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Correlation of COOP/WONCA charts with the Spanish version of the Nottingham Health Profile for oncology patients and the Beck Inventories: Clinical implications

by Esther Soler Climent, Matilde Miguel Manzanera, Vanesa Pavia Miralles, and Aitor Serrano Saez

ABSTRACT

Background: The rising prevalence of cancer presents a major public health challenge in Spain and globally. In 2023, the Spanish Society of Medical Oncology (SEOM) projected 279,260 new cancer cases in Spain, with colon, breast, lung, prostate, and bladder cancers being predominant. Cancer remains a leading cause of death worldwide, with 18.1 million new cases and 9.5 million deaths in 2018, expected to rise significantly by 2040. Given these alarming statistics, there is an urgent need to address the complex needs of cancer patients. This study assesses the psychometric properties of the COOP/WONCA charts and Nottingham Health Profile (NHP) in oncology patients, evaluating their correlation with the Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-2).

Methods: An analytical observational cohort study included oncology patients from the General Hospital of Elche, Spain, undergoing chemotherapy and/or radiotherapy. The COOP/WONCA charts, NHP, BAI, and BDI-2 assessed health-related quality of life (HRQoL) and psychological states at baseline, 15 days after treatment initiation, monthly during treatment, and at the end of treatment. Correlations were analyzed using Pearson and Spearman coefficients.

Results: Among 75 patients (36% men, 64% women), significant correlations were observed between COOP/WONCA charts and NHP dimensions, including energy ($\rho = 0.560$), pain ($\rho = 0.520$), physical movement ($\rho = 0.718$), emotional reaction ($\rho = 0.662$), sleep ($\rho = 0.486$), social isolation ($\rho = 0.674$), and functionality ($\rho = 0.778$), all $p < 0.001$. HRQoL improvements were significantly correlated with reductions in anxiety and depression.

Conclusion: The COOP/WONCA charts are effective tools for assessing HRQoL in oncology patients, correlating strongly with the NHP and psychological states measured by BAI and BDI-2. Future research should explore their applicability in diverse clinical settings and the development of personalized interventions integrating HRQoL assessments.

Keywords: cancer, health-related quality of life, HRQoL, COOP/WONCA charts, Nottingham Health Profile, NHP, Beck Anxiety and Depression Inventories, oncology, patient-centred care

INTRODUCTION

The increasing prevalence of cancer in Spain and globally poses a significant challenge to public health. The Spanish Society of Medical Oncology (SEOM; 2022) anticipated 279,260 new cancer cases in Spain in 2023, predominantly colon, breast, lung, prostate, and bladder cancers. Globally, cancer remains a leading cause of death, with 18.1 million new cases and 9.5 million deaths in 2018. These numbers are expected to rise to 29.5 million cases and 16.4 million deaths by 2040 (National Cancer Institute, 2022). Given these alarming statistics, there is an urgent need to address the complex needs of cancer patients. It is essential not only to focus on tumour eradication but also to consider the long-term consequences that impact patients' quality of life.

Recent research emphasizes the importance of assessing the impact of new therapeutic proposals on patients' health status within oncology, highlighting the role of complementary therapies in improving quality of life. For instance, kinesiology taping has shown effectiveness in alleviating pain in cancer patients (Amarowicz & Warzecha, 2020), and the integration of physiotherapy, especially in palliative care, is crucial for easing suffering and enhancing mobility (Canto et al., 2021). Moreover, the positive effects of physical activity and physiotherapy on patients' psychological state underscore the necessity of holistic strategies that address both physical and

AUTHOR NOTES



Esther Soler Climent, RN, BSN, MN, Area of Research and Innovation in Care, Department of Health, Elche General Hospital, Elche, Spain; FISABIO, Valencia, Spain



Matilde Miguel Manzanera, RN, Medical Oncology Service, Department of Health, Elche General-Hospital, Elche, Spain; FISABIO, Valencia, Spain



Vanesa Pavia Miralles, RN, Medical Oncology Service, Department of Health, Elche General Hospital, Elche, Spain; FISABIO, Valencia, Spain



Aitor Serrano Saez, RN, Radiation Therapy Service, Department of Health, Elche General Hospital, Elche, Spain; FISABIO, Valencia, Spain

Corresponding author: soler_estcli@gva.es

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emotional aspects of cancer care (Żyżniewska-Banaszak et al., 2021). Such approaches correlate directly with overall survival in patients with advanced breast cancer treated with ribociclib and endocrine therapy, showcasing quality of life as both a crucial treatment component and a vital long-term outcome predictor (Fasching et al., 2021). The study by Ramasubbu et al. (2021) further explores the quality of life and factors affecting it in adult cancer patients undergoing chemotherapy, providing valuable insights into the multifaceted nature of patient experiences during treatment.

Against this backdrop of rising prevalence, the significance of understanding patient needs for care planning purposes becomes increasingly apparent. Research conducted by Krishna et al. (2020) emphasizes the importance of providing support and continuity of care for palliative care patients at home, evidencing the need for more comprehensive and personalized care. Concurrent research by Oertelt-Prigione et al. (2021) uncovers how sex differences in symptoms and functioning, in more than 5,000 cancer survivors, can influence quality of life, suggesting the adaptation of treatment strategies to accommodate these variances. Parás-Bravo et al. (2020) further explore the perspective of sex in cancer patients and its relation to anxiety, highlighting the psychological dimension of patient care. These studies collectively underscore the multifaceted needs of cancer patients, both those undergoing treatment and those in palliative care, emphasizing the necessity for approaches that comprehensively consider physical, emotional, and psychosocial well-being.

The enduring physical and psychosocial effects in cancer survivors highlight the need for comprehensive support that addresses both medical and psychosocial needs (Schmidt et al., 2022; Ferro et al., 2014). Additionally, the impact of aesthetic and body image concerns on health-related quality of life (HRQoL), influenced by treatment side effects, calls for attention to patients' self-esteem and emotional well-being, as shown in the work by Valverde et al. (2014). This underscores the significance of socio-aesthetic aspects in oncology, where interventions, such as those described by Saghatchian et al. (2018), can enhance patient well-being by addressing the impact of beauty and well-being sounds.

Accurate, specific, and culturally appropriate HRQoL assessment tools are essential, with their periodic evaluation critical for patient-centred care, clinical research, and health policy development. The COOP/WONCA Charts and the NHP offer a comprehensive HRQoL view in cancer patients, providing essential data for clinical practice improvement and the well-being of oncological patients. The international validation of the EORTC QLQ-ANL27 by Sodergren et al. (2023) emphasizes the need for reliable HRQoL assessment tools specific to cancer types, enhancing the precision and relevance of patient-reported outcomes in clinical settings. Hence, the evaluation of the correlation of these two instruments with validated tools is an important step for their use in practice.

This study design, based on analytical cohort observation without a control group, was carefully selected to comprehensively evaluate the psychometric properties of the assessment

instruments used, including the COOP/WONCA Charts, the Nottingham Health Profile (NHP), and the Beck Anxiety and Depression Inventories (BAI and BDI-2) in oncology patients. This approach allows for a longitudinal and detailed evaluation of health-related quality of life (HRQoL) and the psychological state of patients during cancer treatment. The choice of this design is justified by its ability to capture individual and temporal variations in health perception and emotional well-being, providing robust and relevant data to validate the effectiveness of the instruments employed. Additionally, the diversity in cancer types and treatments received by the study population enriches the findings, allowing for a broader and more applicable understanding of oncology patients' experiences in different clinical contexts.

METHODS

This study aims to investigate the correlation between the Spanish versions of the COOP/WONCA charts and the NHP in oncology patients, specifically evaluating how these tools, in conjunction with the BAI and BDI-2, can enhance understanding of emotional well-being and the effectiveness of treatments for emotional well-being in this patient population. Reliable and valid tools can significantly aid in understanding emotional well-being and assist in measuring the effectiveness of treatments in this patient population.

The study was structured as an analytical observation of cohorts without a control group, with the purpose of analyzing the psychometric properties of the assessment tools used to evaluate the quality of life and psychological state of cancer patients. The study population included oncology patients from the Health Service of the General Hospital of Elche (Spain) who were undergoing chemotherapy and/or radiotherapy. This population was selected due to its diversity in types of cancer, covering the most common ones, such as breast, lung, prostate, head and neck, gynecological, and gastrointestinal cancers.

Instrument descriptions

The COOP/WONCA Charts were used to measure patients' functional health status across multiple domains, including physical fitness, daily activities, social activities, emotional well-being, and overall quality of life. These charts provide a quick and reliable assessment of patient-reported health outcomes, facilitating the evaluation of functional impairments and their impact on daily life. Research has shown that the COOP/WONCA Charts are acceptable, with reasonable distributions of scores and evidence of construct validity, moderate levels of reliability, and sensitivity to change (Kinnersley et al., 1994).

The NHP also was used to assess perceived health problems and their impact on daily life activities. The NHP includes sections on physical mobility, pain, sleep, social isolation, emotional reactions, and energy levels, providing a comprehensive view of the patients' health status and quality of life. Research indicates that the NHP is a feasible tool for assessing HRQoL in various populations, including those with chronic illnesses and older adults (Jenkinson & Fitzpatrick, 1990)

In addition to these tools, the BAI and BDI-2 were administered to evaluate the psychological aspects of anxiety and depression, respectively. The BAI consists of 21 items, each describing a common symptom of anxiety, and is designed to distinguish anxiety from depression. The BDI-2, also comprising 21 items, assesses the presence and severity of depressive symptoms. Both inventories are widely recognized for their reliability and validity in clinical and research settings, making them suitable for assessing the mental health of cancer patients. Research has shown that the BAI and BDI-2 are effective in distinguishing anxiety and depressive symptoms in various clinical populations, including patients with major depression and anxiety disorders (Hewitt & Norton, 1993).

Recruitment and informed consent

The recruitment of participants was carried out during the nursing consultation in the clinical oncology and radiotherapy service of the General University Hospital of Elche (Spain) during their first visit. All potential participants, aged between 18 and 85 years, were informed by the principal investigator or the collaborating researchers about the nature and objectives of the study. Participants were required to sign informed consent forms to indicate their understanding and willingness to participate. Inclusion criteria necessitated that participants be scheduled to commence treatment in the clinical oncology and/or radiotherapy service at the hospital. Exclusion criteria included the inability to sign the informed consent form, as well as any barriers to comprehension, reading, and signing the consent form or completing the questionnaires (e.g., lack of proficiency in Spanish). Two individuals declined to participate; these individuals proceeded to the usual clinical practice without the administration of multiple assessment tools.

Administration and sequence of questionnaires

For the assessment of the quality of life and the psychological state of the participants, the COOP/WONCA Charts and the NHP were administered at specific times: baseline visit (first day of treatment), 15 days after the start of treatment, monthly visits during the visit to the Oncological Aesthetics Cabinet, and at the end of treatment (20–30 days after finishing treatment). Similarly, the BAI and the Beck Depression Inventory-II (BDI-2) were completed during the baseline visit, at monthly visits, and at the end of treatment.

The questionnaires were self-administered by the patients, except in those cases where, due to difficulties in reading (e.g., because of headache, fatigue, dryness of the conjunctiva, or other discomforts), the tools were administered by personnel specifically trained for this task. To minimize the potential bias derived from fatigue caused by reading and concentration, the order of filling out the questionnaires was alternated according to the visit number. The methodological approach ensures the rigorous and systematic collection of data, allowing a comprehensive assessment of the quality of life and emotional state of oncology patients, thus providing a solid basis for the clinical implications derived from the study.

Analysis

A rigorous evaluation of the convergent-discriminant validity of the COOP/WONCA Charts, the NHP, the BAI, and the BDI-2 was carried out using univariate descriptive statistics, bivariate analyses, and multiple linear regression models. The analysis was performed using the R statistical software, setting a statistical significance threshold at $p < 0.05$.

To conduct a comprehensive statistical analysis of the correlations between the COOP/WONCA Charts, the NHP, the BAI, and the BDI-2, Pearson and Spearman correlation analyses were performed. These tests were employed to determine the strength and significance of the linear and rank-order relationships between the various dimensions of the mentioned tools across multiple follow-up visits. Pearson correlation coefficients were used to assess the linear relationship between scores, while Spearman coefficients were applied to examine rank-order relationships. Additionally, associated p -values were calculated to evaluate the statistical significance of these correlations. This analysis enabled the identification of significant and consistent correlations between the physical and psychological dimensions measured by these tools, providing a solid foundation for evaluating the utility of the COOP/WONCA Charts as a substitute for the NHP in clinical settings.

RESULTS

Demographic and clinical characteristics

The study sample consisted of 75 patients, of which 36% were men (27 patients) and 64% were women (48 patients). Thirteen individuals (17.3%) had oncological histories. Almost half of the patients (46.7%) received a combination of chemotherapy and radiotherapy, 20% received chemotherapy alone, and 33.3% were treated with radiotherapy only. Additionally, 41.9% of the patients received immunotherapy or hormonal treatment as a complement, and 48.6% were receiving psychiatric treatment.

Inferential analysis results

The inferential analysis focused on the statistical correlations and changes observed throughout the study, highlighting relationships between various health dimensions and psychological states. Significant correlations were found across all three measurement points between the NHP and COOP/WONCA Charts, indicating a strong positive relationship between the instruments in assessing patients' health perceptions (Table 1). The Pearson correlation coefficients showed significant values for energy ($\rho = 0.560$, $p < 0.001$), pain ($\rho = 0.520$, $p < 0.001$), physical movement ($\rho = 0.718$, $p < 0.001$), emotional reaction ($\rho = 0.662$, $p < 0.001$), sleep ($\rho = 0.486$, $p < 0.001$), social isolation ($\rho = 0.674$, $p < 0.001$), and functionality ($\rho = 0.778$, $p < 0.001$).

Further analysis linking the NHP and COOP/WONCA charts with the Beck Inventories for Anxiety and Depression revealed clinically relevant findings. Improvements in perceived health showed significant correlations with reductions in anxiety and depression levels, with statistical significance ($p < 0.001$) and effect sizes ranging from moderate to large

Table 1

Correlations Between the Nottingham Health Profile (NHP) Dimensions and COOP/WONCA Chart Scores Across Different Visits for Oncology Patients Receiving Treatment

Nottingham Health Profile (NHP)	COOP/WONCA Chart							
	Basal	V.1	Final	Mean	Basal p-value	V.1 p-value	Final p-value	Mean p-value
Energy	0.449	0.527	0.527	0.56	<.001	<.001	<.001	<.001
Pain	0.313	0.668	0.448	0.52	0.006	<.001	<.001	<.001
Physical Movement	0.576	0.544	0.575	0.718	<.001	<.001	<.001	<.001
Emotional Reaction	0.604	0.56	0.469	0.662	<.001	<.001	<.001	<.001
Sleep	0.532	0.359	0.423	0.486	<.001	0.002	<.001	<.001
Social Isolation	0.505	0.556	0.472	0.674	<.001	<.001	<.001	<.001
Functionality	0.605	0.652	0.757	0.778	<.001	<.001	<.001	<.001

($d = 0.5\text{--}0.8$; Table 2, Table 3). Specifically, there was a significant negative correlation between improvements in the perception of energy and pain reduction with decreases in anxiety and depression scores ($r = -0.76, p < 0.001$). Similar negative correlations were observed for physical movement and functionality ($r = -0.72, p < 0.001$), and for emotional reaction, sleep, and social isolation ($r = -0.69, p < 0.001$).

Detailed correlation analysis of COOP/WONCA, NHP, BAI, and BDI-2 across different visits

The analysis aimed to evaluate the correlations between the COOP/WONCA Charts, the NHP, the BAI, and the BDI-2 across multiple visits. The primary objective was to determine the relationship between these instruments and assess whether COOP/WONCA Charts can effectively substitute the NHP in clinical settings.

At the baseline visit, significant correlations were observed between the COOP/WONCA Charts and various dimensions of the NHP. Specifically, there were moderate to strong correlations in the dimensions of energy (Spearman’s $\rho = 0.449, p < 0.001$), pain ($\rho = 0.313, p = 0.006$), physical movement ($\rho = 0.576, p < 0.001$), emotional reaction ($\rho = 0.604, p < 0.001$), sleep ($\rho = 0.532, p < 0.001$), social isolation ($\rho = 0.505, p < 0.001$), and functionality ($\rho = 0.605, p < 0.001$; Table 1). These correlations indicate a strong relationship between COOP/WONCA Charts and NHP in assessing HRQoL from the outset.

During the first follow-up visit, the correlations between COOP/WONCA Charts and NHP dimensions remained robust. For instance, energy showed a correlation of $\rho = 0.527 (p < 0.001)$, pain $\rho = 0.668 (p < 0.001)$, and physical movement $\rho = 0.544 (p < 0.001)$. Emotional reaction correlated with $\rho = 0.560 (p < 0.001)$, sleep with $\rho = 0.359 (p = 0.002)$, social isolation with $\rho = 0.556 (p < 0.001)$, and functionality with $\rho = 0.652 (p < 0.001)$. Furthermore, significant correlations were found with BAI and BDI-2, highlighting the psychological impact of physical health changes. Anxiety correlated with $\rho = 0.648 (p < 0.001)$ and depression with $\rho = 0.738 (p < 0.001$; Table 3).

At the final visit, the correlations between COOP/WONCA and NHP dimensions remained particularly strong. The energy dimension showed a correlation of $\rho = 0.527 (p < 0.001)$, pain $\rho = 0.448 (p < 0.001)$, physical movement $\rho = 0.575 (p < 0.001)$, emotional reaction $\rho = 0.469 (p < 0.001)$, sleep $\rho = 0.423 (p < 0.001)$, social isolation $\rho = 0.472 (p < 0.001)$, and functionality $\rho = 0.757 (p < 0.001)$. Correlations with BAI and BDI-2 were also significant, with anxiety showing $\rho = 0.478 (p < 0.001)$ and depression $\rho = 0.688 (p < 0.001$; Table 4).

Across all visits, the average correlations between COOP/WONCA and NHP dimensions were consistent and strong, demonstrating the reliability of COOP/WONCA Charts in measuring HRQoL. The overall correlation for energy was $\rho = 0.560 (p < 0.001)$, pain $\rho = 0.520 (p < 0.001)$, physical movement $\rho = 0.718 (p < 0.001)$, emotional reaction $\rho = 0.662 (p < 0.001)$, sleep $\rho = 0.486 (p < 0.001)$, social isolation $\rho = 0.674 (p < 0.001)$, and functionality $\rho = 0.778 (p < 0.001$; Table 5). Psychological assessments also showed strong correlations, with anxiety at $\rho = 0.661 (p < 0.001)$ and depression at $\rho = 0.789 (p < 0.001)$.

DISCUSSION

This study explored the correlations between the COOP/WONCA Charts, the NHP, and the BAI and BDI-2 in Spanish-speaking oncology patients. The results demonstrated that the COOP/WONCA Charts are highly effective in assessing HRQoL in oncology patients, showing strong correlations with the NHP across multiple dimensions, including energy, physical movement, emotional reaction, social isolation, and functionality. These findings are consistent with previous studies validating the utility of the COOP/WONCA Charts in various populations. Jónsson et al. (2020) validated the Icelandic version of the COOP/WONCA Charts in primary care, finding high reliability and validity in assessing HRQoL. Similarly, de Azevedo-Marques et al. (2019) demonstrated the applicability of these charts in general practice, highlighting their ability to accurately evaluate multiple dimensions of patient well-being.

Table 2

BASAL Correlation Matrix

		COOP/ WONCA Basal	NHP Energy Basal	NHP Pain Basal	NHP Physical Movement Basal	NHP Emotional Reaction Basal	NHP Sleep Basal	NHP Social Isolation Basal	NHP Functionality Basal	BAI Anxiety Basal	BDI-2 Depression Basal
COOP/ WONCA BASAL	Spearman's rho	–									
	p-value	–									
Energy Basal	Spearman's rho	0.449	–								
	p-value	<.001	–								
Pain Basal	Spearman's rho	0.313	0.237	–							
	p-value	0.006	0.041	–							
Physical Movement Basal	Spearman's rho	0.576	0.565	0.442	–						
	p-value	<.001	<.001	<.001	–						
Emotional Reaction Basal	Spearman's rho	0.604	0.346	0.195	0.387	–					
	p-value	<.001	0.002	0.093	<.001	–					
Sleep Basal	Spearman's rho	0.532	0.315	0.282	0.383	0.601	–				
	p-value	<.001	0.006	0.014	<.001	<.001	–				
Social Isolation Basal	Spearman's rho	0.505	0.364	-0.039	0.319	0.577	0.493	–			
	p-value	<.001	0.001	0.738	0.005	<.001	<.001	–			
Functionality Basal	Spearman's rho	0.605	0.434	0.076	0.337	0.490	0.413	0.528	–		
	p-value	<.001	<.001	0.516	0.003	<.001	<.001	<.001	–		
Anxiety Basal	Spearman's rho	0.549	0.387	0.285	0.394	0.631	0.519	0.394	0.360	–	
	p-value	<.001	<.001	0.013	<.001	<.001	<.001	<.001	0.001	–	
Depression Basal	Spearman's rho	0.676	0.424	0.214	0.526	0.619	0.693	0.588	0.598	0.715	–
	p-value	<.001	<.001	0.065	<.001	<.001	<.001	<.001	<.001	<.001	–

In this study, the significant correlations between the COOP/WONCA Charts and the NHP remained consistent throughout the follow-up visits, with Spearman's correlation coefficients ranging from 0.449 to 0.718 ($p < 0.001$). These strong correlations indicate that the COOP/WONCA Charts can effectively assess HRQoL in oncology patients, similarly to the NHP. Specifically, the dimensions of energy, physical movement, emotional reaction, social isolation, and functionality showed significant correlations, suggesting that both instruments can be used complementarily to provide a more comprehensive evaluation of HRQoL.

Additionally, the study revealed a significant negative correlation between improvements in perceived health dimensions through the COOP/WONCA Charts and reductions in anxiety and depression levels measured by the Beck Inventories. These findings underscore the interconnection between physical and emotional well-being in oncology patients. Shim et al. (2019) investigated anxiety and depression in advanced cancer patients, emphasizing the importance of considering emotional well-being in oncology treatment. Pisu et al. (2017) also demonstrated that psychosocial interventions can significantly influence the quality of life in cancer patients, supporting the need for a holistic approach that includes both physical and emotional evaluations.

In this study, a significant negative correlation was observed between improvements in energy perception and

pain reduction with decreases in anxiety and depression scores ($\rho = -0.76, p < 0.001$). Similarly, significant negative correlations were found for physical movement and functionality ($\rho = -0.72, p < 0.001$), and for emotional reaction, sleep, and social isolation ($\rho = -0.69, p < 0.001$). These correlations indicate that the COOP/WONCA charts can be a valuable tool for monitoring both the physical and emotional well-being of oncology patients, allowing clinicians to quickly identify patients who may need additional support in managing anxiety and depression.

Integrating our observations with similar studies underscores the relevance of using tools like the COOP/WONCA Charts and the NHP in clinical practice for a comprehensive assessment of HRQoL and emotional well-being in oncology patients. The longitudinal analysis by Park et al. (2020) emphasizes the importance of early assessment of anxiety and depression to prevent declines in quality of life following a cancer diagnosis. The ability of these instruments to capture significant changes in quality of life, along with their correlation with anxiety and depression indicators, offers a valuable opportunity to inform clinical decision-making and personalize treatment and support for patients.

The study conducted by Wang et al. (2019) highlights the need to provide additional emotional support to caregivers of cancer patients, indicating that participation in clinical trials does not necessarily reduce anxiety or depression in these

Table 3

VISIT 1 Correlation Matrix

		COOP/ WONCA V.1	NHP Energy V.1	NHP Pain V.1	NHP Physical Movement V.1	NHP Emotional Reaction V.1	NHP Sleep V.1	NHP Social Isolation V.1	NHP Functionality V.1	BAI Anxiety V.1	BDI-2 Depression V.1
COOP/ WONCA V.1	Spearman's rho	—									
	p-value	—									
Energy V.1	Spearman's rho	0.527	—								
	p-value	<.001	—								
Pain V.1	Spearman's rho	0.668	0.384	—							
	p-value	<.001	<.001	—							
Physical Movement V.1	Spearman's rho	0.544	0.621	0.512	—						
	p-value	<.001	<.001	<.001	—						
Emotional Reaction V.1	Spearman's rho	0.560	0.586	0.265	0.517	—					
	p-value	<.001	<.001	0.024	<.001	—					
Sleep V.1	Spearman's rho	0.359	0.535	0.197	0.362	0.586	—				
	p-value	0.002	<.001	0.098	0.002	<.001	—				
Social Isolation V.1	Spearman's rho	0.556	0.501	0.363	0.375	0.456	0.526	—			
	p-value	<.001	<.001	0.002	0.001	<.001	<.001	—			
Functionality V.1	Spearman's rho	0.652	0.312	0.364	0.421	0.462	0.257	0.411	—		
	p-value	<.001	0.008	0.002	<.001	<.001	0.030	<.001	—		
Anxiety V.1	Spearman's rho	0.648	0.571	0.423	0.493	0.609	0.555	0.516	0.521	—	
	p-value	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	—
Depression V.1	Spearman's rho	0.738	0.613	0.396	0.567	0.716	0.578	0.547	0.672	0.733	—
	p-value	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

individuals. These findings, along with the results of this study showing a strong positive correlation between improvements in perceived health dimensions and reductions in anxiety and depression levels, emphasize the value of interventions targeted at both patients and caregivers to improve emotional well-being and quality of life.

The findings of the study reflect a complex dynamic in the HRQoL of oncology patients, showing significant variations throughout treatment and recovery. These results align with recent research highlighting the multifactorial influence of oncology treatment on patients' HRQoL. The initial decline in HRQoL post-treatment, observed in this study and supported by Mierzynska et al. (2019), underscores the immediate impact of medical interventions on the physical and emotional well-being of patients. This trend reflects not only the physical consequences of treatment but also the psychological burden of facing a cancer diagnosis. However, this study also indicates a gradual recovery in HRQoL during the follow-up period, suggesting notable adaptation and resilience among patients. This finding is supported by Wang et al. (2020), who identified improvements in HRQoL over two years post-treatment in breast cancer survivors, associating these improvements with specific clinical and sociodemographic characteristics. Marzorati et al. (2020) also highlighted the importance of considering sociodemographic and clinical variables when assessing post-treatment HRQoL in lung cancer patients, emphasizing that quality of life recovery is significantly

influenced by the type of surgery, perioperative complications, and the patient's pre-surgical health status.

Study limitations

This study provides valuable insights into the correlations between the COOP/WONCA Charts, the NHP, and the BAI and BDI-2 in Spanish-speaking oncology patients. However, several limitations should be considered. The self-administration of questionnaires, although mitigated to some extent, could have been influenced by patient fatigue or visual difficulties, potentially affecting the quality of responses. Additionally, the inclusion of a broad spectrum of cancer types, while enriching the data, introduces complexity in interpreting the results due to the diverse experiences of disease and treatment across different oncological diagnoses.

Future implications

Given the limitations in this study, we propose several directions for future research. Studies incorporating larger and more diverse samples would help validate and expand upon our findings, offering insights across various geographical and cultural contexts. Including control groups in study designs could provide a clearer understanding of causal relationships among quality of life, anxiety, depression, and oncological treatment. Assessing the applicability of the COOP/WONCA Charts in different clinical settings, particularly where there are constraints on time and resources, is crucial to ascertain their effectiveness as quick assessment tools. Finally, given

Table 4*FINAL VISIT Correlation Matrix*

		COOP/ WONCA V.Final	NHP Energy V.Final	NHP Pain V.Final	NHP Physical Movement V.Final	NHP Emotional Reaction V.Final	NHP Sleep V.Final	NHP Social Isolation V.Final	NHP Functionality V.Final	BAI Anxiety V.Final	BDI-2 Depression V.Final
COOP/ WONCA V.Final	Spearman's rho	—									
	p-value	—									
Energy V.Final	Spearman's rho	0.527	—								
	p-value	<.001	—								
Pain V.Final	Spearman's rho	0.448	0.521	—							
	p-value	<.001	<.001	—							
Physical Movement V.Final	Spearman's rho	0.575	0.547	0.430	—						
	p-value	<.001	<.001	<.001	—						
Emotional Reaction V.Final	Spearman's rho	0.469	0.448	0.296	0.359	—					
	p-value	<.001	<.001	0.015	0.003	—					
Sleep V.Final	Spearman's rho	0.423	0.394	0.289	0.407	0.477	—				
	p-value	<.001	<.001	0.018	<.001	<.001	—				
Social Isolation V.Final	Spearman's rho	0.472	0.421	0.216	0.272	0.453	0.326	—			
	p-value	<.001	<.001	0.079	0.026	<.001	0.007	—			
Functionality V.Final	Spearman's rho	0.757	0.427	0.275	0.379	0.436	0.382	0.408	—		
	p-value	<.001	<.001	0.024	0.002	<.001	0.001	<.001	—		
Anxiety V.Final	Spearman's rho	0.478	0.479	0.330	0.394	0.653	0.521	0.434	0.558	—	
	p-value	<.001	<.001	0.006	<.001	<.001	<.001	<.001	<.001	—	
Depression V.1	Spearman's rho	0.688	0.518	0.362	0.424	0.586	0.587	0.477	0.693	0.745	—
	p-value	<.001	<.001	0.003	<.001	<.001	<.001	<.001	<.001	<.001	—

Table 5*Average Scores of Questionnaires at Each Clinical Visit for Participating Patients*

Average	Media COOP/ WONCA	NHP Energy	NHP Pain	NHP Physical Movement	NHP Emotional Reaction	NHP Sleep	NHP Social Isolation	NHP Functionality	BAI Anxiety	BDI-2 Depression
Basal	12.5	14.1	10.3	10.01	12.33	23.5	7.24	17.3	8.24	6.83
Visit 1	13	22.4	11.94	10.6	11.11	19.7	5.86	19.8	5.89	6.57
Visit 2	14.3	31.4	12.5	15.61	12.21	23.2	6.63	33.3	7.5	8.96
Visit 3	13.4	15.2	5.26	15.47	9.08	23	1.68	29.3	5.9	7.52
Visit 4	13.4	11.6	3.66	6.52	11.07	15.1	7	26.8	6.38	8.56
Visit 5	13.7	12.4	4.82	6.58	10.93	20.3	1.94	21.4	6	7.3
Final Visit	12.3	17	8.23	9.78	10.19	19.1	5.58	20	5.52	6.84

Note. Interpretation of scores for each instrument

COOP/WONCA Scores = 30 Max. ---> POOR HEALTH; NHP subvalues = 100 Max. ---> POOR HEALTH

BAI 00–21 – Very low anxiety. 22–35 – Moderate anxiety. More than 36 – Severe anxiety.

BDI 0–13 minimal depression; 14–19 mild depression; 20–28 moderate depression, 29–63 severe depression

the significant correlations identified, future research should explore the development and evaluation of personalized interventions that integrate assessments of HRQoL and emotional well-being, recognizing these assessments as integral components of comprehensive oncological care.

CONCLUSION

This study provided an in-depth exploration of the correlations between the COOP/WONCA Charts, the NHP, and the BAI and BDI-2 in Spanish-speaking oncology patients. The findings demonstrated that the COOP/WONCA charts are highly effective in assessing HRQoL in oncology patients,

showing strong correlations with the NHP across multiple dimensions, including energy, physical movement, emotional reaction, social isolation, and functionality. Additionally, this study highlighted significant negative correlations between improvements in perceived health dimensions measured by the COOP/WONCA Charts and reductions in anxiety and depression levels measured by the Beck Inventories. This underscores the interconnectedness of physical and emotional well-being in oncology patients, emphasizing the importance of a holistic approach in their care.

The integration of COOP/WONCA Charts and NHP in clinical practice offers a comprehensive assessment tool for HRQoL and emotional well-being in oncology patients. These instruments' ability to capture significant changes in quality of life and their correlation with anxiety and depression indicators provide valuable insights for clinical decision-making, helping to personalize treatment and support for patients and ultimately improving their overall care.

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