ELSEVIER

Journal of Clinical Epidemiology 55 (2002) 364–370

Journal of Clinical Epidemiology

Self-rated health, chronic diseases, and symptoms among middle-aged and elderly men and women

Anu Molarius*, Staffan Janson

Centre for Public Health Research, Karlstad University, Karlstad, Sweden

Received 6 December 2000; received in revised form 22 August 2001; accepted 5 September 2001

Abstract

The objective was to study the association between chronic diseases, symptoms, and poor self-rated health among men and women and in different age groups, and to assess the contribution of chronic diseases and symptoms to the burden of poor self-rated health in the general population. Self-rated health and self-reported diseases and symptoms were investigated in a population sample of 6,061 men and women aged 35–79 years in Värmland County in Sweden. Odds ratios (OR) and population attributable risks (PAR) were calculated to quantify the contribution of chronic diseases and symptoms to poor self-rated health. Depression, neurological disease, rheumatoid arthritis, and tiredness/weakness had the largest contributions to poor self-rated health in individuals. Among the elderly (65–79 years), neurological disease and cancer had the largest contribution to self-rated health in men, and renal disease, rheumatoid arthritis, and cancer in women. Among the middle-aged (35–64 years), depression and tiredness/weakness were also important, especially in women. From a population perspective, tiredness/weakness explained the largest part of poor self-rated health due to its high prevalence in the population. Depression and musculoskeletal pains were also more important than other chronic diseases and symptoms at the population level. Even though many chronic diseases (such as neurological disease, rheumatoid arthritis, and cancer) are strongly associated with poor self-rated health in the individual, common symptoms (such as tiredness/weakness and musculoskeletal pains) as well as depression contribute more to the total burden of poor self-rated health in the population. More preventive measures should therefore be directed against these conditions, especially when they are not consequences of other diseases. © 2002 Elsevier Science Inc. All rights reserved.

Keywords: Self-rated health; Chronic diseases; Symptoms; Population studies

1. Introduction

Self-rated health has been found to be a strong predictor of morbidity and mortality [1–5]. A large part of this effect is mediated through disease and disability, but self-reported health remains a significant predictor of mortality even after controlling for present disease or dysfunction [4–6]. Furthermore, self-rated health is an indicator of well-being, quality of life [7–8], and a significant predictor of utilization of health care services [9–10].

It has been found that different people have different interpretations of self-rated health. Some people think about specific health problems when asked to rate their health, whereas others think in terms of either general physical functioning or health behaviors [11]. The interpretations of self-rated health also vary by age and gender [11–13].

Many physiological and psychosocial determinants of self-rated health have been described in the literature, but the main determinant of self-rated health is physical health [4,14–16]. Several studies have considered the effect of chronic diseases and symptoms on self-rated health, but the results vary depending on what conditions have been taken into consideration and on the composition of the study population [8,17–20]. In addition, most of the studies have only looked at the association at the individual level. From a public health perspective it is, however, also important to get insight into the impact of chronic diseases and symptoms on self-rated health at the population level. While results at the patient level express which diseases and symptoms are most important for individual patients, results at the population level express which part of the total burden of poor self-rated health could be prevented if certain diseases and symptoms could be eliminated. This can be done by calculating population-attributable risks which are based both on the strength of association between a specific condition and poor self-rated health, and the prevalence of the condition in the general population.

* Corresponding author. Västmanland County Council, Department of Community Medicine, 721 51 Västerås, Sweden. Tel.: +46 21 174583, Fax: +46 21 174515.

E-mail address: anu.molarius@1tvastmanland.se

0895-4356/02/$ – see front matter © 2002 Elsevier Science Inc. All rights reserved.
PII: S0895-4356(01)00491-7

We wanted to study the association between chronic diseases, symptoms, and poor self-rated health, and to identify the conditions with the largest contributions to ill health in the general adult population using a wide range of diseases and symptoms. This was done both at individual and population levels. We also investigated whether the associations between chronic diseases/symptoms and self-rated health vary by gender and age group.

2. Methods

The study population comprised 6,061 men and women aged 35–79 years, a representative sample of the adult population in Värmland County in western Sweden. The data was gathered using a postal survey questionnaire. The data collection was done in March–May 2000. The overall response rate was 74%.

Self-rated health was measured using the following question: "How would you rate your general state of health?" with the response options: "Very good," "Good," "Neither good or bad," "Poor," and "Very poor." Poor self-rated health was defined as "Poor" or "Very poor." Chronic diseases were asked about with a question, "Do you have one or several of the following chronic diseases?" and listing 16 different options (see Table 1). The chronic diseases in the questionnaire were selected in such a way that they would represent major public health problems and cover a wide range of conditions. Physical and mental symptoms (see Table 1) were asked with the question, "Have you during the last three months experienced one or several of the following symptoms?" with a list of 11 symptoms with the options: "Has not bothered," "Occasionally," "Several times," and "Practically all the time." The symptoms in the questionnaire cover complaints which have been found to be frequent in the general population [21].

Table 1
Prevalence of poor self-rated health and chronic diseases and symptoms among the participants in Värmland County

	All	Men		Women	
Age group	35–79	35–64	65–79	35–64	65–79
Response rate (%)	74	65	78	77	77
N	6061	1634	1275	1916	1236
Poor self-rated health (%)	8.6	7.9	8.6	8.8	10.2
Chronic diseases (%):					
Cancer	2.0	0.8	4.0	2.3	3.1
Diabetes	4.7	3.0	10.5	2.6	9.6
CVD	8.0	4.5	24.1	3.0	15.7
Rheumatoid arthritis	2.8	1.8	3.0	2.9	4.8
Asthma	3.5	2.9	5.0	3.1	4.5
Eczema/other skin disease	5.0	3.9	6.9	5.0	5.8
Gastrointestinal disease	4.4	2.9	4.3	4.7	7.8
Urinary incontinence	3.8	0.5	4.1	4.0	11.6
Renal disease	0.6	0.6	1.2	0.4	0.3
Neurological disease	1.5	1.8	2.3	1.0	1.6
Depression	4.1	3.6	2.4	5.0	4.6
Other disease[a]	7.0	6.3	6.0	8.5	6.0
Symptoms (%):					
Shoulder/neck pain	34.0	27.3	27.2	42.1	36.7
Back pain	30.8	25.2	26.3	35.5	37.8
Pain in limbs	32.7	26.5	31.1	35.8	43.2
Tiredness/weakness	28.4	22.6	22.1	36.3	28.7
Sleeplessness	20.9	15.9	14.5	25.9	26.8
Melancholy	14.4	11.3	8.4	18.9	15.9
Other symptoms[b]	6.0	4.6	5.2	7.6	6.3

[a]Excluding the diseases mentioned above and allergic reactions in eyes or nose, non-allergic disease in respiratory system, blood disease, and disease of the thyroid gland.

[b]Excluding the symptoms mentioned above and migraine, headache, stomach pain, and anxiety.

As background information, the prevalences of poor self-rated health and self-reported diseases and symptoms are reported. The prevalences are weighted in such a way that they are representative for the total population in Värmland. Differences in the prevalences by age group and gender were tested using a chi-squared test.

Odds ratios for the risk of poor self-reported health were calculated using logistic regression analysis. First, all chronic diseases were included in the model to estimate the association between diseases and poor self-rated health adjusting for other diseases. Second, all symptoms were added into the model to estimate the association between symptoms and poor self-rated health adjusting for other symptoms and for chronic diseases. The analysis between symptoms and poor self-rated health was thus adjusted for chronic diseases to estimate the risk of poor self-rated health associated with symptoms that is not explained by disease. The number of observations in the analysis between symptoms and self-rated health was smaller than the total sample size, because all respondents did not answer all questions about the symptoms. The analysis between chronic diseases and poor self-rated health was not adjusted for symptoms, since many diseases are characterised by symptoms which cannot be separated from the actual disease.

For the overall association between chronic diseases, symptoms, and self-rated health (ages 35–79 years), the odds ratios were also adjusted for gender and age group. All diseases and symptoms which were listed in the questionnaire were included in the analyses. However, as allergic reactions in eyes or nose, non-allergic disease in the respiratory system, disease of the thyroid gland, migraine, headache, stomach pain, and anxiety were not associated with poor self-rated health in any of the studied categories, they have been excluded from the presentation. In addition, blood disease was excluded from the presentation even though it was associated with poor self-rated health, because it was too rare in the population to ascertain statistical significance. The odds ratios for stated symptoms have been calculated contrasting those reporting the symptom "practically all the time" or "several times" with those reporting "has not bothered" or "occasionally." Gender and age group specific odds ratios were calculated, and differences between genders and age groups (35–64 and 65–79 years) in the contribution of the chronic diseases and symptoms to self-reported health were confirmed by testing interaction terms.

To calculate the proportion of the total prevalence of poor self-related health that could be attributed to chronic diseases and symptoms, population attributable risks (PAR) were calculated for each condition with a statistically significantly increased risk using the following formula.

$$\mathrm{PAR} = \frac{p(\mathrm{OR}-1)}{p(\mathrm{OR}-1)+1}[22],$$

where p = the proportion of exposed (persons with the condition) in the population, and OR is the corresponding odds ratio. Because the prevalences of different diseases and symptoms overlap, the proportions explained are not independent of each other and cannot therefore be summed up to 100%. The PARs should therefore be interpreted with caution and merely in relative, not in absolute, terms.

3. Results

Table 1 shows the number of respondents by gender and age group, response rates, and prevalence of poor self-rated health and self-reported diseases and symptoms. Self-reported health deteriorated with age ($P < 0.001$) and the prevalence of diseases, but not symptoms, increased. The most frequent symptoms were pains in the musculoskeletal system. The most prevalent disease among the elderly (65–79 years) was cardiovascular disease (CVD), while among the middle-aged (35–64 years) no disease in particular dominated. Men had a higher prevalence of CVD than women ($P < 0.001$). There was no difference in self-reported health between men and women ($P = 0.12$), but women reported more symptoms than men did ($P < 0.001$).

At the individual level, depression had the strongest association with self-rated health (Table 2). Also neurological disease, rheumatoid arthritis, and cancer were strongly related to poor self-rated health when adjusted for other diseases. Among the middle-aged, depression had the largest contribution to self-rated health. Among the elderly, neurological disease and cancer had a strong association with self-rated health in men, and rheumatoid arthritis and cancer in women. The differences between genders and age groups were, however, not statistically significant. Renal disease was strongly associated with poor self-rated health in elderly women, but the confidence intervals were wide due to a very low prevalence in the population.

When looking at the independent contribution of symptoms, tiredness/weakness had the largest contribution to self-rated health in individuals (Table 3). The association between tiredness/weakness and self-rated health was more pronounced among women than among men, but the difference was not statistically significant. Also back pain in elderly men and shoulder/neck pain in elderly women were strongly associated with poor self-rated health.

There was a dose-response relationship between tiredness/weakness and poor self-rated health. When adjusted for other diseases and symptoms, the odds ratio was 1.8 (95% CI: 1.0–3.3) for "occasionally," 6.6 (95% CI: 3.8–11.6) for "several times," and 20.0 (95% CI: 11.0–36.2) for "practically all the time" in the total population when compared with the category "has not bothered."

At the population level, tiredness/weakness, depression, and musculoskeletal pains explained the largest part of poor self-rated health due to their high prevalence in the population (Table 4). Among the 65–79 years old, especially among women, the chronic diseases such as CVD, and rheumatoid arthritis, also had large population-attributable risks, whereas the contribution of neurological disease was smaller due to its low prevalence in the population. Depres-

Table 2
Associations (odds ratios and 95% confidence intervals) between chronic diseases and poor self-rated health

	All[a]	Men		Women	
Age group	35–79	35–64	65–79	35–64	65–79
N	6061	1634	1275	1916	1236
Chronic diseases:					
Cancer	5.1 (3.3, 8.0)	8.0 (2.3, 27.5)	5.5 (2.5, 12.1)	1.3 (0.4, 4.2)	8.0 (3.6, 17.8)
Diabetes	2.1 (1.5, 3.0)	3.7 (1.7, 7.9)	1.6 (0.9, 2.9)	2.6 (1.1, 5.7)	2.4 (1.3, 4.4)
CVD	2.5 (1.9, 3.3)	3.8 (2.0, 7.2)	1.9 (1.2, 3.0)	2.0 (0.9, 4.5)	3.7 (2.3, 6.0)
Rheumatoid arthritis	6.3 (4.4, 9.0)	6.7 (2.7, 16.5)	4.2 (1.8, 9.4)	5.9 (3.0, 11.7)	8.8 (4.7, 16.4)
Asthma	2.6 (1.8, 3.8)	2.1 (0.9, 5.0)	1.9 (0.9, 4.1)	2.8 (1.4, 5.3)	3.8 (1.8, 8.4)
Eczema/other skin disease	1.3 (0.9, 1.9)	1.9 (0.9, 3.9)	1.4 (0.7, 3.0)	0.7 (0.3, 1.4)	2.4 (1.2, 4.8)
Gastrointestinal disease	3.1 (2.2, 4.2)	2.2 (1.0, 5.3)	2.4 (1.2, 5.1)	6.3 (3.7, 10.8)	2.0 (1.0, 3.7)
Urinary incontinence	1.9 (1.4, 2.8)	0.5 (0.05, 4.8)	2.9 (1.4, 6.2)	1.6 (0.8, 3.3)	1.7 (1.0, 2.9)
Renal disease	3.0 (1.3, 6.8)	4.3 (0.8, 21.7)	1.5 (0.3, 7.7)	2.2 (0.4, 13.3)	12.8 (1.7, 95.8)
Neurological disease	7.2 (4.4, 11.9)	9.3 (3.4, 25.5)	9.5 (3.9, 23.3)	4.5 (1.5, 13.9)	6.4 (2.1, 20.2)
Depression	8.1 (5.8, 11.2)	8.1 (4.1, 16.1)	5.2 (2.0, 13.4)	9.7 (5.5, 16.9)	7.7 (3.8, 15.6)
Other disease[b]	6.6 (5.1, 8.6)	9.3 (5.4, 15.9)	3.8 (2.0, 7.1)	8.4 (5.5, 12.8)	7.2 (3.8, 13.9)

All ORs are multivariate, i.e., adjusted for other diseases listed in the table.

[a] Adjusted also for age group and gender.

[b] Excluding the diseases mentioned above and allergic reactions in eyes or nose, non-allergic disease in respiratory system, blood disease and disease of the thyroid gland.

Table 3
Associations (odds ratios and 95% confidence intervals) between symptoms and poor self-rated health, adjusted for chronic diseases

	All[a]	Men		Women	
Age group	35–79	35–64	65–79	35–64	65–79
N	4861	1422	990	1619	830
Symptoms:					
Shoulder/neck pain	1.5 (1.1, 2.1)	1.6 (0.9, 2.9)	1.5 (0.7, 3.2)	0.9 (0.5, 1.5)	3.0 (1.4, 6.5)
Back pain	1.8 (1.4, 2.4)	1.9 (1.0, 3.3)	2.8 (1.3, 5.9)	1.6 (0.9, 2.8)	2.2 (1.0, 4.6)
Pain in limbs	1.7 (1.3, 2.4)	2.1 (1.2, 3.7)	1.6 (0.8, 3.3)	2.2 (1.2, 4.0)	1.1 (0.5, 2.4)
Tiredness/weakness	6.2 (4.4, 8.6)	4.3 (2.3, 7.9)	5.9 (2.7, 12.6)	14.6 (6.2, 34.5)	7.7 (3.3, 18.1)
Sleeplessness	1.5 (1.1, 2.0)	1.2 (0.6, 2.3)	1.4 (0.6, 3.2)	1.5 (0.8, 2.7)	1.4 (0.7, 2.7)
Melancholy	1.8 (1.2, 2.6)	1.3 (0.6, 2.8)	2.7 (0.9, 7.8)	2.7 (1.3, 5.7)	1.0 (0.4, 3.0)
Other symptoms[b]	2.0 (1.4, 2.9)	4.6 (2.1, 9.7)	1.9 (0.7, 5.0)	1.5 (0.8, 2.8)	1.1 (0.4, 2.9)

All ORs are multivariate, i.e., adjusted for diseases listed in Table 2 and the other symptoms listed in Table 3.
[a]Adjusted also for age group and gender.
[b]Excluding the symptoms mentioned above and migraine, headache, stomach pain, and anxiety.

sion and other non-specified diseases had a larger contribution among the middle-aged than among the elderly.

4. Discussion

Many chronic diseases have a strong association with poor self-rated health in the individual, but they may be rare in the total population, especially among younger adults. Therefore their contribution to the total burden of poor self-rated health may be limited. In our population of middle-aged and elderly men and women, tiredness/weakness had the strongest association with self-rated health at population level. The contribution of depression and musculoskeletal pains to the burden of poor self-rated health was also large due to their high prevalence in the population. This implies that prevention concentrated on these conditions would have the largest effect on the total burden of poor self-rated health and its consequencies such as poor quality of life and use of health care services.

Chronic diseases such as depression, neurological disease, rheumatoid arthritis, and cancer were strongly related with poor self-rated health in those individuals affected by them. From a population perspective, chronic diseases, except depression, did not have large contributions to self-rated health among the middle-aged whereas among the elderly, especially among women, the contribution of chronic diseases was large.

Several studies have previously investigated the effect of chronic diseases and symptoms on self-rated health. Those which have investigated the relationship at the individual level have attained different results depending on the conditions included in the study. For example, in two studies in the general adult population, heart disease, chronic lung problems or asthma, and diabetes were found to have a large impact on health perceptions [8,17]. Our results are more in agreement with a related study [18] where gastrointestinal conditions, cerebrovascular/neurologic conditions, renal disease, and musculoskeletal conditions were found to lead to the most adverse quality of life among patients with chronic diseases. Our results also support the finding that depression is associated with poor self-rated health independent of physical illness [23].

What is considered as "good health" varies between individuals. The interpretation of self-rated health also vary by age and gender [11–13]. For example, men have been found to associate poor health more often with limited functional capacity, whereas for women the presence of painful symptoms is more important [24]. Only few studies have investi-

Table 4
Percentage of prevalence of poor self-rated health that can be attributed to chronic diseases and symptoms (population attributable risks)[a]

	All	Men		Women	
Age group	35–79	35–64	65–79	35–64	65–79
Chronic diseases:					
Cancer	8	5	15		18
Diabetes	5	7		4	12
CVD	11	11	18		30
Rheumatoid arthritis	13	9	9	12	27
Asthma	5		4	5	11
Eczema/other skin disease					7
Gastrointestinal disease	8	3	6	20	7
Urinary incontinence	3		7		7
Renal disease	1				3
Neurological disease	9	13	16	3	8
Depression	23	20	9	30	24
Other disease[b]	28	34	14	39	27
Symptoms:					
Shoulder/neck pain	14				42
Back pain	19	18	32		31
Pain in limbs	18	23		30	
Tiredness/weakness	59	43	52	83	66
Sleeplessness	9				
Melancholy	10			24	
Other symptoms[c]	6	14			

[a]Note that the prevalences of these diseases and symptoms overlap and therefore the population attributable risks cannot be summed up but should be considered as relative.
[b]Excluding the diseases mentioned above and allergic reactions in eyes or nose, non-allergic disease in respiratory system, blood disease and disease of the thyroid gland.
[c]Excluding the symptoms mentioned above and migraine, headache, stomach pain and anxiety.

gated possible differences between age groups concerning the effect of chronic diseases and symptoms on self-rated health. Jylhä et al. [19] found that self-rated health was best explained by symptoms and physical fitness in young (31–35 years) men, by symptoms and mental well-being in middle-aged (51–55 years) men, and by chronic diseases in elderly (71–75 years) men. These results are in agreement with ours in that chronic diseases seem to be more important for self-rated health among the elderly than among younger persons, and that depression was important among the middle-aged.

The study of Hoeymans et al. [20] is to our knowledge the only one which has looked at the contribution of chronic conditions to self-rated health both at the individual and population levels. Their study population comprised elderly men. Among them they found that stroke had the strongest impact on self-rated health in individuals, whereas respiratory symptoms and musculoskeletal complaints had the largest contribution in the population. They did not include measures of mental conditions in their study. In addition, they did not include such diseases as urogenital diseases, gastrointestinal diseases, and renal disease because they considered the prevalence of these diseases too low in the population of elderly men. Whereas Hoeymans et al. used one broad category for respiratory diseases, we included only asthma in our study, and it did not have a large contribution to self-rated health. Our results concerning musculoskeletal symptoms are, however, in agreement with their results. In our study, stroke was not given as a separate disease on the questionnaire, and it is not known whether those who have suffered from stroke included it in the category of cardiovascular diseases or in neurological diseases. Based on the findings of Hoeymans et al. [20] and Sprangers et al. [18], and the strong association between neurological diseases and poor self-rated health in our study, it is likely that most of those with stroke have included it in the category of neurological diseases. The results of both the study of Hoeymans et al. and our study underline the fact that even though chronic diseases are important determinants of self-rated health in individuals, common symptoms contribute more to the total burden of poor self-rated health in the general population.

The information on chronic diseases and symptoms was self-reported in our study. The specificity of these measures may not be high. It is, for example, unknown what kind of diseases the categories "other diseases" and "other symptoms" mainly consist of. This would be important to know, especially as the category "other diseases" had a substantial contribution to self-rated health at the population level among the middle-aged. From the literature it is known that the agreement between self-reported chronic diseases and information from general practitioners or hospital records is fair to good, depending on the type of disease [25–27]. In general, agreement is higher for cardiovascular diseases and diabetes, and lower for less serious or unstable diseases such as respiratory problems, back pain, and arthritis. The validity of self-reported mental disorders has been reported to be rather poor [27], but the agreement between self-reported antidepressant medication and physician-reported antidepressant medication has been found to be substantial [28].

Tiredness/weakness was the symptom that explained the largest part of poor self-rated health in the population in our study. The association between tiredness/weakness with self-rated health is complex, because tiredness/weakness can be both a cause of poor self-rated health and a consequence of poor objective health. For example, many different diseases such as cancer, multiple sclerosis, fibromyalgia, and depression cause fatigue. In addition, many psychosocial factors are associated with fatigue [29–30]. However, not all who feel tired or weak report having poor health, as the prevalence of tiredness/weakness is higher than self-rated poor health. There is some evidence that tiredness may predict mortality independent of other diseases [31]. Also in our study, tiredness/weakness was related to self-rated health independent of chronic diseases and other symptoms. In addition, the prevalence of tiredness/weakness was higher than the summed prevalence of diseases that can cause it, indicating that a considerable part of tiredness/weakness is not caused by diseases. There was a dose-response relationship between tiredness/weakness and self-rated health with a very high risk of poor self-rated health among those who reported suffering from tiredness/weakness practically all the time during the last three months. This effect was likewise independent of other diseases and symptoms. Tiredness/weakness seems therefore important to be taken into account when studying determinants of self-rated health.

The strength of our study is that it covers a wide range of chronic diseases and symptoms and is based on a relatively large population sample of both men and women covering an age range from 35 to 79 years. Because of a large sample size it was possible to look at differences between age groups and genders and to include conditions that are rare in the general population. Many of the previous studies have only studied the contribution of diseases on self-rated health in men [19–20], have had a very limited age range [20,23], or have not been population-based [18)]. Also, the conditions that have been taken into account vary. For example, tiredness/weakness has not been studied and depression has been omitted from most studies. In addition, most of the studies have looked only at the association at the individual level, whereas we included both the individual and population levels.

The limitations of this study relate to the fact that the studied diseases and symptoms were self-reported, and the validity of some of the questions may not be high. However, it should be kept in mind that self-reporting is the only way to acquire knowledge about symptoms. We looked only at chronic diseases and symptoms, and not at disability which has also been found to be associated with poor self-reported health [20,32]. In addition, the study was cross-sectional and cannot therefore be used for investigating the temporal mechanisms between diseases/symptoms and self-rated health. Even though it is assumed that it is the physical conditions that affect self-rated health, the relationships may not be entirely unidirectional.

Although the response rate was relatively high in our study, the respondents have been found to have slightly higher educational level, and to be more often married and native Swedes, than the general population. It is therefore likely that the respondents are somewhat healthier than the total population. It is, however, unlikely that the association between diseases/symptoms and self-rated health would differ between the respondents and non-respondents to such an extent that it could vitally affect the results obtained in this study. We also used only two age categories, one covering those who were of working age (35–64 years) and the other covering those retired (65–79 years). In an even larger sample, it would be important to look at narrower age categories to assess possible differences within these broad age categories.

In conclusion, even though many chronic diseases (such as neurological disease, rheumatoid arthritis, and cancer) were strongly associated with poor self-rated health in the individual, symptoms (such as tiredness/weakness and musculoskeletal pains) as well as depression contributed more to the total burden of poor self-rated health in the population because of their high prevalence. The proportion of poor self-rated health that could be attributed to chronic diseases in the population was larger among the elderly compared with the middle-aged. More preventive measures should be directed against symptoms such as tiredness/weakness and musculoskeletal pains as well as depression, especially when these conditions are not consequencies of other diseases, to have an effect on the total burden of poor self-rated health. Prospective studies are recommended to investigate further the association between chronic diseases, symptoms, and self-rated health, in particular the role tiredness/weakness plays in determining self-rated health.

Acknowledgment

The population survey in Värmland was financed by the Värmland County Council.

References

[1] Mossey JM, Shapiro E. Self-rated health: a predictor of mortality among the elderly. Am J Public Health 1982;72:800–8.
[2] Idler EL. Self-rated health and mortality in the NHANES-I epidemiologic follow-up study. Am J Public Health 1990;80:446–52.
[3] Wannamethee G, Shaper AG. Self-assessment of health status and mortality in middle-aged British men. Int J Epidemiol 1996;25:259–65.
[4] Kaplan GA, Goldberg DE, Everson SA, Cohen RD, Salonen R, Tuomilehto J, Salonen J. Perceived health status and morbidity and mortality: evidence from the Kuopio Ischaemic Heart Disease Risk Factor Study. Int J Epidemiol 1996;20:239–45.
[5] Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. J Health Soc Behav 1997;38:21–7.
[6] Helmer C, Barberger-Gateau P, Letenneur L, Dartigues JF. Subjective health and mortality in French elderly women and men. J Gerontol B Psychol Sci Soc Sci 1999;54:S84–92.
[7] Ware JE, Sherbourne CD. The MOS 36-items short form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473–83.
[8] Stewart AL, Greenfield S, Hays RD, Wells K, Rogers WH, Berry SD, McGlynn EA, Ware Jr. JE. Functional status and well-being of patients with chronic conditions. Results from the Medical Outcomes Study. JAMA 1989;262:907–13.
[9] Blaum CS, Liang J, Liu X. The relationship of chronic diseases and health status to the health services utilization of older Americans. J Am Geriatr Soc 1994;42:1087–93.
[10] Miilunpalo S, Vuori I, Oja P, Pasanen M, Urponen H. Self-rated health status as a health measure: the predictive value of self-reported health status on the use of physician services and on mortality in the working-age population. J Clin Epidemiol 1997;50:517–28.
[11] Krause NM, Jay GM. What do global self-rated health items measure? Med Care 1994;32:930–42.
[12] Idler EL. Age differences in self-assessment of health: age changes, cohort differences, or survivorship? J Gerontol 1993;48:S289–300.
[13] Jylhä M, Guralnik JM, Ferrucci L, Jokela J, Heikkinen E. Is self-rated health comparable across cultures and genders? J Gerontol B Psychol Sci Soc Sci 1998;53:S144–152.
[14] Manderbacka K, Lundberg O, Martikainen P. Do risk factors and health behaviours contribute to self-rating of health? Soc Sci Med 1999;48:1713–20.
[15] Cott CA, Gignac MA, Badley EM. Determinants of self rated health for Canadians with chronic disease and disability. J Epidemiol Community Health 1999;53:731–6.
[16] Shadbolt B. Some correlates of self-rated health for Australian women. Am J Public Health 1997;87:951–6.
[17] Lyons RA, Lo SV, Littlepage BNC. Comparative health status of patients with 11 common illnesses in Wales. J Epidemiol Community Health 1994;48:388–90.
[18] Sprangers MA, de Regt EB, Andries F, van Agt HM, Bijl RV, de Boer JB, Foets M, Hoeymans N, Jacobs AE, Kempen GI, Miedema HS, Tijhuis MA, de Haes HC. Which chronic conditions are associated with better or poorer quality of life? J Clin Epidemiol 2000;53:895–907.
[19] Jylhä M, Leskinen E, Alanen E, Leskinen AL, Heikkinen E. Self-rated health and associated factors among men of different ages. J Gerontol 1986;41:710–7.
[20] Hoeymans N, Feskens EJ, Kromhout D, van den Bos GA. The contribution of chronic conditions and disabilities to poor self-rated health in elderly men. J Gerontol A Biol Sci Med Sci 1999;54:M501–506.
[21] Eriksen HR, Svendsrod R, Ursin G, Ursin H. Prevalence of subjective health complaints in the Nordic European countries in 1993. Eur J Public Health 1998;8:294–8.
[22] Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic research: Principles and quantitative methods. New York: Van Nostrand Reinhold Company, 1982.
[23] Mulsant BH, Ganguli M, Seaberg EC. The relationship between self-rated health and depressive symptoms in an epidemiological sample of community-dwelling older adults. J Am Geriatr Soc 1997; 45:954–8.
[24] Kumpusalo E, Pekkarinen H, Neittaanmäki L, Penttilä I, Halonen P. Identification of health status dimensions in a working-age population: an exploratory study. Med Care 1992;30:392–9.
[25] Osler M, Schroll M. The agreement between self-reported data on chronic diseases and a national register of patients. Eur J Public Health 1992;2:113–6.
[26] Kriegsman DMW, Penninx BWJH, van Eijk JTM, Boeke AJP, Deeg DJH. Self-reports and general practitioner information on the presence of chronic diseases in community dwelling elderly. A study on the accuracy of patients' self-reports and on determinants of inaccuracy. J Clin Epidemiol 1996;49:1407–17.
[27] Heliovaara M, Aromaa A, Klaukka T, Knekt P, Joukamaa M, Impivaara O. Reliability and validity of interview data on chronic diseases. The Mini-Finland Health Survey. J Clin Epidemiol 1993;46: 181–91.
[28] Cotterchio M, Kreiger N, Darlington G, Steingart A. Comparison of self-reported and physician-reported antidepressant medication use. Ann Epidemiol 1999;9:283–9.
[29] Watt T, Groenvold M, Bjorner JB, Noerholm V, Rasmussen NA, Bech P.

Fatigue in the Danish general population: influence of sociodemographic factors and disease. J Epidemiol Community Health 2000;54:827–33.

[30] Bensing JM, Hulsman RL, Schreurs KM. Gender differences in fatigue: biopsychosocial factors relating to fatigue in men and women. Med Care 1999;37:1078–83.

[31] Avlund K, Schultz-Larsen K, Davidsen M. Tiredness in daily activities at age 70 as a predictor of mortality during the next 10 years. J Clin Epidemiol 1998;51:323–33.

[32] Idler EL, Russell LB, Davis D. Survival, functional limitations, and self-rated health in the NHANES I Epidemiologic Follow-up Study, 1992. First National Health and Nutrition Examination Survey. Am J Epidemiol 2000;152:874–83.