Household income is strongly associated with health-related quality of life among Japanese men but not women

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Summary *Objectives*. As socio-economic status (SES) strongly reflects individual economic status, evaluating the association between SES and health could provide information that is important for planning integrated economic and public health policies. We examined the association between annual household income as a measure of SES and the eight scale scores of the Medical Outcomes Study Short Form-36 Health Survey (SF-36) as a quantifier of health-related quality of life (HRQOL) in Japan.

Study design. Cross-sectional survey.

Methods. Data were from the SF-36 national survey in Japan. A total of 4500 people aged 16 years or older were selected from the entire population of Japan using stratified-random sampling, and 3395 responded to the survey.

Results. Men with lower levels of annual household income had lower scores in all SF-36 domains. However, only 'general health perceptions' and 'social functioning' showed statistically significant trends among the women surveyed. In the subgroup of women working full-time, there were no domains that showed significant trends.

Conclusions. A strong association exists between annual household income and SF-36 scores among men, but there is only a limited association among women. The employment and economic policies that affect annual household income potentially influence HRQOL.

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Introduction

The association between socio-economic status (SES) and health has become an important issue in public health.[1–6] Studies show that low SES,

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including both childhood and present status, is associated with higher mortality rates,[1,4] higher prevalence of injury and illness,[2,3,5] and more high-risk behaviours associated with chronic illnesses[6] than are observed in high-SES groups. As SES strongly reflects individual economic status, evaluating the association between SES and health could provide important information for planning integrated economic and public health policies. Such information would allow policy makers to evaluate, from a public health perspective, how economic policies, including those regarding employment and stimulation of demand, affect health. The aim of the present study was to examine the association between SES and health-related quality of life (HRQOL), as a concept of health, among the Japanese general population.

The concept of health has recently been expanded and the World Health Organization has pointed to the importance of HRQOL. There are various definitions of HRQOL. The Medical Outcomes Study Short-Form 36-Item Health Survey (SF-36) is one of the generic HRQOL instruments. SF-36 is based on a conceptual model consisting of physical and mental health constructs, and it is designed to measure perceived health status and daily functioning. It consists of 36 items that are scored in the following eight domains:[7] physical functioning (10 items); role-physical functioning (four items); bodily pain (two items); general health perception (five items); vitality (four items); social functioning (two items); role-emotional functioning (three items); and mental health (five items). The score on each scale ranges from 0 to 100, with a low score indicating poor health or great disability. SF-36 is widely used and is available in many languages, including Japanese.

Several studies have evaluated the association between SES and SF-36. Jenkinson et al.,[8] Hemingway et al.[9,10] and Breeze et al.[11] have all suggested that there is an association between SES and SF-36. Hemingway et al.[11] examined the association between employment grade as SES and SF-36 in British civil servants. Significant differences were found between the employment grades for seven of the eight SF-36 domains (excluding 'vitality') among men. Significant differences for women were found between the employment grade and the following four domains: 'physical functioning', 'bodily pain', 'general health perceptions' and 'social functioning'.

The definition of SES varies among studies that seek relationships with health. In addition to assets and annual household income, the concept of SES is composed of other factors, including employment grade, location of residence, race and educational background. The importance of each factor may differ between countries and cultures.[12] Japan is a country of almost uniform ethnicity. Furthermore, the unique seniority system of employment may have an influence on the employment grade. Therefore, Japan could have different types of association between SES and illness and between SES and HRQOL compared with other countries. We collected annual household income as an important index of SES. In Japan, household income is derived primarily from the male's earned income, which reflects their professional status. Household income is a good indicator of material circumstances.[13] The aim of the present study was to examine the association between SES (using annual household income as an indictor) and HRQOL (using SF-36) in the general Japanese population.

Methods

Subjects and study methods

The study design was cross-sectional. We used previously collected data that had been used to validate the Japanese version of SF-36 and calculated a national standard of scale scores of the SF-36 for Japan; this is referred to hereafter as the national survey.[14-16] The details of the national survey were published by Fukuhara et al.[14] Briefly, a total of 4500 people aged 16 years or older were selected from the entire population of Japan using stratified-random sampling. A self-administered questionnaire was mailed, followed by a visit to the subjects to collect the questionnaires. The Japanese version of SF-36 and questions on the topics, as detailed in Table 1, with multiple choice responses were included in the questionnaire.

Outcomes

The primary outcomes of the study were the eight domain scores of the Japanese version of SF-36. The Japanese version was validated for the general Japanese population.[14,15] Cronbach's alpha of this version was computed to assess internal consistency reliability, and alpha exceeded 0.70 for all eight domains.[14]

Statistical methods

We used analysis of covariance to estimate the mean differences among six 'annual household income' groups for each SF-36 domain. Men and women were analysed separately. The adjustment