

ORIGINAL ARTICLES

Sleep in Relation to Somatic Health, Mental Health and Pain

R. Asplund, M.D., S.U. Marnetoft, M.D.,
J. Selander M.D., and B. Åkerström M.D.

The present study, a questionnaire survey, was undertaken to assess the influence of somatic health, mental health, pain and age on sleep in a group of men and women. The survey comprised 1948 randomly selected persons (47.7% men) of ages 20-64 years. Poor somatic health was reported by 12.5% of the men and 15.3% of the women and poor mental health by 8.7% of the men and 10.6% of the women. Among the men very good sleep was reported by 34.7% and rather good, rather poor and very poor sleep by 52.8%, 10.9%, and 1.6%, respectively. The corresponding frequencies in women were 32.7%, 51.9%, 12.9% and 2.5%, respectively (NS). No or very light pain was reported by 50.7% of the men and rather light, rather severe or very severe pain by 35.7%, 12.0%, and 1.6%, respectively. The corresponding frequencies in women were 48.1%, 35.4%, 14.1% and 2.4%, respectively (NS). A forward stepwise regression analysis showed that in men, more severe sleep disturbances were associated with poorer mental health ($R^2=0.227$), pain ($R^2=0.292$) and poorer somatic health ($R^2=0.304$). Correspondingly, more severe sleep disturbances were associated with poorer somatic health ($R^2 = 0.218$), poorer mental health ($R^2=0.280$) and pain ($R^2=0.326$) in women. Age, education, being gainfully employed and income were deleted by the regression model in both sexes. It is concluded that poor mental health exerts the most detrimental influence on sleep in men, somatic health in women, and that age does not independently affect sleep at all. (**Sleep and Hypnosis 2004;6(4):148-154**)

Key words: age, education, employment status, mental health, pain, sleep, somatic health

INTRODUCTION

Poor sleep is a common complaint in adults, especially in elderly people (1,2). Among the elderly, sleep disturbances are more

From Family Medicine Stockholm, Karolinska Institute, SE-141 83 Huddinge (Dr. Asplund), Centre for Studies on National Social Insurance, Mid Sweden University, SE-831 25, Östersund (Drs. Marnetoft and Selander), and Department of Nursing and Health Sciences SE-831 25, Mid Sweden University, Östersund (Dr. Åkerström) Sweden.

Address reprint requests to: Dr. Ragnar Asplund, Tallvägen 3
S-833 34 STRÖMSUND, Sweden
Phone: Int +46-670-100 07
Fax: Int +46-63-16 56 26
e-mail: r.asplund@telia.com or ragnar.asplund@jll.se

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common in women than in men at all ages and increase with age in both sexes (3).

A number of different constitutional factors and habits are associated with sleep impairment, for example obesity, coffee-drinking, smoking and alcohol consumption (4-7). Sleep complaints are also increased in association with many somatic diseases and symptoms, such as cerebrovascular diseases, heart diseases, stroke, cancer, diabetes and painful conditions in the musculo-skeletal system (2,8-10). Mental disorders, also are often accompanied by poor sleep. For example sleep impairment is one of the main diagnostic

criteria of major depression (11).

In a previous study among 6,321 elderly men and women of ages 73.9 ± 6.3 [mean \pm standard deviation]) and 74.5 ± 6.8 years, respectively, it was found that poor sleep was determined more by somatic health than by mental health in both sexes, and that increasing age was not associated with any increase in sleep impairment when the influence of somatic health and mental health had been taken into account (3).

The aim of the present study was to evaluate the influence of somatic health, mental health, pain and age on sleep in a group of men and women.

MATERIALS AND METHODS

In September 2003 a postal questionnaire with an explanatory letter was sent to the following groups of randomly selected men and women of ages 20-64 years: 500 in each of three small, sparsely populated municipalities in northern Sweden, namely Härjedalen, Strömsund and Åre with 11,059, 13,293 and 9,635 inhabitants respectively on the 1st of November 2003; 500 in the city of Östersund (58,324 inhabitants); and 1000 in Stockholm, the capital of Sweden (one of the municipalities of Sweden, with 761,949 inhabitants).

Those who had not replied within two weeks were sent a reminder, those who had not replied after two further weeks received a second reminder with another copy of the questionnaire, and those who had not replied after two weeks after this reminder received a final reminder after another two weeks.

Questionnaire

The questionnaire consisted of questions on age and sex, somatic and mental health, sleep, bodily pain, employment status, education and income. The somatic health was considered as "Good" if the statement "My somatic health is ...:" was answered "Very good" or "Rather

good", among the response alternatives "Very good" or "Rather good", "Rather poor", and "Very poor"; and "Poor" if it was answered "Rather poor", or "Very poor". The statement "My mental health is ... ::" was handled accordingly. Bodily pain was considered as "Slight" if described as "No or very slight" or "Rather slight" and "Severe" if described as "Rather severe", or "Very severe".

Statistical analyses

Group comparisons of non-numerical data were made with the chi-square test. Multivariate analysis was performed by forward stepwise regression analysis.

RESULTS

The questionnaire was initially sent to 3,000 individuals. Seventeen questionnaires were returned after having not been filled in. It was initially completed by 1,425 persons. After reminders, a further 523 answers were received. Thus there were 1,948 evaluable questionnaires (men 47.7%). Of the number of recipients who could be expected to answer (2,987 individuals) the response rate was 65.2%. There was no sex difference in the age distribution (Table 1).

Table 1. The percentage age distribution of the men and women in the study group.

	Age (years)			
	20 - 29	30 - 44	45 - 59	60 - 64
Men	14.7	37.1	36.8	11.3
Women	16.8	33.8	39.4	10.1

Among the men, 29.2% had completed nine-year school education, 43.7% upper secondary school and 27.1% had university education. The corresponding frequencies in women were 22.9%, 38.2% and 37.9%, respectively ($p < 0.0001$). Longer education, being gainfully employed and having a higher income were all associated with more favourable reports on

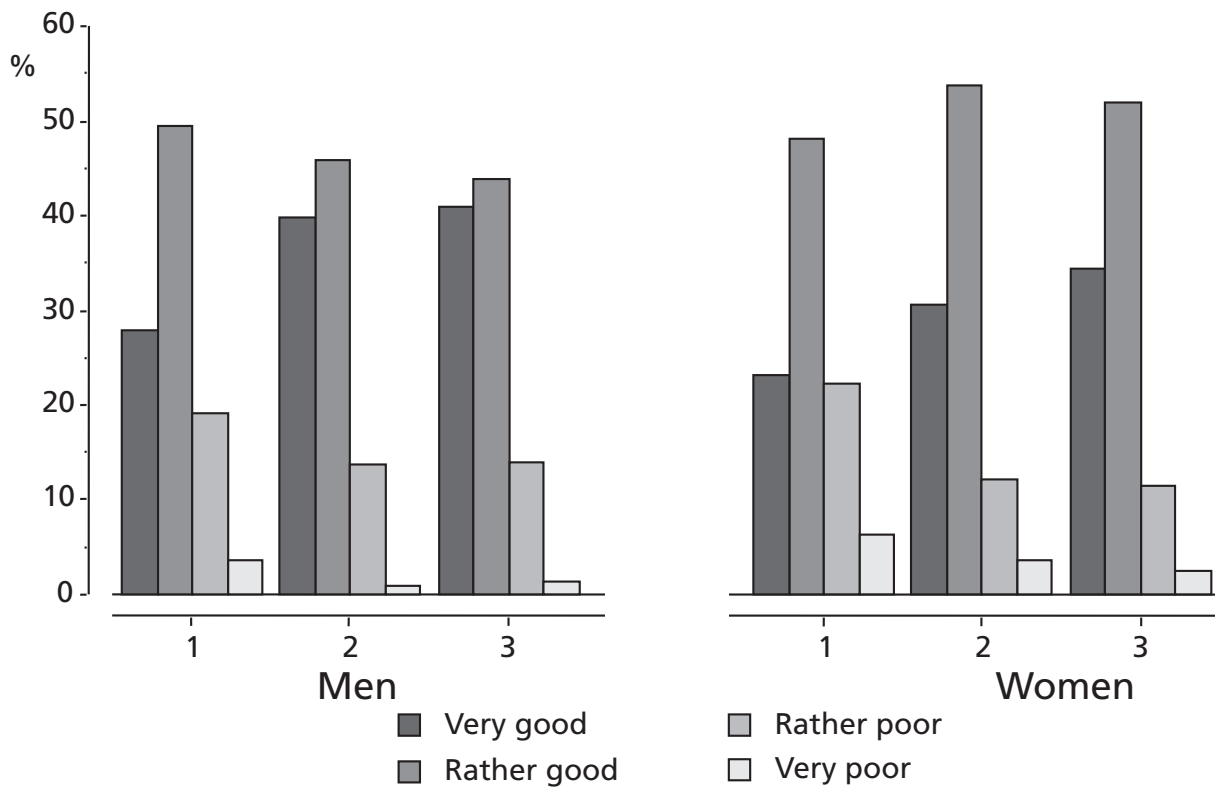


Figure 1. The distribution of sleep reports in relation to education; nine-year compulsory school (1), upper secondary school (2) and university (3) in men (left group of bars; $p < 0.01$) and women (right group of bars; $p < 0.001$).

sleep in both men and women (Figs. 1-3). The most common areas of occupation in men were industry (16.0%), trading (8.8%) and farming and forestry (6.0%), and in women re-school and school (16.1%), health care (14.7%) and geriatric care (19.9%).

Sleep

Of the men, very good sleep was reported by 34.7% of the men and rather good, rather poor or very poor sleep by 52.8%, 10.9%, and 1.6%, respectively. The corresponding frequencies for women were 32.7%, 51.9%, 12.9% and 2.5%, respectively (NS). Reports on poor sleep increased with increasing age in both men ($p < 0.05$) and women ($p < 0.001$).

Somatic and Mental Health

Poor somatic health was reported by 12.5% of

Table 2. The percentage numbers of men and women reporting different grades of somatic and mental health, in the whole study population.

	Very good	Rather good	Rather poor	Very poor
<i>Somatic health</i>				
Men	34.6	52.9	10.9	1.6
Women	32.7	51.9	12.9	2.5
<i>Mental health</i>				
Men	42.5	48.8	7.4	1.3
Women	38.2	51.2	8.9	1.7

the men and 15.3% of the women and poor mental health by 8.7% of the men and 10.6% of the women. There was no sex difference in the distribution of different grades of somatic or mental health (Table 2). Reports on poor somatic health increased with increasing age in both men ($p < 0.0001$) and women ($p < 0.0001$), while the proportion of unfavourable reports on mental health was unaffected by age in both sexes. Mental health deteriorated with declining

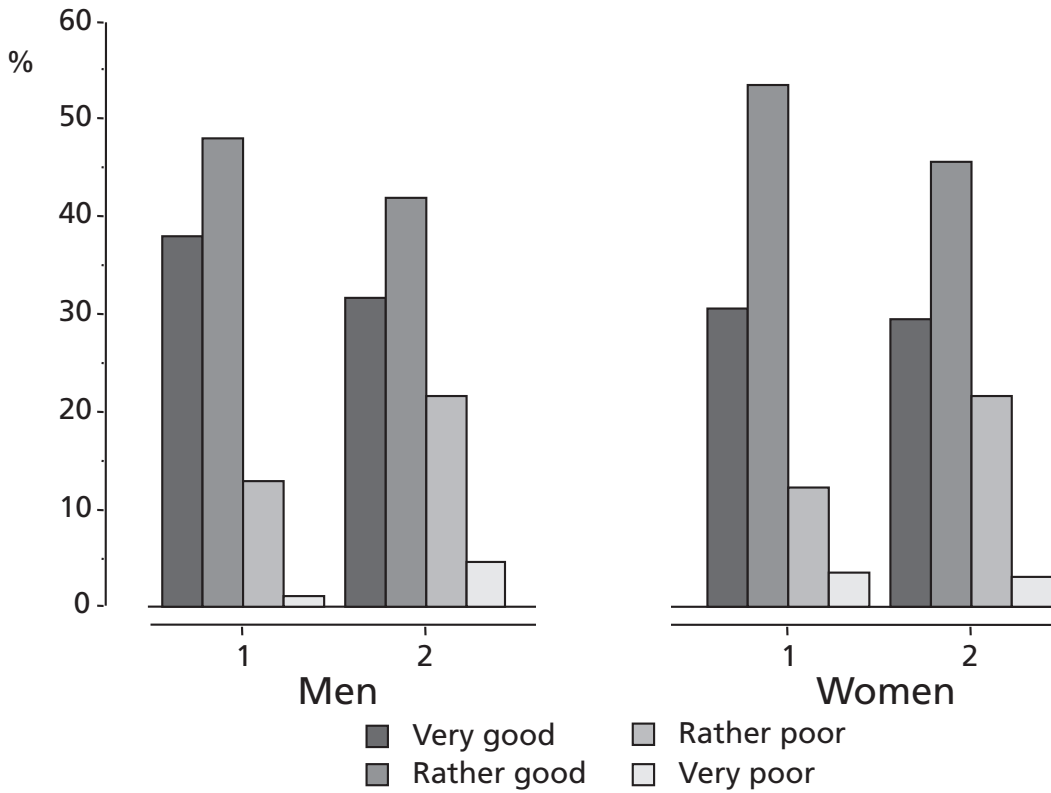


Figure 2. The distribution of sleep reports in relation to employment status; gainfully employed (1), unemployed (2) in men (left group of bars; $p < 0.001$) and women (right group of bars; $p < 0.05$).

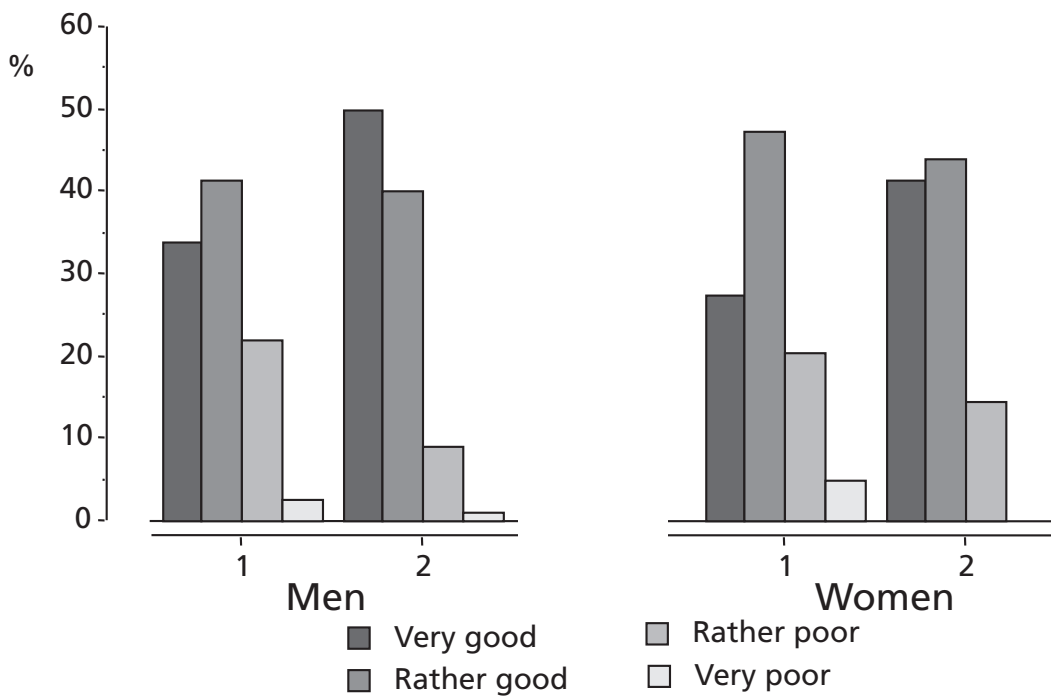


Figure 3. The distribution of sleep reports in relation to monthly income; <12,000 Swedish crowns, SEK (1), 30,000 SEK (2) in men (left group of bars; $p < 0.05$) and women (right group of bars; $p < 0.05$).

Table 3. The percentage numbers of men and women reporting poor somatic health, poor mental health and severe pain in relation to sleep in the whole study population.

	Sleep				p =
	Very good	Rather good	Rather poor	Very poor	
Poor somatic health					
Men	3.2	10.5	34.8	68.8	< 0.0001
Women	2.4	10.9	42.1	64.9	< 0.0001
Poor mental health					
Men	1.9	5.4	30.0	62.5	< 0.0001
Women	2.4	6.1	31.4	54.1	< 0.0001
Severe bodily pain					
Men	4.1	13.3	31.8	68.8	< 0.0001
Women	3.5	12.6	40.1	73.0	< 0.0001

somatic health in both men ($r^2=0.495$; $p<0.0001$) and women ($r^2=0.484$; $p<0.0001$). Poor somatic and mental health increased in parallel with worse reports on sleep in both men and women (Table 3).

Bodily Pain

No or very slight pain was reported by 50.7% of the men and rather slight, rather severe or very severe pain by 35.7%, 12.0% and 1.6%, respectively. The corresponding frequencies in women were 48.1%, 35.4%, 14.1% and 2.4%, respectively (NS). Reports on poor sleep increased by increasing age in both men ($p<0.0001$) and women ($p<0.0001$), and it also increased in parallel with increasingly poor sleep in both sexes (Table 3). Among the men severe pain occurred in 28.1% of those with nine-year compulsory school education, in 6.5% of those with upper secondary school education and in 8.8% of those with university education ($p<0.0001$), and the corresponding figures in women were 29.4%, 14.0% and 10.1%, respectively ($p<0.0001$).

Regression Analyses

A forward stepwise regression analysis showed that in men, more severe sleep disturbances were associated with poorer mental health ($R^2=0.227$), pain ($R^2=0.292$) and poorer

somatic health ($R^2=0.304$). In women, more severe sleep disturbances were associated with poorer somatic health ($R^2=0.218$), poorer mental health ($R^2=0.280$) and pain ($R^2=0.326$). Age, education, gainful employment and income were deleted by the regression model in both sexes.

DISCUSSION

This questionnaire study showed that somatic health, mental health and pain were all associated with sleep complaints. This is in accordance with previous findings (12).

The occurrence of sleep problems was more often related to mental health than to somatic health in men, while the reverse was found in women. In the previously mentioned study in elderly men and women, somatic health was a stronger determinant of sleep in both sexes than was mental health (3). The observation that sleep in women was more strongly related to somatic health than to mental health is surprising, as sleep impairment is often looked upon as a manifestation, or a result of, psychiatric disorders, and as women are more troubled than men by both sleep impairment and mental ill health (13,14).

One somatic condition specifically referable to women, with profound influence on sleep, is the menopausal transition (15). Subjective quality of sleep is influenced by climacteric

symptoms, such as hot flushes, sweating and palpitations, and sleep is improved when these symptoms are alleviated by oestrogen replacement therapy (5,15). Sleep impairment and cardiac health are also inter-related. In a prospective study of women of ages <65 years who were treated in hospital for coronary heart disease and subsequently followed up for five years, it was shown that poor sleep was associated with a 2.5 (1.2-5.2) increased risk for recurrent cardiac events (16).

Some sleep-disturbing conditions are more prevalent in women than in men. Periodic limb movement disorder is 90% more prevalent and restless legs syndrome 50% more prevalent in women than in men (17).

Many of the women in the present study were engaged in occupational areas with irregular work hours or shift work, such as health care or geriatric care. Sleep impairment is more prevalent in women with shift work or irregular working hours than in those with regular working hours (18). In Sweden there has been an increase in the work intensity and stress in these occupational areas in recent years in parallel with a restricted social economy and increasing numbers of elderly people in the population with a need for health care. High work demands and physical effort at work are both risk indicators for disturbed sleep (19).

The prevalence of pain showed no significant sex difference. This was not expected, as the prevalence of many painful conditions such as fibromyalgia, rheumatoid arthritis and chronic musculo-skeletal pain are 2-7 times more prevalent in women than in men (20-22). The univariate analysis showed that the occurrence of bodily pain increased in both men and women in parallel with increasing sleep deterioration. In the stepwise regression analysis pain was included as the second most sleep-influencing factor in men

(after mental health) but as the third factor in women (after somatic and mental health).

Pain showed similar prevalence rates in the different sleep groups in men and women (Table 3). There was also a similar pain distribution in men and women at the different educational levels, but the educational level was lower in men. Six per cent more men than women had only completed nine-year compulsory school education while ten per cent more women than men had received university education (Figure 1). One explanation for the seemingly different impacts of pain on sleep in men and women in the multiple regression analysis might be that a higher proportion of the men (with reference to their level of education) had more heavy blue-collar work such as farming, forestry and building, while a greater proportion of the women had less physically strenuous work in office environments, for example. This is consistent with previous findings that pain is associated with difficulty in physical activity and is associated with an increased risk for sick-leave and for loss of employment, income and financial security (20,23,24).

Unemployment and a low income were associated with an increased occurrence of sleep impairment in both sexes (Figures 2 and 3). Unemployment might disturb sleep as a consequence of difficulty in retaining the 24-hour rhythm when regular work is lacking (25), and the ability to earn an income is associated with the educational level, health and consequently sleep (26).

In summary, in men sleep problems were related more to mental health than to pain and in the third place to somatic health, while the succession of correlates in women was: somatic health, mental health and pain. Age, education, income and employment status did not independently influence on sleep either in men or in women.

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