perception of Treatment Rights under Universal Health Coverage Among Cancer Patients in Buriram Province, Thailand (n=522)

Factor	Number	Percentage	Cancer Patients' Rights Perception		Crude OR	p-value	AOR	p-value
			Low - Moderate (%)	High (%)				
Social support, information support.						0.0148		
Low - Moderate level	36	6.9	14 (38.89)	22 (61.11)	1			
High level	486	93.1	99 (20.37)	387 (79.63)	2.48 (1.22 - 5.03)			
Social support, resource support.						<0.001		<0.001
Low - Moderate level	67	12.84	30 (44.78)	37 (55.22)	1		1	
High level	455	87.16	83 (18.24)	372 (81.76)	3.63 (2.12 - 6.21)		3.33 (1.77 - 6.26)	
Social support, friendship support.						0.139		
Low - Moderate level	38	7.28	12 (31.58)	26 (68.42)	1			
High level	484	92.72	101 (20.87)	383 (79.13)	1.75 (0.85 - 3.58)			
Social support, emotional support.						0.5322		
Low - Moderate level	24	4.6	4 (16.67)	20 (83.33)	1			
High level	498	95.4	109 (21.89)	389 (78.11)	0.71 (0.23 - 2.13)			
Market mix factors in services						0.0046		
Low - Moderate level	94	18.01	31 (32.98)	63 (67.02)	1			
High level	428	81.99	82 (19.16)	346 (80.84)	2.07 (1.26 - 3.39)			
Market mix factors in terms of price						0.0225		
Low - Moderate level	119	22.8	35 (29.41)	84 (70.59)	1			
High level	403	77.2	78 (19.35)	325 (80.65)	1.73 (1.09 - 2.76)			
Market Mix Factors Service Channels						<0.001		
Low - Moderate level	110	21.07	46 (41.82)	64 (58.18)	1			
High level	412	78.93	67 (16.26)	345 (83.74)	3.70 (2.33 - 5.86)			
Market Mix Factors Marketing Promotion and Services						<0.001		
Low - Moderate level	124	23.75	44 (35.48)	80 (64.52)	1			
High level	398	76.25	69 (17.34)	329 (82.66)	2.62 (1.67 - 4.11)			
Market Mix Factors Personnel						<0.001		<0.001
Low - Moderate level	66	12.64	30 (45.45)	36 (54.55)	1		1	
High level	456	87.36	83 (18.20)	373 (81.80)	3.74 (2.18 - 6.42)		3.06 (1.61 - 5.83)	
Market mix factors in terms of process						<0.001		<0.001
Low - Moderate level	150	28.74	56 (37.33)	94 (62.67)	1		1	
High level	372	71.26	57 (15.32)	315 (84.68)	3.29 (2.13 - 5.08)		2.38 (1.42 - 4.00)	
Market Mix Factors Physical evidence						<0.001		0.006
Low - Moderate level	109	20.88	43 (39.45)	66 (60.55)	1		1	
High level	413	79.12	70 (16.95)	343 (83.05)	3.19 (2.01 - 5.06)		2.22 (1.26 - 3.92)	

women demonstrate greater awareness of healthcare access barriers and treatment processes, partly due to higher engagement with health services and family care responsibilities [16, 27–30].

Additionally, having family members with chronic illnesses was strongly associated with higher treatment rights perception. Experience in caring for chronically ill relatives increases familiarity with healthcare systems, reimbursement processes, and benefit utilization. Such experience also strengthens social networks, including connections with healthcare providers and patient support groups, which serve as important sources of information and assistance. These factors reduce anxiety related to service access and promote confidence in navigating healthcare systems. Similar findings have been reported in studies demonstrating that caregiving experience enhances health literacy, reduces cost-related treatment avoidance, and improves decision-making regarding service utilization [31–33].

Health literacy, particularly media literacy, was another key determinant of treatment rights perception. In the digital era, the ability to critically evaluate health information from various sources enables patients to distinguish reliable information from misinformation. Patients with higher media literacy are better equipped to understand treatment options, benefit entitlements, and potential risks, thereby supporting informed decision-making. Promoting media literacy is therefore a crucial strategy for strengthening health literacy, enhancing treatment rights perception, and improving cancer care outcomes [28].

Social support, especially resource support, played a significant role in shaping treatment rights perception. Financial assistance, access to medical equipment, coordination support, and information provision help reduce both direct and indirect treatment costs. Patients with strong support networks demonstrated higher confidence in treatment decisions and greater continuity of care. These findings are consistent with previous research indicating that limited social support, particularly in rural areas, contributes to delayed treatment access and unmet palliative care needs [16, 32].

Regarding healthcare service management, marketing mix factors particularly personnel, service processes, and physical evidence were significantly associated with treatment rights perception. High-quality physical environments, clear signage, and accessible educational materials facilitate independent learning and enhance patient confidence. Similarly, efficient service processes and multiple service channels, including telemedicine and telephone consultations, reduce access barriers and support continuous engagement with healthcare services. The integration of digital platforms enhances treatment management and promotes sustained awareness of treatment rights, particularly for patients in remote areas [19, 34, 35].

Medical personnel also play a central role in promoting treatment rights perception through effective communication and patient-centered care. Healthcare providers who offer clear explanations, encourage questions, and demonstrate empathy help build trust,

reduce anxiety, and empower patients to participate actively in decision-making. Consistent with previous studies, high-quality communication and guidance from medical personnel enhance patient satisfaction, understanding of healthcare entitlements, and confidence in service utilization [18, 34].

The findings of this study provide actionable evidence for strengthening the implementation of Universal Health Coverage at the local level amid contemporary challenges such as the rising burden of cancer, population ageing, and digital health transformation. Enhancing cancer patients' perception of treatment rights requires integrated strategies that combine clear and accessible communication, targeted support for vulnerable groups, and the expansion of digital health services such as telemedicine to reduce geographical and socioeconomic barriers. Capacity building for healthcare personnel in health rights communication, along with improvements in service processes, physical environments, and information accessibility, can further promote equitable service utilization. Strengthening collaboration among healthcare providers, local health authorities, community organizations, and social support networks is essential to ensure effective, patient-centered, and sustainable access to treatment rights under Universal Health Coverage.

Limitations

This study has several limitations that should be considered when interpreting the findings. The cross-sectional design limits causal inference between associated factors and cancer patients' perception of treatment rights, as exposures and outcomes were measured simultaneously. The use of self-reported questionnaires may have introduced recall bias and social desirability bias, potentially leading participants to overestimate their levels of rights perception or health literacy. Selection bias cannot be entirely excluded because participants were recruited from a single provincial hospital network, which may limit the representativeness of the sample and the generalizability of the findings to other regions or healthcare settings. Although standardized instruments were used, measurement bias may have occurred due to individual differences in understanding questionnaire items, particularly among participants with lower educational levels. In addition, dichotomization of treatment rights perception into high versus low–moderate levels, while facilitating logistic regression analysis, may have reduced variability and statistical power. Finally, residual confounding may remain, as not all contextual, cultural, or health system–related factors influencing rights perception could be fully captured in the analysis.

Author Contribution Statement

JY, NP carried out the studies, participated in collecting data, and drafted the manuscript. JY, NP, SP, NN performed the statistical analysis and participated in its design. JY, NP, SP, NN, AN participated in acquisition, analysis, or interpretation of data and draft the manuscript. JY, NP, SP, NN, AN and approved the final manuscript.

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Ethics approval

This study was reviewed and approved by the Human Research Ethics Committee of Khon Kaen University, Thailand (HE672176). All procedures were conducted in accordance with the relevant ethical guidelines and standards. Written informed consent was obtained from all participants prior to data collection. Participant confidentiality and privacy were strictly maintained, and all data were analyzed and reported in aggregate form without identifying information.

Data availability

All data analysed during this study are included in this published article.

Competing interests

The authors declare no competing interests.

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