

Causes of ill health among a random sample of old and very old people: possibilities for prevention

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Reducing handicap among the elderly is becoming a priority as the impact of increased life expectation is felt. Prevention of handicap by maintenance of activity, weight control, anti-smoking programmes, increased incomes, or more accurate targeting of services may all have a role in the prevention of handicap [1]. Such prevention relies heavily on an understanding of the causes of disease derived from studies of people of working age [2-4]. It is likely that relationships between risk factors and disease will alter amongst the old and very old. It is essential that the associations between potentially alterable risk factors and disease occurrence are measured before attempts are made to reduce handicap. This will help decide what potential benefits (if any) might be produced by specific activities and may indicate an order of priority. We therefore examined the relationships between ill-health and socio-economic status, smoking, Quetelet's index, and physical activity.

Methods

Data were obtained from the initial prevalence survey of a longitudinal project designed to measure relationships between well-being, customary physical activity and physical capacity in old age. Random samples of 747 old (65-74) and 852 very old (75+) people living in their own homes were drawn from patient records of 25 general practitioners working within a geographically defined area of Nottingham. Full methodological details have been published [5].

A structured and validated interview lasting from half to two hours was used [6]. This included questions on activity, use of services, socio-economic status, smoking, symptoms of hearing and visual impairment, mobility,

cognitive impairment, mood, urinary incontinence, falls, arthritis, dizziness, headache, heart trouble, stomach trouble, foot trouble, breathlessness, and angina. Interviews were conducted by trained female interviewers. Questionnaires were coded and then analysed using the SPSS-X computer programme [7].

Results

Of 633 subjects aged 65-74 and 666 aged 75 and over who could be contacted, 507 and 535 respectively agreed to be interviewed, giving response rates of 80 per cent for both age groups. Response details have been reported [5].

Table 1. Percentages of elderly people with problems (Numbers of subjects in brackets).

Problem	Men		Women	
	65-74 (n = 221)	75 + (n = 181)	65-74 (n = 283)	75 + (n = 347)
Immobility	3.6 (8)	11.6 (21)	5.0 (14)	13.5 (47)
Fall in last year	20.4 (45)	28.7 (52)	41.3 (117)	40.9 (142)
Incontinence of urine	8.1 (18)	18.2 (33)	18.7 (53)	20.8 (72)
Cognitive impairment	2.3 (5)	6.1 (11)	2.5 (7)	10.7 (37)
Depression	5.9 (13)	5.5 (10)	12.7 (36)	10.4 (36)

The major problems of old age are shown in Table 1. Cognitive impairment (including borderline impairment) was defined as an Information/Orientation CAPE score of less than 10 out of 12 [8], and depression as a score of six or more together with a score of greater than three on the depression sub-scale of the Symptoms of Anxiety and Depression scale [9].

The associations of socio-economic and health behaviour variables and specific problems of old age (ie falls, incontinence, immobility, cognitive impairment, depression) were examined. Younger (65-74) women were more likely to be depressed if living in council rather than private owner-occupied housing ($p < 0.02$). Surprisingly,

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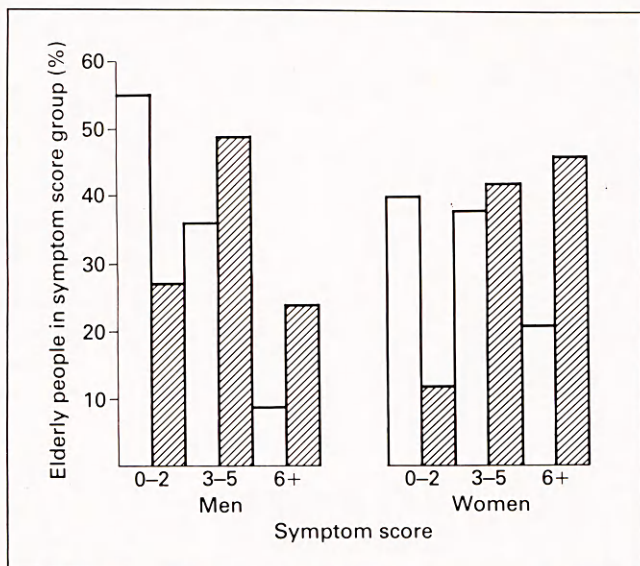


Fig. 1. Self-rated changes in physical activity over the past five years according to symptom score groupings. □ More or as active as 5 years before survey; ▨ less active than 5 years before survey. Percentages are of subjects experiencing a range of symptom score broken down by their self-reported changes in physical activity. Chi-square = 39.9 (dof 4), $p < 0.0001$ for men; 74.0 (dof 4), $p < 0.0001$ for women.

cognitive impairment among men was more common in those who had never smoked than in either current or ex-smokers (65–74 years, $p = 0.022$; 75+ years, $p = 0.043$). Among women, cognitive impairment was not related to smoking habit. No other associations between these specific problems and social class, smoking, Quetelet's index and housing type were found. Reported symptoms and problems (listed in the methods section) were combined into an additive scale. The reliability of the scale was assessed by examining the correlation between individual items and total score. Items with correlations below 0.2 were removed. The final scale ranged from zero to 15 and had a Cronbach's alpha coefficient of 0.61 which indicates satisfactory scaling [7]. Symptom scale scores were normally distributed.

Increasing symptom scores were strongly associated with decreasing physical activity over the previous five years (Fig. 1), and with an estimate of time spent walking on the day prior to interview (Fig. 2).

Men living in privately owned houses had much lower symptom scores than council house dwellers, whereas women in council homes had only a small (though not statistically significant) excess of symptoms over private home dwellers (Fig. 3). Old age was associated with more symptoms among both men and women. Despite this association between symptoms and age, and between age and living alone, men living on their own also had far fewer symptoms than men living with someone.

Discussion

Although this study achieved a favourable response rate compared with many other studies of elderly people [10–

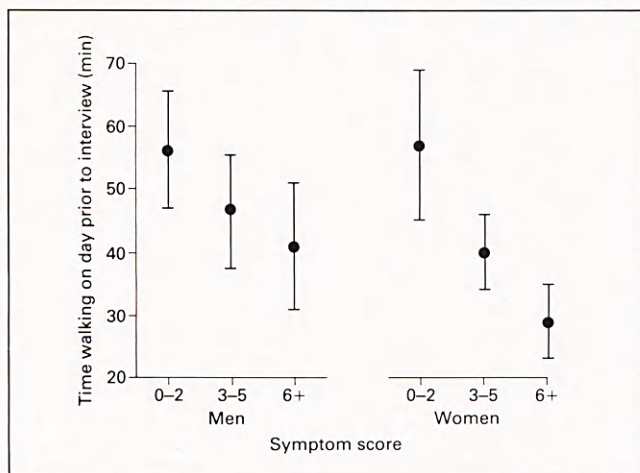


Fig. 2. Minutes spent walking on the day prior to interview according to symptom score groupings. The bars represent 95% confidence intervals. Significance was tested using ANOVA, $p < 0.01$ for both men and women.

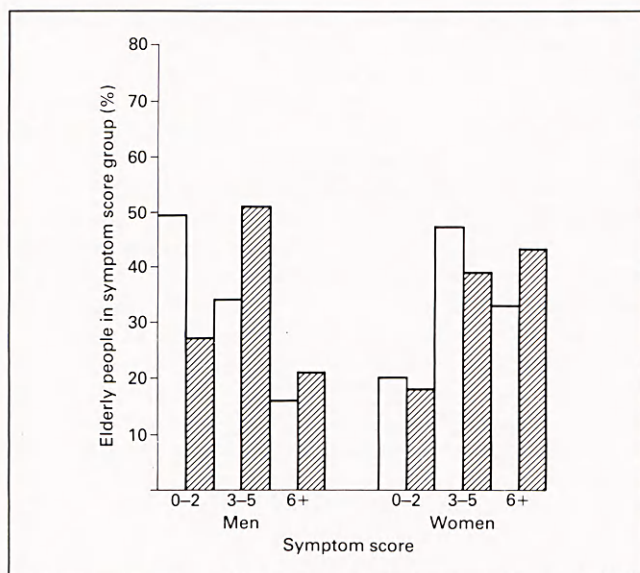


Fig. 3. Relationships between housing tenure and symptom score groupings. □ Owner occupiers; ▨ council tenants. Percentages are of subjects experiencing a range of symptom score broken down by their housing tenure. Chi-square = 18.6 (dof 4), $p < 0.001$ for men; 8.1 (dof 4), $p = 0.09$ for women.

14], it is still possible that response bias has occurred. It is difficult to predict whether responders will be more or less healthy than non-responders. A comparison of the prevalence of problems found in our study with studies that achieved virtually complete coverage [15–18] suggests that major bias (in terms of over or under-representation of the healthy) has not occurred [5].

The most frequently reported causes of handicap were joint pain and stiffness, deafness and foot troubles. While there is little doubt that elderly people get more than their

fair share of analgesics and non-steroidal anti-inflammatory drugs to combat arthritis, little attention has been given to alternatives to drug therapy. The high levels of drug use may themselves be the cause of symptoms such as dizziness and stomach trouble. Some symptoms may not be caused by inflammatory joint disease but merely by lack of use, and might be alleviated or prevented by regular exercise. The assessment and provision of aids for the deaf and the limited availability of chiropodists, although well known problems, have low priority.

Smoking was not associated with symptoms or specific problems [19, 20]. Many of those who suffered from smoking related disease will have died already and, among those developing such disease in old age, high case fatality among smokers may lead to their selective loss from a cross-sectional study. The negative association of smoking with cognitive impairment is novel and may be explained by survival and residence in the community of non-smokers rather than a protective effect of smoking. However, the numbers of subjects with cognitive impairment were small and included those with borderline impairment, thus the observation may be spurious. An American case-control study of Alzheimer's disease aetiology did not find any association with smoking, but 40 per cent of the cases were under 70 years of age and therefore less typical of the subjects in our study [21]. Attempts to reduce smoking (and weight) beyond the age of 65 are probably misplaced. Prevention of exposure to these health hazards must begin in childhood and adolescence and will lead to benefits in later life.

In our elderly subjects, social class was not associated with symptom score whereas at younger ages social class is strongly related to mortality and morbidity [3]. Housing tenure is frequently used as a socio-economic indicator and usually shows similar relationships to social class [3]. We found that male private owner-occupiers had fewer symptoms than council tenants. Women showed similar trends which just failed to reach statistical significance at the 5 per cent level. Similar proportions of old and very old lived in private and council housing, so differences in age structure cannot account for the differences in symptoms. Differences in quality of housing (eg damp, central heating, location), past occupational background, effectiveness of health and social services, or in health related behaviour (eg seeking medical care, diet, regular exercise) may be responsible for the excess of symptoms reported by council tenants. Further examination of the health and well-being of private and council householders will be necessary to decide which of these factors is most relevant in explaining this difference in symptoms.

We found strong relationships between symptom score and self-reported changes in activity levels over the previous five years and in comparison with peer groups. Time spent walking on the day before the interview

showed a similar relationship with symptom score. Obviously a cross-sectional study cannot determine with certainty whether people become less active because of symptoms or whether less activity leads to more symptoms. The levels of walking measured in our survey together with reported participation in other activities suggest that most subjects take far less exercise than their physical capacity allows. Other studies which have shown that a decline in physical activity occurs on leaving school, in the 30s and on retirement [4], also indicate that these reductions are socially rather than medically determined. Further longitudinal study and intervention experiments with elderly people will help establish the extent to which maintenance of physical activity is associated with good health.

Acknowledgement

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