

## Quality of life profiles of colon cancer survivors: A three-step latent class analysis

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**Abstract** The aim of this study was to understand better the impact of colon cancer and its treatment on long-term survivor's lives by determining subgroups (latent classes) among these survivors with different quality of life (QoL) outcomes.

For this study data from the PROFILES 2010 colorectal cancer QoL survey was used. PROFILES is a population-based cohort of cancer survivors aiming to assess the physical and psychosocial impact of cancer and its treatment. Included are patients diagnosed between 2000 and 2009 as registered in the Netherlands Cancer Registry (NCR). The NCR is a nationwide, population-based registry of all newly diagnosed cancer patients in the Netherlands. For this study, survivors with non-metastatic (stage I – III) colon cancer ( $n = 1510$ ) were selected. Data on patient and tumor characteristics, received treatment, and follow-up survival status of the selected patients were linked from the NCR. Latent class analysis (LCA) was used to identify subgroups with statistically distinct and clinically meaningful QoL patterns. First, based on fifteen QoL indicators as assessed with the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire C30 a standard LCA estimated the classes. Second, class-membership was determined based on the posterior class-membership probabilities using modal assignment and, third, the effect of covariates on class assignment was assessed using multinomial logistic regression. Follow-up survival across classes was compared using Log-Rank tests and Cox regression analyses.

Model fit assessed by the Bayes Information Criterion (BIC) indicates five classes: (a) good overall QoL (41.2%), (b) good physical and medium cognitive functioning (26.8%), (c) medium physical and good cognitive functioning (15.4%), (d) medium overall QoL (9.3%), and (e) poor overall QoL (7.3%). Significant covariates were cancer stage ( $p < .001$ ), gender ( $p < .001$ ), number of comorbidities ( $p < .001$ ), and the interaction of number of comorbidities and received chemotherapy ( $p < .001$ ). 5-year follow-up survival probabilities ranged from .898 in class 1 to .566 in class 5 ( $p < 0.001$ ).

A five-class solution shows differences in responses on the functioning scales for patients with good to medium overall QoL. Apart from this finding, response patterns within classes are surprisingly uniform across the fifteen EORTC dimensions. Our results show that LCA can be a useful tool for better understanding the impact of cancer and its treatment. Our future research will be about how to translate current findings into personalizing care of long-term colon cancer survivors.

**Keywords** quality of life; colon cancer; three-step latent class analysis; personalized care; EORTC; PROFILES registry; Netherlands cancer registry

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