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Original Research

Large variation in predictors of mortality by levels of self-rated health: Results from an 18-year follow-up study

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ABSTRACT

Objectives: To analyze the variation in factors associated with mortality risk at different levels of self-rated health (SRH).
Study design: Retrospective cohort study.
Methods: Cox regression analysis was used to examine the association between mortality and demographic, socioeconomic and health-related predictors for respondents with good, average, and poor SRH in a longitudinal data set from Estonia with up to 18 years of follow-up time.
Results: In respondents with good SRH, male sex, older age, lower income, manual occupation, ever smoking, and heavy alcohol consumption predicted higher mortality. These covariates, together with marital status, illness-related limitations, and underweight predicted mortality in respondents with average SRH. For poor SRH, only being never married and having illness-related limitations predicted mortality risk in addition to older age and male sex.
Conclusions: The predictors of all-cause mortality are not universal but depend on the level of SRH. The higher mortality of respondents with poor SRH could to a large extent be attributed to health problems, whereas in the case of average or good SRH, factors other than the presence of illness explained outcome mortality.

Introduction

An independent association between self-rated health (SRH), a common measure of individual health status, and mortality has been reported in numerous studies. Although previous research has highlighted relative differences in the SRH-mortality association between various population groups,[1–3] lower health ratings are generally associated with

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higher mortality risk even after controlling for age and alternate health markers in most settings.[4,5] The nearly universal association between SRH and mortality relies on the validity of SRH as a summary measure of individuals' health status.[6] SRH incorporates relevant health information and past experiences within socio-environmental and cultural conventions, providing a comprehensive and accurate reflection of an individual's health status. SRH has been found to be a better predictor of mortality than the type or number of symptoms experienced,[7] physician-rated health assessments,[8] or multi-item health-related quality of life measures.[9] Although most studies on the SRH-mortality association have focused on the lower end of the SRH scale, the levels of SRH present a clear gradation in terms of survival time and mortality risk.[10,11]

While all health assessments are driven by the 'health component',[12] poor SRH primarily reflects the presence of ill health, modified by the severity, duration, and restrictions posed by ill health.[13,14] For example, Murata et al.[14] found that illness and functional status accounted for up to 40% of the variance in poor SRH. Also, it has been shown that previous experience of chronic disease or relevant symptoms results in a stronger SRH-mortality association than in healthy individuals with equivalent SRH ratings.[15] In contrast, positive health assessments have previously been linked to perceptions of vitality,[16] lifestyle aspects,[17] and general well-being as well as psychological features such as self-esteem.[18] Although these salutogenic factors contribute to positive SRH assessments, they are less likely to explain the direct biological pathways in the SRH-mortality association compared with factors related to poor SRH which presumably contain more health-status–specific information.

This graded association reflects the differences in evaluation mechanisms that underlie SRH. The variation in the determinants associated with different levels of SRH found in several previous studies[13,18–20] has led to the understanding that positive and negative SRH are not simply a mirror image of each other but rather reflect alternative health concepts.[19,20] Although subjective health evaluations and objective health outcomes do not necessarily share the same set of determinants,[21] it is possible that the predictors explaining the SRH-mortality association might also vary depending on the level of SRH. However, as yet, to the best of our knowledge, the possible variation in factors associated with mortality at different levels of SRH has not been studied.

Eastern Europe has witnessed rapid changes in population health since the post-communist transition period in the 1990s. In the Baltic countries, the declining life-expectancy reached its lowest in 1994 with large differences in mortality between upper and lower socioeconomic groups.[22] These contrasting developments, sometimes labeled as the East–West health divide[23,24] serve as a setting for the present study. Following the argument that a mortality risk persists, albeit not proportionally in all categories of SRH, this study will explore whether different levels of SRH are unique predictors in terms of mortality risk and/or the specific factors associated with that risk. This will be done by using a number of demographic and socioeconomic indicators, as well as measures of health behaviour, physical, and psychological health from a retrospective follow-up study in Estonia.

Methods

Data

The baseline data came from the Estonian Health Interview Survey.[25] The Estonian Health Interview Survey was a cross-sectional survey of health and health behaviours that was carried out through face-to-face interviews between November 1996 and February 1997. In total, 4711 interviews were completed with an adjusted response rate of 84.3%. The respondents were retrospectively followed up until 31 July 2015 (over 18 years of follow-up) with survey data linked individually to Population Registry data for mortality and migration status. The overall attrition rate was very low (0.6%) with only 26 individuals lost in follow-up. The present study used data from 4030 respondents aged 25–80 years at the time of the interview (1786 men and 2244 women), 1601 (40% of the subsample) of whom had died during the follow-up period. The study protocol was approved by the Tallinn Ethical Committee of Medical Research (approval no 456; 14.11.2013).

Measures

SRH was measured with a single question 'How do you evaluate your health in general?' with five possible response alternatives: 'very good', 'good', 'average/satisfactory', 'bad', or 'very bad'. The answers were split into three categories (1) good (response options very good and good), (2) average (average/satisfactory), and (3) poor (bad/very bad). The selection of demographic, socioeconomic, and health-related covariates was based on previous research on health determinants in similar settings.

Demographic covariates included age at baseline (continuous), sex, ethnicity, and marital status. Ethnicity was based on self-reported ethnic identity aggregated into two subcategories, (1) the main ethnic group (ethnic Estonians) and (2) other ethnic groups, with Russians, Ukrainians, and Belarusians comprising the largest share (hereafter referred to as non-Estonians). For marital status respondents were categorized as being either (1) married or cohabiting, (2) never married or (3) widowed, separated or divorced.

Educational level, income, and occupation were used to specify respondents' socioeconomic status at baseline. Educational level was measured by the highest level of education obtained and was categorized as (1) tertiary (15–16 years of schooling on average), (2) upper secondary (10–14 years), and (3) lower secondary or less education (<10 years). For income, average personal monthly net income (converted from *Kroons*) was divided into quartiles with the cut-off points being 144.2, 72.4, and 58.8 Euros, respectively. Occupation was coded using the ISCO-88 classification and referred to the main occupational class during the respondent's working life. It was dichotomized into (1) non-manual, and (2) manual occupation.

Health-related covariates included six measures. Health status at baseline was assessed in terms of having or not having limitations in daily activities because of health problems. The composite score of self-reported limitations consisted of seven items including functional limitations