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# Prediction of survival: a comparison between two subjective health measures in an elderly population

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## Abstract

A large amount of evidence shows that the subjective evaluation of health is a predictor of survival in many different populations. Subjective health (SH) is measured using different types of measures such as a general evaluation of health or a comparative evaluation of health. The aim of this study was to compare the prediction of survival by two measures of SH (a general measure and an age-related measure) and evaluate the association with other variables in an elderly population.

The baseline survey was conducted during 1994, covering 1138 men and women aged over 70. The survival status was ascertained 7 years later.

After adjustment for age, sex, education, marital status, perceived socioeconomic status and presence of diseases the two SH measures were found to be predictors of mortality, but only in men. In men, there was no significant difference between the two types of SH measures in their prediction of mortality. Also in men, when there was only one or no disease, being married had a protective effect compared with not being married when both types of SH measures were used.

In elderly women, the association between the two types of SH and survival diminished after adjusting for the various variables. However, the general SH measure may be the preferable measure to use when needed. Education in women was associated with mortality only via the age-related SH measure.

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## Introduction

Subjective health (SH) is a common measure of health in health surveys and health research. Many terms are used to describe the variable, such as self-rated health, self-reported health, self-assessed health, self-perceived health, or perceived health status. This measure is based on the assumption that the individual can evaluate his or her health. The evaluation of health seems to be based on three factors: biomedical or disease-oriented factors

(presence of diseases), emotional or general feeling, and functional-related factors (Kaplan & Baron-Epel, 2003). The integration of these factors enables the individual to perceive his/her health and give an integrated answer to the question.

The strength of this measure lies in its predictive value of health outcomes, especially survival, which are independent of culture and ethnic background (Appels, Bosma, Grabauskas, Gostautas, & Sturmans, 1996; Idler, 1992; Idler & Benyamini, 1997). SH was a predictor of survival in young and elderly populations (Idler & Angel, 1990; Rakowski, Mor, & Hiris, 1991; Heistaro, Jousilahti, Lahelma, Vartianen, & Pushka, 2001). Moreover, studies using a follow-up design show that poor SH is a good predictor of subsequent greater

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disability (Kaplan, Strawbridge, Camacho, & Cohen, 1993; Idler & Kasl, 1995), morbidity (Ferraro, Farmer, & Wybraniec, 1997) and utilization of medical care (Miilunpalo, Vuori, Oja Pasanen, & Urponen, 1997; Angel & Gronfein, 1988; Idler, 1993; Idler & Benyamini, 1997). Medical indicators, self-reported chronic diseases, perceived physical fitness and function indicators, were also associated with mortality but SH was still an independent predictor of mortality after adjustment for age, sex, and social status (Miilunpalo et al., 1997; Benyamini, Leventhal, & Leventhal, 1999). Idler and Benyamini (1997) reviewed 27 studies looking at the predictive value of mortality by SH, and concluded that SH is an independent predictor of mortality after adjusting for various measures associated with survival (Idler & Benyamini, 1997).

In their review they reported that the prediction of survival by SH was more apparent in men than in women (Idler & Angel, 1990; Idler & Kasl, 1991; Idler, Kasal, & Lemke, 1990; Idler & Benyamini, 1997; Jylha, Guralnik, Ferrucci, Jokela, & Heikkinen, 1998). Since then additional studies have continued this line of research. Helmer, Barberger-Gateau, Letenneur, and Dartigues (1999) followed up 3660 French elderly community residents for 5 years and found that SH predicted survival only in men after adjusting for depressive symptomatology, cognition, and disability. Heistaro et al. (2001) followed up 21,300 working aged people for 23 years in Finland and found that poor SH predicted mortality after adjustment for other measures, both in men and women. Kaplan, Barell, and Lusky (1988) also found no difference between men and women.

However, Onawola and LaVeist (1998) reported that SH evaluation was an independent predictor of mortality for women, but not for men in an African-American population. Other studies yielded similar findings (Grant, Piotrowski, & Chappell, 1995; McCallum, Shadbolt, & Wang, 1994; Simons, McCallum, Friedlander, & Simons, 1996; Wolinsky & Johnson, 1992). The differences between studies may correspond with the various populations and studies and depend on the measures adjusted for. Except for the variables mentioned, other variables may be associated with SH and mortality and explain the association between the two, such as social or cultural variables (self-esteem, social support, economic status, and feeling of control). The prediction of survival by SH was stronger in high socioeconomic groups compared to low socioeconomic groups (Burstrom & Fredlund, 2001). Self-esteem and social support are associated with SH (Carmel, 2001) and so is social capital (Kawachi, Kennedy, & Glass, 1999). Liang et al. (1999) found that financial difficulties and strain and death of a spouse or child were associated with mortality through their effect on SH. These social measures may add to the explanation of the predictive

value of SH and explain variability in the various studies.

Due to the independent predictive value of mortality and other health indicators, most researchers considered SH a valid and reliable indicator of a person's overall health status. It provides researchers with a valid, cost-effective means of health assessment in studies in which other forms of health information are lacking (LaRue, Bank, Jarvik, & Hetland, 1979; Ferraro et al., 1997). Nowadays almost all surveys and questionnaires dealing with health include a question regarding the evaluation of SH.

The wide spread use of SH demands a thorough understanding of the measure. A few types of questions have been used to measure SH. The measures elicit the respondent's self-evaluation of his/her health status. Often emphasis is placed on health at the given time ("nowadays", "at the present time") and sometimes on health "in general", "all in all". But in some studies a frame of reference is provided: "compared with others your age" or "in relation to yourself in the past". Until 1981 the US National Health Interview Survey (NHIS) used the question "Compared to other persons \_\_\_'s age..."; in 1982 the question was changed to "Would you say \_\_\_'s health in general is..." (Waidmann & Bound, 1992). The different studies calculating the predictive value of SH also used different versions of the question. Idler and Benyamini (1997, p. 22), in their review of SH and mortality, reported that although the question measuring SH evaluation differed in the 27 studies they reviewed, "the consistency of the effects seems to show that the concept of self-rated health status is relatively insensitive to the semantic variations in the question eliciting it".

Eriksson, Unden, and Elofsson (2001) compared three measures of SH with different wording and reported that the differences between the SH measures were in most cases marginal. They concluded that the different measures represented parallel assessments of SH. However, this assumption was found to be only partially true. Baron-Epel and Kaplan (2001) found that the agreement between two SH assessment measures, a general question on SH and an age-related question on SH, differed in specific groups. Generally the older population rated their health better when asked to evaluate their health compared to people their age, and younger people rated their health worse when comparing it to people their age (Baron-Epel & Kaplan, 2001; Kaplan & Baron-Epel, 2003). Among respondents aged 65–75 with no reported diseases and those with less than 12 years of education with no reported diseases, agreement between the two questions was poor. These two groups reported better health when they were asked to compare their health with that of people of their age and sex. Excellent agreement between the two questions was reported in those aged 55–64 with no diseases.

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