American Journal of
Preventive Medicine

RESEARCH ARTICLE

The Relationship Between Life Satisfaction and Healthcare Utilization: A Longitudinal Study

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Introduction: Studies have highlighted the importance of life satisfaction or, more generally, happiness, on health. However, there are few studies that have prospectively assessed the relationship between life satisfaction and healthcare utilization and costs.

Methods: Participants were from three national survey cycles conducted between 2005 and 2010 to future healthcare utilization up to 2015. Analysis was conducted in 2016–2017. Annual per person costs were calculated and individuals ranked. Adjusted multinomial logistic regression models were used to quantify the association between life satisfaction and being in the top 5% or top 6%–50%, compared to the bottom 50%, during follow-up.

Results: After exclusions, the study population included 85,225 adults. Increasing life dissatisfaction was associated with higher healthcare utilization and costs. In the fully adjusted model, the odds for those with the lowest level of life satisfaction being in the top 5% of healthcare costs relative to the lowest 50% is 3.05 (95% CI=1.61, 5.80). Those with the lowest life satisfaction were also at increased odds of being in the middle utilization category (6%–50%) with a significant OR=2.24 (95% CI=1.60, 3.14). All trends for increasing dissatisfaction were significant ($p<0.001$).

Conclusions: Life dissatisfaction was significantly associated with being a high-cost user in the future. This relationship persisted after adjustment for demographic factors, comorbidity, socioeconomic factors, and health behaviors. This study points to the importance of considering broader correlates of well-being with respect to future healthcare utilization and costs.

Am J Prev Med 2018;▮(▮):▮▮▮–▮▮▮.

INTRODUCTION

Life satisfaction is a reliable dimension of quality of life, encompassing physical, mental, and social well-being.[1] Recent studies have highlighted the importance of life satisfaction, or more generally, happiness, on health.[2] The majority of research has been primarily focused on the mental health aspects of life satisfaction, but there is recent evidence suggesting that the health impacts of life satisfaction may be more widespread.[3] A number of studies have emphasized the impact that life satisfaction has on healthy behaviors, risk of chronic disease, longevity, and a proactive approach to maintaining a healthy lifestyle.[4,5] However, there are few population-based studies that have prospectively assessed the relationship between measures of life satisfaction and the impact on the healthcare system. The lack of literature in this area results from a paucity of population-based data that links both information on life satisfaction and healthcare utilization in a longitudinal manner.

The relationship between health behaviors, chronic illness, and life satisfaction is likely bidirectional. Chronic illness and health-related risk factors have been demonstrated to have an independent association with life dissatisfaction, whereas optimism, life satisfaction, and

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0749-3797/$36.00
https://doi.org/10.1016/j.amepre.2018.04.004

social inclusion have revealed their protective properties in health respectively.[6] People who are happy and satisfied with their life exhibit better self-rated health, absence of chronic and life-limiting conditions, as well as higher engagement with physical activity programs.[7] Enrichment of life satisfaction through the use of psychological intervention has proven meaningful to enhancing subjective and psychological well-being.[8,9] These factors may go on to affect the frequency of healthcare utilization and the necessity of healthcare services for existing disease management.

In healthcare systems worldwide, high-cost users (HCUs) disproportionately account for a majority of healthcare spending costs.[10–12] Previous research has identified important upstream determinants, as well as the impact that multimorbidity has on high healthcare utilization.[13,14] In order to improve the sustainability of the healthcare system, an in-depth understanding of all risk factors and social characteristics that perpetuate concentrated healthcare spending in a small fraction of the population is necessary. Importantly, per-person healthcare costs reflect the combination of frequency, intensity, and complexity of healthcare utilization and thus are a meaningful and important metric of healthcare utilization.

The goal of this study is to investigate the impact of life satisfaction on patterns of future healthcare utilization by linking multiple cycles of a national population-based survey to subsequent health services utilization data from a single-payer system in Ontario, Canada.

METHODS

Study Sample

The study design used was a population-based longitudinal study of adult Ontario Canadian Community Health Survey (CCHS) participants combining several cycles to increase sample size. Participants from CCHS cycles for years 2003, 2005, and 2007/2008 were linked to the Registered Persons Database, which allows for linkage to population-based health administrative databases for Ontario, Canada. That is, for each cycle, each individual has 6 years of follow-up from their baseline. The CCHS survey administered by Statistics Canada, representative of 98% of the Canadian population aged ≥12 years living in private dwellings. The CCHS is a main data source for health surveillance and population health research in Canada. Detailed survey methodology is available elsewhere.[15]

All permanent residents of Ontario are covered by a single-payer insurance system (Ontario Health Insurance Plan [OHIP]) and all related healthcare encounters are recorded in health administrative databases. Healthcare spending was calculated for all key sources of healthcare expenditure, including hospital admissions, same day surgery, emergency department visits, physician payments, rehabilitation, complex continuing care, and prescriptions filled for individuals eligible for the Ontario Drug Benefit (seniors, individuals living in long-term care or special care homes, residents receiving social assistance, and those with high relative drug costs). Healthcare spending was calculated using a person-centered methodology developed for Ontario administrative data.[12,16] Annual per person costs based on individual healthcare transactions were calculated for each of the 6 years following the interview and individuals were ranked according to percentiles of cost. HCUs were defined as those who ranked in the top 5% according to total annual spending for >1 year during the follow-up period.

The study design received ethics approval from the Ethics Review Board of the University of Toronto (Protocol Reference: 32666).

Measures

The main exposure variable available in the cycles of the surveys used in this study is self-reported life satisfaction; respondents were invited to select from the following options: *How satisfied are you with your life in general?* Response options: *very satisfied, satisfied, neither satisfied or dissatisfied, dissatisfied, or very dissatisfied*. Very satisfied and satisfied were collapsed due to small sample sizes and minimal differences between the two categories in terms of impact on health. It should be noted that future cycles of the CCHS (not included in this study) score this question according to a 10- or 11-point scale, which is then converted to the aforementioned categories; however, those scorings were not used in the earlier cycles. This single question has been widely used to study life satisfaction and is established as reliable and valid.[17,18] Previous research supports the stability of this measure over time.[19–22]

Gradients of healthcare utilization costs were defined as a multicategory outcome with the three categories: the top 5%, who are considered HCUs, the top 6%–50%, and the bottom 50%.[23] Annual spending for healthcare utilization groups was tracked using the person-centered costing approach[12] for 6 years following interview. The outcome of interest was annual healthcare cost ranking for (top 5%, top 6%–50%, bottom 50%) categorized for each of the 6 years following CCHS interview.

Prior healthcare utilization was estimated from administrative data captured in the 2 years prior and aggregated diagnosis groups (ADGs)[24] scores, a measure of comorbidity, were calculated. ADGs have previously been validated for use in Ontario and have been shown to be reliable for morbidity adjustment.[25] All other important covariates were captured from interview questions, including demographics, socioeconomic, health status, and health behavioral indicators. These included age, sex, immigrant status, household education and income, smoking status, alcohol consumption, physical activity, and BMI derived from height and weight.

Statistical Analysis

Participants were further excluded for nonresponse on the life satisfaction measure or lost OHIP eligibility during follow-up. Any participants that were HCUs in the year prior to the survey were removed at baseline, representing only 121 individuals or <0.1% of the sample (Figure 1).

The weighted distribution of demographic, socioeconomic, health status, and behavior characteristics were estimated