

Quality of Life of Cancer Patients from the Perspective of Health Economics

Guan Jingyue

Hefei No.8 heigh school, Hefei, Anhui, China

Abstract: Advances in medical technology have significantly improved the survival rate of cancer patients in China. However, their long-term quality of survival continues to be affected by various factors, including physiological, psychological, and society. From the perspective of health economics, this approach helps to assess the key factors influencing long-term survival quality and explore ways to improve it. It provides a theoretical basis and practical model for enhancing long-term survival quality, holding promising applications and significant social value.

Keywords: Cancer Patients; Long-Term Quality of Survival; Health Economics

1. Introduction

The long-term quality of life (QoL) of cancer patients remains a pressing concern, extending far beyond the scope of disease control alone. Advances in diagnostic techniques and therapeutic modalities have significantly improved survival rates over the past decades; however, these achievements have also brought new challenges, including treatment-related physiological side effects, psychological distress, and socioeconomic burdens. For many patients, prolonged survival is accompanied by a diminished capacity to maintain daily functioning, emotional well-being, and social participation. Consequently, improving QoL has emerged as a critical endpoint in oncology, complementing traditional measures such as overall survival (OS).

Within this context, health economics provides a valuable framework for understanding and addressing the complex, multidimensional determinants of QoL. By integrating physiological, psychological, social, and economic perspectives, health economics emphasizes not only the optimal allocation of healthcare resources but also the broader influences of lifestyle, environment, and social

support systems on patient outcomes. Identifying the key factors that impact QoL and developing cost-effective, sustainable interventions are essential to ensuring that survival gains translate into meaningful improvements in daily life.

Therefore, collaboration among medical institutions, families, and society is crucial. A comprehensive approach—grounded in evidence-based research and guided by health economic principles—can help alleviate financial toxicity, reduce anxiety and depression, and empower patients to actively engage in their treatment journey. Such strategies are not only vital for enhancing individual well-being but also for promoting the sustainable development of healthcare systems.

2. Current Attention to the Quality of Life in Cancer Patients

In recent years, with the growing emphasis on the Patient-Centered treatment concept, patients' own perceptions and quality of life (QoL) have been receiving increasing attention. Jimmy Holland, a pioneer in psycho-oncology, once wrote in *The Human Side of Cancer: Medicine is not merely various experiments confined in test tubes, nor is it merely drugs contained in bottles. Improving patients' quality of life and relieving the psychological distress of patients and their families (in addition to treatment itself) are equally important.*

A meta-epidemiological analysis conducted by the MD Anderson Cancer Center of the University of Texas [1] showed that 32% of randomized controlled trials (RCTs, n=257) demonstrated superiority in either overall survival (OS) or overall QoL, but only 6% of RCTs (n=48) demonstrated superiority in both. Therefore, although the majority of RCTs are interpreted as positive results, the actual benefits in OS or QoL are uncommon, and simultaneous improvement in both is even

rarer. Surrogate endpoints (such as tumor shrinkage or progression-free survival) have gradually become the primary endpoints of phase III clinical trials due to their shorter

study duration and lower cost. However, these indicators often have weak correlations with what patients truly care about—OS and QoL.

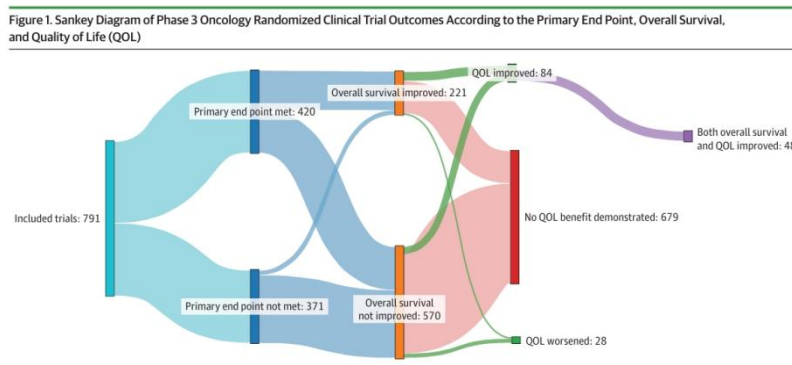


Figure 1. Sankey Diagram of Phase III Oncology Randomized Clinical Trial Outcomes with Overall Survival (OS) and Quality of Life (QoL) as Primary Endpoints

3. Factors Affecting the Quality of Life in Cancer Patients

Malignant tumors are among the leading causes of death in China. Mortality surveillance data indicate that cancer accounts for nearly one-quarter of all deaths among Chinese residents. With the shift in medical models and health concepts, the 5-year survival rate of cancer patients has significantly improved. However, various physiological and psychological problems resulting from treatment can affect patients' quality of life. Therefore, the goal of cancer treatment is no longer limited to prolonging survival time, but increasingly emphasizes the assessment and improvement of health utility values in patients with lung cancer.

Studies have shown that economic burden has a negative impact on cancer patients. As the number of dependents and annual household expenditures increase, the economic burden borne by lung cancer patients also rises, accompanied by a decline in health utility values, suggesting a significant effect of financial burden on patients' health-related quality of life (HRQoL) [2]. In 2022, the per capita disposable income of residents in Henan

Province was RMB 28,222, while the average medical expenses for lung cancer patients in China reached RMB 50,000-70,000 -equivalent to one to two times the national per capita disposable income. More than half of lung cancer patients' households had annual expenditures exceeding RMB 80,000, with problems most pronounced in the anxiety or depression. This indicates that lung cancer imposes a heavy financial burden on patients and their families, while also posing serious threats to patients' psychological well-being.

This phenomenon is not only due to high medical expenses but also reflects patients' inability to access sufficient psychological support and rehabilitation services for economic reasons, further affecting their physical and mental health, subsequent treatment, and overall quality of life [3]. Therefore, healthcare systems and social support networks should provide comprehensive medical, psychological, and social assistance to reduce patients' financial burdens, develop strategies to alleviate anxiety and improve depressive symptoms, and help patients build confidence in coping with disease and treatment—ultimately improving prognosis and quality of life.

Variable	β (95%CI)	S.E.	t	P	Variable	β (95%CI)	S.E.	t	P
Number of dependents (reference: <2)					Number of dependents (reference: <2)				
≥ 2	-0.112(-0.194--0.030)	0.042	-2.690	0.007	≥ 2	-0.111(-0.194--0.029)	0.042	-2.670	0.008
Annual household expenditure per capita in 2022 (CNY) (reference: <80 000)					Annual household expenditure per capita in 2022 (CNY) (reference: <80 000)				
80 000-120 000	-0.014(-0.109-0.082)	0.048	-0.280	0.777	80 000-120 000	-0.014(-0.110-0.081)	0.049	-0.300	0.766
>120 000	-0.093(-0.180--0.007)	0.044	-2.130	0.034	>120 000	-0.094(-0.180--0.007)	0.044	-2.130	0.034
Stage (reference: I-III)					Metastasis (reference: No)				
IV	-0.081(-0.160--0.001)	0.040	-2.000	0.046	Yes	-0.068(-0.147-0.010)	0.040	-1.710	0.088
AIC	-20.784				AIC	-19.483			

Notes: CI: confidence interval; S.E.: standard error; AIC: Akaike Information Criterion.

Figure 2. Tobit Regression Model based on EQ-5D-5L Index Scores in Lung Cancer Patients

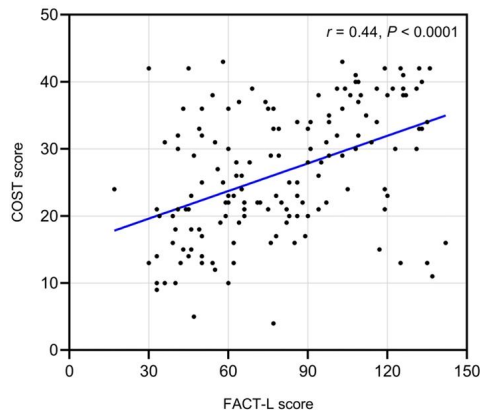


Figure 3. Correlation between Financial Toxicity and Health-Related Quality of Life

4. Health Economics

A closely related term to health economics is healthcare economics, which has a largely overlapping meaning. Strictly speaking, the core content of health economics differs somewhat from that of healthcare economics, and the two use different English terms. Healthcare economics focuses on the efficient allocation of healthcare resources, including improving resource allocation efficiency in pharmaceutical markets, medical institutions, and health insurance payment systems, as well as in the labor market for healthcare professionals and its institutional arrangements, in order to better meet the population's healthcare service needs.

Health economics, while highly related to healthcare economics, places greater emphasis on the influence of individual and environmental factors on health, in addition to examining the role of healthcare services. These factors include genetic makeup, health behaviors and lifestyles, and the social, economic, political, and ecological environments in which people live, highlighting the social attributes of health [4]. Medicine is a discipline dedicated to human health and life. With the continuous advancement of medical technology, the demand for medical treatment and healthcare services has grown significantly. In this process, the application of economics has gradually become indispensable in the medical field. By studying the scarcity and efficiency of resources, economics can help the medical community evaluate the economic benefits of healthcare services, optimize the supply structure of such services, better allocate and utilize medical resources, ensure equitable

access, and improve both the quality and efficiency of healthcare delivery.

At the same time, medical development can positively impact the economy, promoting the growth of the healthcare industry, creating jobs, and improving living standards. Medicine needs the support and guidance of economics to better manage medical resources and improve service quality and efficiency; economics, in turn, benefits from medical advances and innovation to promote sustainable economic development and public health. Only through close cooperation between the two disciplines can sustainable healthcare services and comprehensive social progress be achieved.

From a health economics perspective, the Institute of Hematology at the Chinese Academy of Medical Sciences focused on cancer patients, systematically assessing key factors affecting long-term quality of life and exploring ways to improve it. Innovatively, it developed a four-stage management framework, which is Assessment–Intervention–Transformation–Benefit, and established a four-dimensional intervention system (Physiological–Psychological–Social–Economic) alongside a four-dimensional development paradigm (Specialized–Standardized–Economized–Sustainable).

5. Health Economics and Quality of Life

Looking back through history, medicine first went through the era of spiritualism dominated by witch doctors, when divination, sacrifice, and prayer were almost synonymous with seeking medical treatment. With the advent of evolutionary theory, the development of cell theory, and the discovery of viruses and other microorganisms, medicine entered the modern biomedical model. This model separated disease from the person, focusing on combating illness while neglecting human factors, and sometimes falling into the trap of technology supremacy.

From the patient's perspective, medicine is filled with specialized terminology and highly technical concepts, making it difficult for even well-educated individuals to grasp quickly. This has created professional barriers between doctors and patients, increasing communication costs and intensifying doctor–patient conflicts.

The medical community has long reflected on this issue. In the late 1970s, George L. Engel, a professor of psychiatry at the University of Rochester, proposed that the occurrence and development of disease are related to biological and chemical factors, as well as individual psychological and social factors. Observing and addressing modern health and disease issues from this more comprehensive and objective perspective gave rise to the patient-centered biopsychosocial model. This shift aligns well with China's national conditions and is better suited to contemporary social development. From the perspective of health economics, quality of life further highlights patients' social attributes and their need for social support.

Below, the improvement of quality of life for cancer patients will be discussed from the perspective of social attributes.

5.1 Role Breakthrough and Relationship Reconstruction in Cancer Patients

Role theory suggests that when individuals can no longer play their original social roles, they experience severe psychological shock. Research from MD Anderson Cancer Center in the United States shows that 82% of cancer patients experience varying degrees of role dysfunction after diagnosis, often lasting throughout the entire treatment period.

Major illnesses often lead to a restructuring of family roles and power dynamics, requiring adaptive adjustments across the whole family system. The inversion or displacement of family roles is the most direct impact. The traditional axis of family authority shifts. A survey from Shanghai Cancer Center found that 58% of families experienced role conflict during cancer treatment, and 23% saw deterioration in marital relationships during this time.

Faced with this dual challenge, cancer patients need to develop new survival wisdom. The cancer psychological adaptation model developed by the University of Pennsylvania emphasizes that role reconstruction and relationship repair are key to improving quality of life.

5.2 Quality of Life from a Medical Perspective

The quality of life of cancer patients is a broad concept, generally referring to an individual's

overall satisfaction with their state of being and their environment. From a medical standpoint, quality of life refers to all aspects related to health, including physical symptoms, functional status, family situation, emotions, mental state, and social functioning. It is a subjective, multidimensional, and dynamic concept involving multiple aspects of the patient's physical, psychological, social, and overall subjective experience.

Authoritative organizations often evaluate quality of life through multiple dimensions, such as physical, psychological, social, and cognitive functioning, as well as symptoms and adverse effects related to disease treatment. Commonly used evaluation methods include the Karnofsky Performance Status (KPS, percentage scale) and the Zubrod-ECOG-WHO Performance Status (ZPS, 5-point scale). Additionally, there are specific quality of life (QoL) assessment methods for cancer patients, such as the draft indicators developed in China in 1990 based on foreign references.

Improving the quality of life of cancer patients is a multifaceted task, including active treatment, psychological support, social support, and nutritional management:

5.2.1 Active treatment – Cancer treatment is an important means of improving quality of life. Treatment plans should be tailored to each patient's specific circumstances, including cancer type, stage, and other medical conditions.

5.2.2 Psychological support – Researchers at Columbia University have pointed out that under chronic psychological stress, especially with prolonged negative emotions, mitochondrial energy production declines, reducing energy supply to the brain and other key organs, which in turn changes social behavior. Effective psychological support is crucial for comprehensive treatment and rehabilitation, significantly reducing mental burden, enhancing treatment effects, and improving quality of life.

5.2.3 Social support – Cancer patients often face a long and difficult treatment journey. In addition to direct medical interventions, social support is a key non-pharmacological component, deeply influencing emotional well-being and overall recovery.

5.2.4 Nutritional management – Good nutritional status is essential for cancer treatment. In late-stage patients who have

undergone multiple lines of treatment, especially elderly patients with heavy tumor burden and poor nutritional baseline, targeted nutritional assessment and individualized treatment plans can correct malnutrition, support sufficient and sustained anti-tumor therapy, and improve outcomes.

5.3 Strategies for Improving Quality of Life

5.3.1 Active treatment – Clinical practice increasingly values the impact of drugs and therapies on quality of life, evolving from simply “treating the disease” to “treating the person.” Patient-reported outcomes (PROs) cover multiple dimensions—from symptoms, adverse events, and satisfaction to treatment adherence—capturing patients’ perceived quality of life and symptom burden more accurately than traditional metrics.

5.3.2 Psychological support – The biopsychosocial medical model is receiving growing attention in modern healthcare. Screening and managing emotional stress throughout the treatment process is essential; emotional stress interventions may improve treatment efficacy. The best cancer care often combines “medication + conversation”—chemotherapy along with “talk therapy.”

5.3.3 Social support – Patients and families should cultivate awareness of mental health maintenance, accept the disease and the changes it brings, remove stigma, and integrate family resources to cope with challenges. When psychological distress affects daily life and social function, professional counseling should be sought. Both domestically and internationally, there is active promotion of the “whole-person care model” in oncology, which provides continuous care across physical, psychological, social, and spiritual dimensions. This requires shifting from the biomedical model to one in which medical institutions establish dedicated counseling departments, build multidisciplinary teams (MDTs), and incorporate medical social workers or case managers for psychosocial support.

5.3.4 Nutritional management – Nutrition is closely related to cancer recovery. Before and after treatment, proper diet and good nutrition not only promote tissue repair and maintain immune function, but also prevent infection, muscle breakdown, and physical decline. They improve treatment tolerance, quality of life,

and even reduce recurrence risk. This includes ensuring adequate high-quality protein, fresh fruits and vegetables, limiting refined sugar, and reducing intake of pickled, smoked, and charred foods while maintaining healthy cooking methods.

5.4 Paradigm of Quality of Life for Cancer Patients in the Context of Health Economics

At the patient level, strengthening symptom management reduces extra treatment costs, while encouraging reintegration into society helps restore economic contribution.

At the healthcare provider level, incorporating “financial toxicity” into routine screening makes “invisible suffering” visible; improving communication about costs helps patients make rational choices between efficacy and affordability; promoting treatment-related cost counseling and navigation empowers patients and families to cope with financial burdens throughout the cancer journey.

At the policy level, advancing regional healthcare equity allows patients to access continuous care close to home, reducing non-medical expenses from cross-regional treatment. Developing economic toxicity assessment and management guidelines tailored to China’s reality ensures the implementation of effective interventions for a broader patient population.

A social-ecological intervention strategy can be implemented, building a five-level framework covering individuals, families, institutions, communities, and policies. This approach helps construct a fairer, more sustainable cancer care system, raises awareness in oncology care, reduces patients’ financial burden, and improves health outcomes.

6. Conclusion

Health economics, building on health policy economics, places greater emphasis on the social and environmental factors affecting health. Quality of life—an indicator as important as treatment efficacy—is often overlooked. Under the guidance of health economics, integrating medicine and economics not only meets cancer patients’ social needs but also raises societal attention toward them. Strategies developed from this perspective will greatly promote the visibility of cancer treatment and care, reduce patients’ financial burdens, and improve outcomes. In

the future, with the growing severity of aging populations and increasing elderly care needs, the application of health economics in oncology and geriatric care will become more profound and widespread.

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