



Quality of life and its correlates in pretreatment patients with locally advanced head and neck cancer: A cross-sectional study in Thailand

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Abstract

Background: Locally advanced head and neck cancer (LAHNC) can significantly impact the quality of life of patients in various ways. However, several factors can contribute to the decrease in quality of life. In Thailand, there is limited knowledge about the factors that affect the quality of life of patients with LAHNC before they receive treatment.

Objective: This study aimed to examine the correlations between Palliative Performance Scale (PPS), family income, body mass index (BMI), age, comorbidity index, and the quality of life of patients with LAHNC before they undergo treatment.

Methods: A correlational cross-sectional study was conducted, and data were collected from 94 pretreatment patients with LAHNC who were admitted to a cancer center in central Thailand using purposive sampling. The data collection instruments included a demographic data form, a medical record form, the Charlson Comorbidity Index (CCI), the Palliative Performance Scale (PPS), and the Functional Assessment of Cancer Therapy-Head and Neck (FACT-H&N) version 4. Descriptive statistics, Pearson's correlation, and Spearman's rank correlation were used to analyze the data.

Results: All study participants completed the questionnaire. The results showed that the overall quality of life of the patients was moderate. PPS, family income, and body mass index were moderately positively correlated with quality of life ($r = 0.494, p < 0.01$; $r = 0.420, p < 0.01$; $r = 0.339, p < 0.01$, respectively). Age had a moderate negative correlation with quality of life ($r = -0.596, p < 0.01$), while comorbidity was not significantly associated with quality of life.

Conclusion: The quality of life of patients with LAHNC before treatment was associated with various factors, including PPS, family income, body mass index, and age. These findings highlight the importance of nutritional support before treatment and the need for social support, especially for older adult patients, to improve their quality of life. The results of this study can be valuable for nurses in developing care programs that enhance the quality of life for patients with LAHNC during the pretreatment phase.

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Keywords

locally advanced head and neck cancer; quality of life; body mass index; head and neck neoplasm; Thailand

Background

Head and neck cancer (HNC) is a prevalent form of cancer worldwide, encompassing malignant lesions in the upper aerodigestive tract, such as the oral cavity, pharynx, and larynx, based on anatomical and topographic criteria (de Araújo Gomes et al., 2020). In 2020, HNC accounted for 931,931 new cases, representing 4.83% of all cancers, and had a high mortality rate of 467,125 cases, which is 4.69% of all cancer-related deaths (Ferlay et al., 2020). In Thailand, oral cavity cancer is the sixth most common cancer among Thai males (5.7 per 100,000 population) and the thirteenth most common cancer among Thai females (3.5 per 100,000

population) (Rojanamat J et al., 2021). Men are significantly more affected by HNC than women, with a male-to-female ratio ranging from 2:1 to 4:1 (Nayak et al., 2019).

The American Joint Committee on Cancer (AJCC), in collaboration with the Union for International Cancer Control (UICC), utilizes the TNM (tumor, node, metastasis) staging system to classify head and neck cancer (HNC) and determine appropriate treatment options (Amin et al., 2017). Staging helps categorize patients into different groups based on cancer prognosis and progression. The stage of the disease plays a crucial role in selecting the most suitable treatment approach, planning treatment strategies, and estimating the prognosis (Zanoni et al., 2019). Generally, early-stage HNC

(stages I and II) is characterized by smaller tumors without lymph node metastasis. Locally advanced head and neck cancer (LAHNC) refers to stages III to IVB, where cancer has invaded nearby structures in the head and neck region and involves multiple lymph nodes, indicating a high risk of recurrence, poor prognosis, and potential progression to stage IVC (advanced distant metastatic disease) (Chow, 2020; Garfield, 2020; Lee et al., 2020; Mañós et al., 2017; Shah & Montero, 2018).

Interestingly, only 40% of HNC patients are diagnosed at the early stages, while the remaining 60% are initially diagnosed with locally advanced cancer (Viani et al., 2021). Notably, patients with early-stage cancer often do not exhibit clear symptoms and may not seek medical attention. Conversely, two out of three patients with locally advanced cancer typically present noticeable symptoms, which can sometimes significantly interfere with their daily activities (Johnson et al., 2020; Lo Nigro et al., 2017). Patients with LAHNC may experience locoregional symptoms such as facial and tongue edema and local necrotic tumors, which can substantially impair their quality of life (Schrijvers & Charlton, 2022).

Locally advanced head and neck cancer (LAHNC) profoundly impacts all aspects of a patient's life due to the complexity and vital functions of the organs in this region, including their role in the respiratory system, prevention of aspiration, and maintenance of functions such as chewing, swallowing, and speaking (Sittitrai, 2019). Consequently, symptoms like fatigue, insomnia, and dysphagia caused by cancer's invasion of these organs significantly affect the physical well-being of patients and their quality of life. Moreover, the psychological domain of patients is greatly influenced by the sudden awareness of their illness, fear of death, abandonment, burdening others, as well as anxiety, depression, and frustration (Chumachote, 2016). These conditions contribute to low self-esteem, decreased functional performance, and diminished quality of life (Suraseraneewong & Sreeprasarn, 2017).

Quality of life (QoL) is a subjective and multidimensional concept that requires assessing various aspects of a patient's life from their own perspective (Cella, 1994). There are different instruments available to assess QoL, depending on the belief perspective, specific areas of focus, or target populations of interest (Pequeno et al., 2020). Notably, for groups with health-related concerns, it is essential to use instruments that assess QoL specifically related to health and its impacts, as they may be more appropriate in capturing the relevant aspects of their well-being.

Previous studies have indicated a decline in the quality of life among patients with locally advanced head and neck cancer (LAHNC) who undergo radiotherapy and concurrent chemoradiotherapy. However, there have been reports of QoL improvement after three to six months of treatment (Chumachote, 2016; Liao et al., 2019; Sharma et al., 2019). Various factors have been identified as potential influences on the QoL of LAHNC patients, including personal factors such as age, family income, and body mass index (BMI); health factors such as disease stage and comorbidity; physical factors such as functional capacity in daily life; and social factors such as social support (Astrup et al., 2017; Bonzanini et al., 2020; Kumar et al., 2019; Liao et al., 2019; Lu et al.,

2019). The relationship between age and QoL in LAHNC patients remains somewhat ambiguous, with studies showing conflicting results. Bonzanini et al. (2020) found that younger patients had lower QoL than elderly patients, while Astrup et al. (2017) reported the opposite. Regarding family income, low income has been associated with lower QoL in many countries (Liao et al., 2019; Lu et al., 2019), although these findings are primarily from studies conducted in developed nations. Therefore, these results may not accurately reflect the factors influencing QoL in LAHNC patients in Thailand, a developing country with unique socioeconomic status and lifestyle considerations. The relationship between BMI and QoL has been explored regarding survival rates (Ackerman et al., 2018; Fattouh et al., 2019), but few studies have investigated its impact on QoL, specifically in LAHNC patients. Comorbidities have shown both negative and positive correlations with QoL (Astrup et al., 2017; Rettig et al., 2016; Sharma et al., 2019), similar to the findings related to age. Lastly, the Palliative Performance Scale (PPS), which assesses the ability to perform daily activities, has been associated with QoL in terminally ill patients, but its impact on patients with locally advanced cancer remains understudied (Ahlam et al., 2019; Puengsook et al., 2019).

Another key motivation for the current study is the limited research on factors related to QoL, specifically in pretreatment patients with locally advanced head and neck cancer (LAHNC). During the pretreatment phase, patients with LAHNC may experience significant pain due to the presence of a large tumor and the absence of medication, which can profoundly impact their QoL. Therefore, this study aims to investigate the QoL of patients with LAHNC during the pretreatment period, recognizing its critical importance in providing comprehensive care to patients in physical, emotional, social, and psychological aspects. The findings from this study will offer valuable insights for nurses and healthcare professionals to enhance clinical care strategies for these patients. Furthermore, the knowledge gained will contribute to developing preventive interventions to improve the QoL of patients with LAHNC.

The present study is grounded in the concept of QoL as developed by Cella (1994) and supported by a comprehensive literature review on factors associated with QoL in individuals with head and neck cancer. QoL encompasses two key components: multidimensionality and subjectivity. Multidimensionality refers to the various aspects of well-being, including physical, functional, emotional, and social domains, that contribute to an individual's overall QoL. Subjectivity emphasizes that the assessment of QoL can only be truly understood from the perspective of the patient themselves. The physical well-being dimension encompasses disease symptoms, treatment side effects, and overall physical health. Functional status relates to an individual's ability to perform activities relevant to their personal needs, goals, and societal roles. Emotional well-being encompasses positive aspects, such as well-being and happiness, and negative aspects, such as distress and psychological challenges. Social well-being encompasses perceptions of social support, engagement in leisure activities, family functioning, intimacy, and sexuality (Cella, 1994).

In the present study, BMI was selected as a variable reflecting physical well-being, PPS reflecting functional status,

and family income reflecting social well-being. Emotional well-being was excluded based on previous studies highlighting its adverse effects (Hortense et al., 2020; Kim et al., 2016). Age and comorbidities were included due to the ambiguous relationship reported in the literature. The study focused on these nonmodifiable factors (age and comorbidities) and modifiable factors (BMI, PPS, and family income) to examine their association with quality of life in patients with locally advanced head and neck cancer.

BMI is widely used as a valuable tool in clinical practice for assessing the nutritional status of cancer patients, serving as an indicator of malnutrition (Kumar, 2012). In the context of head and neck cancer, BMI has been identified as a predictive factor for malnutrition at the time of diagnosis (Arribas et al., 2013). Furthermore, previous research has indicated that patients classified as being at high risk of malnutrition experience persistent and significantly impaired quality of life across various domains (Silva et al., 2019).

The Palliative Performance Scale (PPS) score has been recognized as being closely associated with quality of life (QoL) due to its correlation with the capacity to engage in daily activities, which in turn impacts QoL (Puengsook et al., 2019). A previous study observed that the PPS score had a significant relationship with QoL, particularly in terms of functional well-being (Ahlam et al., 2019).

As the costs of medical care continue to rise, the diagnosis, treatment, and follow-up care of cancer, including LAHNC, can lead to increased financial burdens for patients and their families. Family income is often affected by the additional expenses associated with medical care. Furthermore, LAHNC patients may experience a loss of income due to their inability to work or reduced work capacity (Lu et al., 2019). These factors contribute to the financial challenges faced by LAHNC patients and their families.

Regarding age and comorbidities, previous studies have consistently shown that older adults tend to have lower QoL in terms of physical function compared to younger individuals (Astrup et al., 2017; Sharma et al., 2019). This could be attributed to the fact that older patients may experience more symptoms or side effects and have poorer overall health conditions (Astrup et al., 2017). Additionally, research indicates that two or more comorbidities are moderately associated with a negative impact on QoL, particularly in the physical domain rather than the emotional or mental health domains (Terrell et al., 2004).

However, despite numerous studies that have explored the relationship between QoL and various factors, there is a lack of research specifically focusing on the factors related to the QoL of patients with LAHNC during the pretreatment stage. Therefore, the primary objective of the present study is to examine the QoL of patients with LAHNC in the pretreatment period and explore the relationships among PPS, family income, BMI, age, comorbidity index, and their impact on QoL. By investigating these factors, this study aims to provide essential data that can inform preventive care strategies. The assessment of patients during the pretreatment stage is crucial as it forms the basis for all subsequent treatments, allowing for QoL planning and ensuring high-quality patient care throughout the entire treatment process, including end-of-life care.

Methods

Study Design

This cross-sectional study employed a descriptive correlational research design. The writing of this report adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) Statement Checklist (Von Elm et al., 2007).

Sample/Participants

The sample size was calculated using the G*power program version 3.1.9.7 (Faul et al., 2009). The desired level of statistical significance was set at $p < 0.05$, with a power of 0.80 and a medium effect size of 0.30, as suggested by Cohen (1992). A medium effect size indicates a perceptible average size of observed effects. Based on the G*power calculation, the required sample size was determined to be 84 patients. To account for potential sample loss, an additional 10% of the sample size was added (Naing et al., 2006). Therefore, the final sample size for this study included 94 patients.

The participants for this study were selected using purposive sampling based on specific inclusion criteria as follows: 1) age of 18 years or older, 2) diagnosed with locally advanced head and neck cancer, 3) pathology confirmed as squamous cell carcinoma, 4) in the pretreatment stage without undergoing radiotherapy, chemotherapy, or concurrent chemoradiotherapy, 5) proficient in writing the Thai language, and 6) without cognitive impairment (assessed by a Thai Mental State Examination score of 23 or higher). The participants who were experiencing drowsiness or were unconscious were excluded from the study. The participants were recruited from the 4th Public Health Region in Thailand, specifically from a cancer center. The sample group consisted of patients with LAHNC who were admitted for treatment.

Instruments

Five instruments were utilized for data collection in this study:

1) Demographic Data Form: This questionnaire included multiple-choice and short-answer questions to gather information on participants' gender, age, weight, height, BMI, marital status, religion, educational levels, occupation, income, health benefit scheme, and family role.

2) Medical Record Form: This section captured details from participants' medical records, including the diagnosis, cancer stage, devices used, and duration of illness.

3) Comorbidities Assessment: The Charlson Comorbidity Index (Charlson et al., 1987) was employed to assess comorbidities. The index was translated into Thai by Utriyaprasit (2001), and permission was obtained from the instrument owner for its use. Nineteen comorbidities were evaluated, and scores ranged from 0 to 37. Total scores were classified into four levels: 0 = no comorbidity, 1–2 = mild comorbidity, 3–4 = moderate comorbidity, and ≥ 5 = severe comorbidity. The reliability, measured by the intraclass correlation coefficient, was 1.00, determined from testing 30 patients with LAHNC.

4) Palliative Performance Scale (PPS): The Thai PPS Adult Suandok, translated from the PPS version 2 of Victoria Hospice Society, Canada, by the Nursing Department of Maharaj Nakorn Chiang Mai Hospital (Chewaskulyong et al., 2012), was used to assess patients' PPS. Permission was

obtained from the instrument owner for its use. This assessment consisted of five patient features: (1) ambulation, (2) activity and extent of disease, (3) self-care, (4) intake, and (5) consciousness level. Based on these features, patients were categorized into three stages: 70–100% = stable stage, 40–60% = transitional stage, and 0–30% = terminal stage. The intraclass correlation coefficient reliability, determined from testing 30 patients with LAHNC, was 0.93.

5) Patient Quality of Life (QoL) Assessment: The Functional Assessment of Cancer Therapy-Head and Neck (FACT-H&N) version 4 was used to assess patients' quality of life. The questionnaire was translated from English to Thai using the Multilingual Translations Methodology (D'Antonio et al., 1996), and permission was obtained from the instrument owner for its use. The assessment inquired about patients' QoL in the past seven days using multiple-choice questions comprising 39 items covering five domains: Physical well-being (PWB) (seven items), Social/family well-being (SWB) (seven items), Emotional well-being (EWB) (six items), Functional well-being (FWB) (seven items), and Additional concerns or Head and Neck subscale (HNCS) (12 items). Participants were given an opportunity to select from five response options that represented a spectrum of rating levels: 0 = none, 1 = very little, 2 = sometimes, 3 = moderately high, and 4 = extremely high. The assessment included both positive and negative statements, with scores for negative statements reversed. Two items related to smoking and drinking alcohol (items 8 and 9) were excluded from the total score calculation. Hence, a total of 37 items were used to compute scores ranging from 0 to 148. Higher scores indicated higher QoL, while lower scores indicated lower QoL (Silveira et al., 2010). Internal consistency reliability, assessed among 30 LAHNC patients, yielded Cronbach's alpha coefficients of 0.94 for PWB, 0.78 for SWB, 0.92 for EWB, 0.94 for FWB, 0.84 for HNCS, and 0.97 for total QoL.

Data Collection

Data collection was conducted by a research assistant who was a nurse working in the study setting and possessed experience in data collection. The research assistant underwent training on data collection procedures using the study's questionnaire. Data were collected over the period from August 2021 to October 2022. Prior to completing the questionnaire, each participant was requested to provide informed consent, indicating their willingness to participate. The questionnaire was administered in a quiet room, and the completion time averaged around 30 minutes. The study also included participants who faced challenges in reading or independently completing the questionnaire. The research assistant read the questions and possible answer choices aloud for these individuals, allowing the participants to provide their responses independently.

Data Analysis

Data analysis was conducted using SPSS for Windows version 26. Descriptive statistics were utilized to analyze the demographic data and assess the quality of life measures. Pearson correlation was employed to examine the relationships between the PPS, family income, BMI, and QoL variables. Spearman's rank correlation coefficient was used to assess the correlation between age and comorbidity variables.

Ethical Considerations

This study obtained ethical approval from the Human Research Ethics Committee of Thammasat University, Thailand (EC approval number: 029/2021) and the IRB Committee of Maha Vajiralongkorn Thanyaburi Hospital (EC approval number: 2021-12). Informed consent was obtained from all study participants prior to their involvement in the study. This process ensured that the participants were thoroughly briefed on the study's objectives, methodologies, potential risks, anticipated benefits, and their rights, empowering them to make an informed decision regarding their participation.

Results

Demographic Data of the Participants

Out of the 94 study participants, the majority were male (93.60%), followed the Buddhist religion (100.00%), served as the head of the family (83.00%), utilized the universal coverage scheme as their medical benefits scheme (72.30%), were married (71.30%), had an elementary education (63.80%), and were either employees or masons (37.20%). The average age of the participants was 56.05 years old (SD = 8.01). Regarding physical characteristics, the average weight of the entire participants was 55.52 kg (SD = 10.12), and the average BMI was 20.33 kg/m² (SD = 3.35). The majority of participants had a normal BMI (55.32%), while the second largest group had an underweight BMI (26.60%). The average family income was 9,790.43 THB (SD = 7,419.24). The proportions of the participants with different PPS scores were: PPS 70-100% for the stable stage (96.80%), PPS 40-60% for the transitional stage (3.20%), and no PPS 0-30% for the terminal stage. Detailed results of the demographic data can be found in [Table 1](#).

Medical Data of the Participants

[Table 2](#) shows that the majority of participants in this study were diagnosed with nasopharyngeal carcinoma (21.30%), followed by tongue cancer (14.90%) and supraglottic cancer (12.80%). In terms of disease stage, most participants were classified as stage IVA (51.10%), followed by stage IVB (26.60%) and stage III (22.30%). Regarding the duration of illness, the majority of participants had been diagnosed within the past 1-6 months (61.70%). In addition, a large proportion of participants had no comorbidity (84.00%). However, many participants relied on nasogastric or gastrostomy tubes for nutritional support (58.51%), and a considerable portion also had tracheostomy tubes (43.62%).

Quality of Life of Patients with LAHNC

The findings of this study revealed that the QoL among patients with LAHNC was moderate, with an average score of 70.17 (SD = 17.46). When examining the different aspects of QoL, a moderate level was observed across the five domains: additional concerns (Mean = 15.47, SD = 5.80), physical well-being (Mean = 15.34, SD = 4.47), emotional well-being (Mean = 14.04, SD = 4.01), social/family well-being (Mean = 13.98, SD = 3.22), and functional well-being (Mean = 11.34, SD = 4.39), as presented in [Table 3](#).

Table 1 Demographic data of the participants (*N* = 94)

Variables	<i>n</i>	%	Mean (SD) Range
Gender			
Male	88	93.60	
Female	6	6.40	
Age			
			56.05 (8.01) 22-74
Weight (kg)			
			55.52 (10.12) 35.60-99.40
Height (cm)			
			165.12 (5.31) 154-183
BMI (kg/m²)			
			20.33 (3.35) 13.91-37.18
BMI 18.5 – 22.90 kg/m ² (normal)	52	55.32	
BMI <18.5 kg/m ² (underweight)	25	26.60	
BMI 23 – 24.90 kg/m ² (overweight 1)	11	11.70	
BMI 25 – 29.90 kg/m ² (overweight 2)	5	5.32	
BMI 30 kg/m ² (Obese)	1	1.06	
Marital Status			
Married	67	71.30	
Divorced/Separated	13	13.80	
Single	7	7.40	
Widowed	7	7.40	
Religion			
Buddhist	94	100.00	
Education			
Elementary	60	63.80	
High school	23	24.50	
Vocational/High vocational certificate	5	5.30	
Bachelor	5	5.30	
Master/PhD	1	1.10	
Occupation			
Employee/Mason	35	37.20	
Company employee	24	25.50	
Farmer	19	20.20	
Jobless/Unemployed	7	7.40	
Merchant/Self-employed	4	4.30	
Other (Monk)	3	3.20	
Official/Government employee	2	2.10	
Family Income (Baht)			
			9,790.43 (7,419.24)
<1,000	3	3.19	600-30,000
1,000-5,000	39	41.49	
5,001-10,000	23	24.47	
10,001-15,000	14	14.89	
15,001-20,000	8	8.51	
>20,000	7	7.45	
Medical Benefit Scheme			
Universal coverage scheme	68	72.30	
Social security scheme	25	26.60	
Government officer scheme	1	1.10	
Family Role			
Head of the family	78	83.00	
Family member	16	17.00	
Palliative Performance Scale PPS (%)			
80	44	46.80	
60	28	29.80	
70	19	20.20	
50	3	3.20	

Table 2 Medical data of the participants (*N* = 94)

Variables	<i>n</i>	%
Diagnosis		
Nasopharyngeal carcinoma	20	21.30
Tongue cancer	14	14.90
Supraglottic cancer	12	12.80
Glottic cancer	7	7.40
Tonsil cancer	7	7.40
Pyiform cancer	6	6.40
Floor of mouth cancer	6	6.40
Oropharynx cancer	5	5.30
Larynx cancer	4	4.30
Hypopharynx cancer	3	3.10
Gum cancer	3	3.20
Soft palate cancer	3	3.20
Hard palate cancer	2	2.10
Alveolar ridge cancer	2	2.10
Stage		
Stage III	21	22.30
Stage IVA	48	51.10
Stage IVB	25	26.60
Devices		
Nasogastric tubes or gastrostomy tubes	55	58.51
Tracheostomy tubes	41	43.62
Duration of illness (month/year)		
1–6 months	58	61.70
>6 months – 1 year	28	29.70
>1 year	8	8.50
Comorbidity		
0 (no comorbidity)	79	84.00
1-2 (mild comorbidity)	14	14.90
3-4 (moderate comorbidity)	1	1.10
≥5 (severe comorbidity)	0	0.00

Table 3 QoL of patients with LAHNC (*N* = 94)

Variables	Range	Min-Max	Mean	SD	Level
Physical well-being	0–28	5–24	15.34	4.47	Moderate
Social/family well-being	0–28	5–19	13.98	3.22	Moderate
Emotional well-being	0–24	7–23	14.04	4.01	Moderate
Functional well-being	0–28	2–23	11.34	4.39	Moderate
Additional concerns	0–40	3–28	15.47	5.80	Moderate
Total score	0–148	37–109	70.17	17.46	Moderate

Table 4 First five questions with the lowest QoL scores (*N* = 94)

Variables	Range	Min-Max	Mean	SD	Level
"I can eat solid foods"	0–4	0–2	0.47	0.62	Low
"I can swallow naturally and easily"	0–4	0–2	0.51	0.73	Low
"I am able to eat the foods that I like"	0–4	0–3	0.57	0.73	Low
"I am able to eat as much food as I want"	0–4	0–3	0.71	0.89	Low
"I feel close to my friends"	0–4	0–3	1.14	0.85	Low

Among the 37 questions of QoL, the five items with the lowest scores were as follows: 1) "I can eat solid foods," with an average score of 0.47 (SD = 0.62); 2) "I can swallow naturally and easily," which received an average score of 0.51 (SD = 0.73); 3) "I am able to eat the foods that I like," which yielded an average score of 0.57 (SD = 0.73); 4) "I am able to eat as much food as I want," with an average score of 0.71 (SD = 0.89); and (5) "I feel close to my friends," which obtained an average score of 1.14 (SD = 0.85). These results are presented in [Table 4](#).

Table 5 Correlation among age, BMI, family income, PPS, comorbidity, and QoL ($N = 94$)

Variables	Age	BMI	Family Income	PPS	Comorbidity	QoL
Age ^{rs}	1					
BMI ^r	-0.402**	1				
Family Income ^r	-0.485**	0.385**	1			
PPS ^r	-0.477**	0.281**	0.339**	1		
Comorbidity ^{rs}	0.025	0.248*	0.034	0.038	1	
QoL ^r	-0.596**	0.339**	0.420**	0.494**	-0.039	1

* $p < 0.05$, ** $p < 0.01$ | $r =$ Pearson's correlation coefficient | $r_s =$ Spearman's rank correlation coefficient

Discussion

The QoL among patients with LAHNC was found to be moderate across all five aspects. The majority of participants were in disease stage IVA (51.10%), which is consistent with previous studies that reported a high proportion of patients in stages III and IV ([Bonzanini et al., 2020](#); [Chow, 2020](#); [Nayak et al., 2019](#)). Additionally, a significant number of patients in our study were dependent on nasogastric tubes or gastrostomy tubes (58.51%) and tracheostomy tubes (43.62%), indicating the impact of HNC on vital organs such as the respiratory and digestive systems. This further supports the notion that HNC substantially affects QoL across all aspects ([Sharma et al., 2019](#); [Sittitirai, 2019](#)).

Four out of the five questions with the lowest scores in the sample group were related to additional concerns, specifically regarding (1) "I can eat solid foods," (2) "I can swallow naturally and easily," (3) "I am able to eat the foods that I like," and (4) "I am able to eat as much food as I want." These findings indicate that patients experienced difficulties with chewing and swallowing, leading to reduced food intake. Additionally, one question from the social/family well-being aspect, "I feel close to my friends," received a low score, likely due to changes in self-image caused by the condition. The noticeable impact on eating and social aspects is significant because it affects highly visible areas of the body and can disrupt daily routines and activities such as speech, breathing, eating, and drinking.

Patients with HNC often experience compromised nutritional status even before the start of treatment due to the tumors' effects on chewing, swallowing, and alterations in taste. This finding is consistent with [Karimi et al. \(2019\)](#) and [Aparajita et al. \(2022\)](#), which reported that QoL at the pretreatment stage was moderate and had a higher average compared to the post-treatment phase.

The current study revealed a significant moderate positive correlation between the PPS and QoL. This finding suggests that the PPS score is associated with QoL, as the ability to engage in daily activities contributes to overall well-being. When individuals experience a decline in their ability to be active due to illness or severe symptoms, their QoL may also decrease, as they may feel too uncomfortable to engage in

Correlations among Age, BMI, Family Income, PPS, Comorbidity, and QoL

[Table 5](#) displays that there were significant moderate positive correlations between PPS, family income, and BMI with QoL ($r = 0.494$, $p < 0.01$; $r = 0.420$, $p < 0.01$; $r = 0.339$, $p < 0.01$, respectively). On the other hand, age showed a significant moderate negative correlation with QoL ($r = -0.596$, $p < 0.01$), while comorbidity was found to be unrelated to QoL.

activities. This aligns with the findings of [Puenngsook et al. \(2019\)](#), who reported a significant correlation between PPS scores and functional well-being in QoL. Patients with 40-60% PPS scores or 0-30% exhibited a lower QoL than those with 70-100% (0.110 times, $p < 0.001$, 95% CI 0.042-0.289). These results indicate that patients with lower levels of self-sufficiency also tend to have a diminished QoL. Moreover, [Ahlam et al. \(2019\)](#) conducted a study on the QoL of patients with advanced-stage cancer and found a significant correlation between the Karnofsky Performance Status and the physical functional scale, encompassing fatigue and loss of appetite. This further supports the notion that a patient's performance status or functional capacity is closely related to various aspects of QoL.

Family income demonstrated a significantly moderate positive association with QoL. The participants had relatively low average family income (9,790.43 THB, SD = 7,419.24), with the majority falling within the income range of 1,000-5,000 THB (41.49%). Most participants were either employees or masons who experienced job loss upon being diagnosed with cancer. This circumstance contributed to the low-income category, which was further compounded by participants who could not work or faced difficulties covering various expenses. As a result, financial challenges emerged, potentially impacting the QoL of these patients. Consistent with these findings, [Lu et al. \(2019\)](#) highlighted a significant correlation between low QoL in physical, emotional, and functional aspects and financial difficulties. Similarly, [Chen et al. \(2018\)](#) reported that objective and subjective financial burdens were associated with health-related QoL among lung cancer patients. The present study examined the correlation between the objective/subjective financial burden ratio and QoL, revealing that patients experiencing significant financial problems had notably lower QoL in the emotional aspect and overall QoL. These findings underscore the influence of financial concerns on different dimensions of QoL.

BMI positively correlated significantly with QoL. The majority of the sample group had a normal BMI (55.32%), while a considerable proportion had a low BMI (underweight) (26.60%). However, it is essential to note that having a higher BMI does not necessarily indicate adequate nutrition or the

absence of malnourishment among obese patients (Ackerman et al., 2018). In the present study, the first four lowest QoL scores were associated with eating difficulties, explaining the lower BMI observed. Patients with LAHNC encounter various challenges related to feeding due to the proximity of the cancers to critical organs involved in eating. This proximity can lead to swallowing and chewing difficulties, resulting in pain and discomfort during food consumption. Consequently, patients consume less food and experience weight loss. Weight loss serves as a robust predictor of survival rates in HNC patients (Ackerman et al., 2018). Supporting these findings, Fattouh et al. (2019) investigated the relationship between obesity/sarcopenia and survival rates in 441 pretreatment HNC patients. Their study revealed that 55% of the pretreatment patients were obese and had a higher survival rate (hazard ratio = 0.4, 95% CI: 0.3-0.6).

Age negatively correlated with QoL. This finding can be attributed to several factors that impact the QoL of older patients compared to younger individuals. Older patients often carry a higher burden of comorbidities, experience impaired nutritional status, and have a decreased performance status compared to their younger counterparts (Maggiore et al., 2017). These factors can negatively impact the physical and emotional domains of QoL. Additionally, older patients may face challenges in social functioning and experience changes in their family roles, transitioning from being the head of the family to becoming the individual in need of care. These changes, coupled with potential decreases in income, can lead to heightened stress, discomfort, and depression among older adults, ultimately reducing their overall QoL (Chobtamsakul, 2018). Similar findings were reported by Astrup et al. (2017), who observed a negative correlation between increasing age, comorbidity burden, mental illness, and QoL in the physical well-being domain among HNC patients undergoing chemoradiotherapy. Sharma et al. (2019) also highlighted that patients over the age of 50 exhibited lower QoL in terms of physical well-being, as elderly patients may have greater difficulty in coping with and recovering from cancer. Conversely, Bonzanini et al. (2020) noted that patients over the age of 62 demonstrated better QoL, suggesting that younger patients may experience higher levels of stress and despair, potentially leading to increased rates of depression. Furthermore, in patients with colorectal cancer, age indirectly influenced QoL through its impact on body image disturbance and depressive symptoms (Bunkong et al., 2023).

Comorbidity did not demonstrate a significant correlation with QoL. The majority of the sample group had no comorbidities, with only 16.00% exhibiting mild to moderate comorbidities (scoring 1-3), and no severe comorbidities were reported. It appears that the participants could manage their symptoms and address their comorbidities effectively, as there was no observed impact on QoL among patients with LAHNC. This finding aligns with a previous study (Sharma et al., 2019), that also found no correlation between comorbidities and QoL among patients with HNC. However, it is worth noting that Astrup et al. (2017) reported a negative correlation between age, comorbidity burden, emotional problems, and QoL among HNC patients undergoing chemoradiotherapy.

Limitations of the Study

The findings may have been influenced by the COVID-19 pandemic, as the participants experienced isolation from their family and close friends. This isolation might impact the assessment of QoL, particularly in the domains of social/family well-being and emotional well-being. It is essential to consider the potential effects of the pandemic on the participants' overall QoL. Additionally, it is noted that the study primarily included male participants (93.60%), which limits the availability of information regarding the QoL of female patients with LAHNC. This gender imbalance highlights the need for further research to explore the unique experiences faced by female patients in relation to their QoL.

Furthermore, it is crucial to exercise caution when generalizing the study conclusions to patients with LAHNC in other regions or healthcare settings. The data were collected from a single cancer center located in Central Thailand. Therefore, the findings may not fully represent the diverse experiences and contexts of patients with LAHNC across the country. Future studies conducted in different settings and populations would be valuable for a more comprehensive understanding of QoL among patients with LAHNC.

Implications for Nursing Practice

The study results revealed significant relationships between various individual and environmental factors, including age, PPS, BMI, family income, and QoL among patients with LAHNC. These results hold valuable implications for nurses and other healthcare professionals in developing effective interventions to enhance patients' QoL. By addressing these factors, particularly nutrition status, functional status, and social support prior to treatment, healthcare professionals can improve patients' overall well-being. In nursing practice, it is essential for nurses to regularly recognize and evaluate patients' BMI on a weekly basis. This allows for the timely monitoring and enhancement of nutritional status.

Additionally, consistent assessment of the patient's functional status is vital to identify potential disturbances such as fatigue and loss of appetite that may impede their ability to carry out daily activities. Nurses can intervene promptly to optimize patients' functional well-being by closely monitoring these aspects. Furthermore, nurses should collaborate with social workers to address financial problems, particularly among the older adult population, who often face greater physical challenges. By actively addressing financial concerns, nurses can alleviate stress and enhance patients' QoL. Overall, the findings emphasize the importance of comprehensive nursing care that encompasses monitoring and managing factors such as nutrition status, functional status, and social support. By implementing these strategies, nurses and healthcare professionals can make meaningful contributions to improving the QoL of patients with LAHNC.

Conclusion

The study findings indicated that the sample group of patients with LAHNC had a moderate QoL. The lowest QoL scores were in the additional concerns and social/family well-being domains. The study identified specific factors, including age, BMI, PPS, and family income, associated with a decrease in QoL. Based on these findings, nurses can develop strategic

interventions to improve the QoL of patients with LAHNC. For instance, providing nutritional support prior to treatment is crucial in enhancing QoL by addressing the impact of the disease on patients' physical functioning. Enhancing social support systems can also improve QoL, particularly among older adults who may face greater challenges.

Declaration of Conflicting Interest

The authors declared no conflict of interest in this study.

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Authors' Contributions

SP was responsible for the research conception and design, data collection, analysis, interpretation of results, and drafting of the manuscript. YM reviewed the results and provided revisions to the draft. TS and KW made significant contributions to the conception and design of the study. All authors have reviewed and approved the final version of the manuscript.

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Data Availability

The corresponding author can provide the datasets used for analysis upon reasonable request.

Declaration of Use of AI in Scientific Writing

Nothing to declare.

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