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Prescription and non-prescription medicine use in Denmark: association with socio-economic position

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Abstract *Objective*: To analyse the association among different types of medicine use and different measures of socio-economic position (SEP) in one and the same general population.
Methods: Data from The Danish Health and Morbidity Survey 2000 were analysed. The survey was conducted by face-to-face interviews with a representative sample of the adult Danish population ($n = 16{,}690$). The associations between prescription and over-the-counter (OTC) medicine use and education, occupation and income were assessed by logistic regression analyses. All analyses were adjusted for age, gender and two measures of health status.
Results: This cross-sectional analysis of medicine use in a large representative sample of the Danish population found greater use of prescription medicines among disability pensioners and "others" than in salaried employees. Disability pensioners and self-employed individuals used less OTC medicine than salaried employees. Individuals with low income used more prescription medicines but not more OTC medicines, than those with high income. No major differences were found in prescription medicine use with respect to education, but men within the two middle educational groups tended to use prescription medicine less frequently than both lower and higher educated men. A similar trend was not found for women. OTC medicine use was not associated with education for either gender.
Conclusions: The prevalence of prescription medicine use increases with declining SEP, after adjusting for health status. Such an association does not exist for OTC medicine use. The results show that the least affluent have access to prescription medicine. The difference between prescription and OTC medicine use may be explained by a compensation mechanism.

Keywords Socio-economic position · Prescription medicine · Over-the-counter medicine

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Introduction

It is well documented that health problems are more frequent among the lower social classes than among the more prosperous part of the population [1] and that medicine use and health status are closely associated [2, 3]. Medicine expenses can be considerable for the individual user and a barrier to access to medicine. Therefore, an important question is whether social differences are present in medicine use.

Greater use of medicine can be expected in the lower social classes than the higher social classes, considering the skewed distribution of health problems and the close association between medicine use and health status. Hence, it is crucial to adjust for health status when investigating associations between medicine use and socio-economic position (SEP).

Many studies have analysed delimited aspects of the association of SEP (measured as, for example, education, job position and income) with medicine use. The results are inconsistent and difficult to compare due to differences in time and place, inclusion of different and often small and specific population groups, different

measurements of medicine use and different measurements of SEP. Furthermore, the organisational structure of health care systems, including insurance and reimbursement aspects, influence the results of these kinds of studies. In this article, only studies adjusting for health status in the analyses are discussed.

To our knowledge, only two publications, from Norway, have analysed the association between self-reported medicine use and SEP in a general population, adjusting for health status [4, 5]. One of the studies found no association between medicine use and SEP as measured by education [4], whereas the other study found a high education level to be a weak but significant predictor of medicine use among men [5].

A Dutch study based on a non-representative sample of the population found small and insignificant social differences in prescription medicine use, after controlling for health status. The tendency was that prescription medicine use increased with decreasing educational level [2].

Other studies dealing with specific population groups, for example, the elderly, found no overall association between medicine use and SEP [6, 7]. A common feature of these published studies is that they do not distinguish between use of prescription medicine and over-the-counter (OTC) medicine and, in addition, apply only one measure of SEP. Two ecological studies found an inverse association between prescription medicine use and SEP [8, 9]. However, one study focusing on prescription analgesic use found no social differences [10]. Another study dealing with the use of two specific groups of medicine among Swedish women aged 45 years and older found no association between use of antihypertensive medicines and education; whereas use of hormone replacement therapy was related to increasing education [11].

Very few studies have analysed OTC medicine use in relation to SEP. In the Netherlands, OTC medicine use was found to be associated with higher education in a non-representative sample of the population [2]. One American study found that use of OTC medicine was associated with higher education among the elderly [12], and one study found higher income to be associated with OTC medicine use in general [13]. Use of OTC analgesics was associated with higher SEP among men in a Swedish study [10].

The results from the published reports show that it is important not only to adjust for health status but also to distinguish between prescription medicine and OTC medicine when investigating the association of medicine use with SEP. Hence, there is a need to study the relationship between different types of medicine use and different measures of SEP in a general population.

The objective of this study was to investigate the associations between different types of medicine use and different measures of SEP in one and the same large representative sample of a general population. Data from the Danish Health and Morbidity Survey were analysed for this purpose.

Materials and methods

Setting

The Danish health care sector is mainly financed by public taxes and is characterised by free access to general practitioners and hospital care for all residents [14]. Expenditures on pharmaceuticals in hospitals are fully paid by the public, whereas pharmaceutical expenditure in the primary health care sector is subject to different levels of individual co-payment [14]. Individual annual pharmaceutical expenditure is reimbursed at the following levels: below 72 euro (1 USD or 1 Euro corresponds to approximately 7.5 DKK)—no reimbursement; 72–173 Euro—50% reimbursement; 173–406 Euro—75% reimbursement; over 406 Euro—85% reimbursement [15]. In this way, medicines are reimbursed to a greater extent for people with a high level of medicine use than for those with a low level. Chronically and terminally ill persons, pensioners and persons with low income can get their reimbursement for pharmaceutical expenditures increased [14]. Prescription medicines only are eligible for reimbursement and OTC medicines are generally not reimbursed. However, if prescribed, certain OTC medicines may be reimbursed for pensioners and chronically ill people [14].

Study

Data were derived from the cross-sectional Danish Health and Morbidity Survey 2000. A random sample of 22,486 Danish citizens aged 16 years and above was drawn from the Central Personal Register. The sample was stratified to include at least 1000 respondents from each of the 14 Danish counties. A total of 16,690 persons participated, resulting in a response rate of 74.2%. The data were collected in three waves during February, May and September 2000. The respondents were interviewed in their homes by trained interviewers. The response rate was similar for men and women, but elderly women had a relatively low response rate (60.8%). Widowed men and married men had a relatively high response rate compared with other marital status groups. Persons living in the Copenhagen capital area had a relatively low response rate compared with other parts of Denmark (65.5% and 76.3%, respectively) [16]. Despite the unequally distributed non-response, the respondents are estimated to be representative of the Danish population [16].

Measurements

Medicine use was measured in different ways in the survey. Three measures of medicine use were analysed for this article. Regular use of medicine was measured by the item: ''Do you regularly or continuously take any medicine?'' Respondents who answered ''yes'' to the question were included as users. The question covered prescription medicine as well as OTC medicine, but not vitamins, minerals and oral contraceptives (which were specified by the interviewer).

Use of prescription medicine within 14 days was measured by the question: ''Have you taken any of the following medicines within the past 2 weeks?'' followed by a list of specific therapeutic groups. Those who answered ''yes'' to the question about medicine use for at least one of the specified therapeutic groups were included as users. A similar question was asked about the use of over-the-counter medicine within 14 days.

Socio-economic position was measured by occupation, education and personal income. Occupation was coded in six groups: self-employed, salaried employee, worker, unemployed, disability pensioner and others. Others included housewives, long-term sick listed, conscripts and individuals receiving welfare benefits. Old-age pensioners, individuals aged 60–66 years on early retirement allowance, pupils and students were omitted from the analyses.

These groups are primarily defined by their age and consist of heterogeneous persons on their way to or retired from very different occupations.

Education was coded by the ISCED (International Standard Classification of Education) [17], which includes a combination of school education and education. In this article, four groups of education are applied: short (maximum 10 years of schooling), medium (11–12 years of schooling), long (13–14 years of schooling), further long (15+ years of schooling).

Personal income for 1 year was divided into three levels: low (< 150,000 DKK), medium (150,000–< 300,000 DKK), high (> 300,000 DKK) (US $1 or 1 Euro corresponds to approximately 7.5 DKK).

These groups were chosen with respect to the level of income in Denmark and to ensure a suitable number of respondents in each group. Individuals not answering the question on personal income (5.6%) and individuals with no personal income (1.3%) were omitted from the analyses. Adjustments were made for gender, age and health status, as they are known to be strongly associated with medicine use [18].

Health status was measured by two health measurements: the presence or non-presence of chronic disease and self-perceived general health. Self-perceived general health was measured at five levels: really good, good, fair, bad and very bad. In the analyses, two levels of self-perceived general health were used: good (really good and good) and less than good (fair, bad, very bad).

Statistical analyses

Bivariate associations were conducted for each pattern of use. Differences between proportions were tested by χ^2-tests and described by crude odds ratios. Logistic regression was applied to analyse the association between medicine use and SEP. The analyses were carried out separately for each measurement of medicine use combined with each measurement of SEP, nine different analyses in total. In the first model, we adjusted for gender and age; chronic disease and self-perceived general health were added in the second model. This was done to follow the influence of the added variables on medicine use from model to model. All variables except age were included as categorical variables. Age was included as a continuous variable. The significance level was set to 0.05. Tests for interaction were performed for SEP in combination with the other independent variables. Interactions were considered significant with a P value less than 0.01. The respondents were weighted with respect to county, but not for age or non-response.

With respect to income and education, the highest groups were chosen as reference groups. When including occupation in the analyses, the reference group was chosen with respect to size and prevalence of medicine use. The group of salaried employees is large and has relatively low prevalence of medicine use.

In analyses including personal income or occupation, individuals aged 25–66 years only were included, as people outside this interval are unlikely to have an occupation, due to being retired or studying. In the analyses on associations with education, respondents below 25 years of age were omitted, as a large share of these persons are students. The analyses were performed using the Statistical Analysis System statistical package, version 8.

Results

Medicine use in relation to gender, age and health is described first, and the associations between medicine use and SEP are then presented for each measure of SEP. The results from analyses of regular medicine use resembled in all ways the results concerning prescription medicine use within 14 days. To simplify the presentation of the results, we, therefore, decided not to show the results of the analyses of regular medicine use.

Association of medicine use with gender, age and health

The proportion of medicine users increased with increasing age among prescription medicine users (χ^2-test, $P < 0.0001$) (Table 1). Age was significantly

Table 1 Prevalence of medicine use (%) and crude odds ratios (OR) by gender, age, self-perceived health and chronic disease. *CI* confidence interval

	Prescription medicine use within 14 days			Over-the-counter medicine use within 14 days		
	n	%	OR (95% CI)	*n*	%	OR (95% CI)
Total	16,555	34.9	–	16,496	31.1	–
Gender						
	16,555	*		16,496	*	
Men		30.5	1.0		24.5	1.0
Women		39.2	1.5 (1.4–1.6)‡		37.3	1.8 (1.7–2.0)‡
Age (years)						
	16,555	*		16,496	*	
16–24		17.5	1.0		29.4	1.0
25–44		22.6	1.4 (1.2–1.6)‡		33.1	1.2 (1.1–1.3)‡
45–66		39.3	3.1 (2.7–3.5)‡		29.5	1.0 (0.9–1.1)
67+		67.7	9.9 (8.6–11.4)‡		31.3	1.1 (1.0–1.2)
Self-perceived health						
	16,545	*		16,487	*	
Good		25.8	1.0		28.1	1.0
Less than good		66.9	5.8 (5.4–6.3)‡		41.6	1.8 (1.7–2.0)‡
Chronic disease						
	16,552	*		16,493	*	
No		19.1	1.0		27.1	1.0
Yes		57.5	5.7 (5.3–6.1)‡		36.7	1.6 (1.5–1.7)‡

*$P < 0.0001$ in χ^2-test
‡Statistically significant ($P < 0.05$)

Table 2 Prevalence (%) and crude odds ratios of medicine use and within 14 days and the association with occupation examined in logistic regression models. Results expressed as odds ratios (OR) and 95% confidence intervals (CI)

	Prevalence (%)	Crude OR (95% CI)	OR (95% CI) adjusted for age and gender	OR (95% CI) adjusted for age, gender and two measures of health status
Prescription medicine use				
Occupation	$P < 0.0001$*	$P < 0.0001$†	$P < 0.0001$†	$P < 0.0001$†
Salaried employee§	24.8	1.0	1.0	1.0
Self-employed	24.3	1.0 (0.8–1.1)	0.9 (0.8–1.1)	0.8 (0.7–1.0)
Worker	23.9	1.0 (0.8–1.1)	1.0 (0.9–1.2)	0.9 (0.8–1.1)
Unemployed	34.7	1.6 (1.3–2.0)‡	1.6 (1.3–2.0)‡	1.1 (0.9–1.4)
Disability pensioner	74.6	8.9 (7.5–10.5)‡	6.5 (5.4–7.7)‡	2.2 (1.8–2.7)‡
Others	52.5	3.3 (2.8–4.0)‡	2.9 (2.4–3.5)‡	1.4 (1.2–1.8)‡
Over-the-counter medicine use				
Occupation	$P < 0.0001$*	$P < 0.0001$†	$P < 0.0001$†	$P = 0.0044$†
Salaried employee§	32.0	1.0	1.0	1.0
Self-employed	23.2	0.6 (0.6–0.8)‡	0.8 (0.7–0.9)‡	0.7 (0.6–0.9)‡
Worker	28.7	0.9 (0.8–1.0)‡	1.0 (0.9–1.1)	0.9 (0.8–1.0)
Unemployed	35.6	1.2 (1.0–1.4)	1.1 (0.9–1.4)	1.0 (0.8–1.2)
Disability pensioner	36.5	1.2 (1.1–1.4)‡	1.3 (1.1–1.6)‡	0.8 (0.7–1.0)‡
Others	37.7	1.3 (1.1–1.6)‡	1.2 (1.0–1.5)‡	0.9 (0.7–1.1)

*χ^2-test
†Walds χ^2-test
‡Statistically significant ($P < 0.05$)
§Indicates reference group

associated with use of OTC medicine (χ^2-test, P value < 0.0001), although no systematic trend was observed. Respondents between the ages of 25 years and 44 years were most likely to use OTC medicine. For both types of medicine use, women used medicine to a wider extent than men. Respondents with indication of poor health (presence of chronic disease and self-perceived general health less than good) were more likely to use medicine. This applied for both types of medicine use (Table 1).

Association of medicine use with occupation

Prescription medicine use was directly associated with occupation (χ^2-test, $P < 0.0001$; Table 2). The highest proportions of prescription medicine users were found among respondents excluded from the labour market. Occupation was also associated with prescription medicine use after adjusting for age and gender by logistic regression (Table 2), but the odds ratios for use between the occupational groups were lower than those in the bivariate analyses. The two health status measurements were added to the logistic regression analysis in the final model. Table 2 shows that prescription medicine use was also associated with occupation in this model (Walds χ^2-test, $P < 0.0001$). The highest odds ratios for prescription medicine use were found among disability pensioners and the group of ''others''. For all occupational groups, the adjustment for health status resulted in decreased odds ratios for use compared with the model adjusting solely for age and gender.

OTC medicine use was directly associated with occupation (χ^2-test, $P < 0.0001$), although the differences in proportions were less than for prescription medicine use (Table 2). In the final model adjusting for age, gender and two measures of health status, OTC medicine use was associated with occupation (Walds χ^2-test, $P = 0.0044$; Table 2). Self-employed and disability pensioners used OTC medicines less often than the reference group.

Association of medicine use with income

Prescription medicine use was directly associated with income (χ^2-test, $P < 0.0001$). The highest proportions of users were found within the lowest earning income group (Table 3). Income was associated with prescription medicine use after adjusting for age and gender by logistic regression (Table 3). The two health status measurements were added to the logistic regression model in the final model. Table 3 shows that use of prescription medicines was associated with income (Walds χ^2-test, $P = 0.0003$). The highest odds ratio for prescription medicine use was found in the lowest income group. For all income groups, the adjustment for health status resulted in decreased odds ratios for use compared with the model adjusting solely for age and gender.

OTC medicine use decreased with increasing income (χ^2-test, $P < 0.0001$) (Table 3). However, in contrast to prescription medicine use, income was not associated with OTC medicine use after adjustment for age, gender and two measures of health status (Walds χ^2-test, $P = 0.4949$; Table 3).

Table 3 Prevalence (%) and crude odds ratios of medicine use and within 14 days and the association with income examined in logistic regression models. Results expressed as odds ratios (OR) and 95% confidence intervals (CI)

	Prevalence (%)	Crude OR (95% CI)	OR (95% CI) adjusted for age and gender	OR (95% CI) adjusted for age, gender and two measures of health status
Prescription medicine use				
Income	$P<0.0001$*	$P<0.0001$†	$P<0.0001$†	$P=0.0003$†
Low	44.8	2.6 (2.3–2.9)‡	2.2 (1.9–2.4)‡	1.2 (1.1–1.4)‡
Medium	27.2	1.2 (1.1–1.3)‡	1.2 (1.0–1.3)‡	1.0 (0.9–1.1)
High§	23.8	1.0	1.0	1.0
Over-the-counter medicine use				
Income	$P<0.0001$*	$P<0.0001$†	$P=0.0001$†	$P=0.4949$†
Low	36.1	1.7 (1.5–1.9)‡	1.3 (1.2–1.5)‡	1.1 (0.9–1.2)
Medium	32.1	1.4 (1.3–1.6)‡	1.1 (1.0–1.3)‡	1.1 (1.0–1.2)
High§	25.2	1.0	1.0	1.0

*χ^2-test
†Walds χ^2-test
‡Statistically significant ($P<0.05$)
§Indicates reference group

Table 4 Prevalence (%) and crude odds ratios of prescription medicine use within 14 days and the association with education for men and women in logistic regression models. Results expressed as odds ratios (OR) and 95% confidence intervals (CI)

	Prevalence of prescription medicine use (%)	Crude OR (95% CI)	OR (95% CI) adjusted for age	OR (95% CI) adjusted for age, gender and two measures of health status
Men				
Education	$P<0.0001$*	$P<0.0001$†	$P<0.0001$†	$P=0.0037$†
Short, maximum 10 years	44.5	2.0 (1.7–2.3)‡	1.4 (1.2–1.6)‡	1.0 (0.8–1.2)
Medium, 11–12 years	36.6	1.4 (1.2–1.7)‡	1.1 (0.9–1.2)	0.8 (0.7–0.9)‡
Long, 13–14 years	23.9	0.8 (0.7–0.9)‡	0.9 (0.8–1.1)	0.8 (0.7–1.0)‡
Further long, 15+ years†	28.6	1.0	1.0	1.0
Women				
Education	$P<0.0001$*	$P<0.0001$†	$P<0.0001$†	$P=0.3113$†
Short, maximum 10 years	55.1	2.7 (2.3–3.1)‡	1.4 (1.2–1.6)‡	1.0 (0.9–1.2)
Medium, 11–12 years	48.9	2.1 (1.8–2.4)‡	1.4 (1.2–1.7)‡	1.2 (1.0–1.4)
Long, 13–14 years	32.4	1.0 (0.9–1.2)	1.1 (1.0–1.3)	1.1 (0.9–1.2)
Further long, 15+ years†	31.6	1.0	1.0	1.0

*χ^2-test
†Walds χ^2-test
‡Statistically significant ($P<0.05$)
§Indicates reference group

Association of medicine use with education

The results of these analyses are presented separately for men and women due to a significant interaction between gender and education ($P=0.0001$, results not shown). The direct association between prescription medicine use and education was significant for both men and women (χ^2-test, both P values <0.0001); the lowest educated groups had the highest proportions of medicine users (44.5% of men and 55.1% of women, respectively). Prescription medicine use was associated with education for both genders, after adjusting for age (Table 4). After adjusting for health status, a gender difference appeared in the association between medicine use and education (Table 4). Use of prescription medicines was associated with education among men (Walds χ^2-test, $P=0.0037$), but not among women ($P=0.3113$). Men with 11–12 years and 13–14 years of education used less prescription medicine than those with less or more years of education (Table 4).

OTC medicine use and education were not associated. No trend in prevalence was found for either gender (χ^2-test, $P=0.4008$ for men and $P=0.7364$ for women, respectively; Table 5). No association appeared after adjustment for age, gender and two measures of health status for either gender.

Gender and the two measures of health status were of significant importance for medicine use in all the logistic regression analyses (results not shown). Women were most likely to be medicine users. This was also the case for individuals with chronic disease and self-perceived general health less than good. Regular medicine use and prescription medicine use increased with increasing age, whereas this was not the case for OTC medicine use (results not shown).

Discussion

The key finding of this study was that social differences in medicine use exist in the general Danish population for prescription medicine use but not for OTC medicine use. Population groups with lower socio-economic position had the highest use of medicine. This was valid for prescription medicine use, when occupation or income were included as measurement for SEP. Using education as SEP measure showed no gradient for women; whereas

Table 5 Prevalence (%) and crude odds ratios of over-the-counter (OTC) medicine use within 14 days and the association with education for men and women in logistic regression models. Results expressed as odds ratios (OR) and 95% confidence intervals (CI)

	Prevalence of OTC medicine use (%)	Crude OR (95% CI)	OR (95% CI) adjusted for age	OR (95% CI) adjusted for age, gender and two measures of health status
Men				
Education	$P = 0.4008$*	$P = 0.4010$†	$P = 0.3911$†	$P = 0.3637$†
Short, maximum 10 years	26.1	1.0 (0.9–1.2)	1.1 (0.9–1.2)	0.9 (0.8–1.1)
Medium, 11–12 years	24.3	1.0 (0.8–1.1)	1.0 (0.8–1.1)	0.9 (0.7–1.0)
Long, 13–14 years	23.8	0.9 (0.8–1.1)	0.9 (0.8–1.1)	0.9(0.8–1.0)
Further long, 15+ years†	25.3	1.0	1.0	1.0
Women				
Education	$P = 0.7364$*	$P = 0.7369$†	$P = 0.1270$†	$P = 0.7088$†
Short, maximum 10 years	38.4	1.1 (0.9–1.2)	1.2 (1.0–1.4)‡	1.0 (0.9–1.2)
Medium, 11–12 years	36.7	1.0 (0.8–1.2)	1.0 (0.9–1.2)	1.0 (0.8–1.1)
Long, 13–14 years	37.8	1.0 (0.9–1.2)	1.0 (0.9–1.2)	1.0 (0.9–1.2)
Further long, 15+ years†	37.0	1.0	1.0	1.0

*χ^2-test
†Walds χ^2-test
‡Statistically significant ($P < 0.05$)
§Indicates reference group

the association for men was curve-linear. In contrast, for all measures of SEP, social differences in OTC medicine use did not seem to exist.

Regular use and prescription medicine use showed a similar pattern with respect to their association with different measures of SEP (results not shown for regular medicine use). This is possibly due to the fact that medicines used regularly tend to be used for longstanding or chronic diseases and these types of diseases are most often treated with medicines prescribed by a physician.

To our knowledge, no previous study has investigated the self-reported general use of medicine in a general population while distinguishing between prescription and OTC medicine use. The differences in prescription medicine use among educational groups found in the Netherlands correspond with the results of this study [2]. The association in the Dutch study was not significant after adjustment for health status. However, it was conducted on a stratified sample over-representing population groups with chronic disease and high as well as low SEP. The findings in two ecological studies of decreasing prescription medicine use with increasing SEP correspond with the results of this study [8, 9]. No association between prescription medicine use and education among women was found in this study. This corresponds with the results on use of antihypertensive medicines in a Swedish study [11]. However, the Swedish study also investigated the association between use of hormone replacement therapy and education among women and found a positive association [11]. Our study also included hormone replacement therapy as a part of prescription medicine, but this particular group of medicines was not examined separately. Differences between studies may be partly explained by differences in the organisational structure of health care systems between countries, including insurance and reimbursement aspects. Our findings should not be extrapolated to countries with different types of health care systems.

Medicine use and education was associated differently for men and women. This gender difference is supported by a Norwegian study in which high education was found to be a weak predictor for medicine use among men, but not women [5]. In this study, no gender differences were found when other measures of SEP were used. Hence, education as a measure of SEP captures another aspect of social position than do occupation and income.

The weak association between OTC medicine use and occupation showed that the self-employed were least likely to use OTC medicine. A Swedish study found that, among men, white-collar workers were more likely to use OTC analgesics than other occupational groups [10]. In a Dutch study, the highest educated were most likely to use OTC medicine [2]. In our study, the salaried employees (both genders) were most likely to use OTC medicine, although not significantly. OTC medicine use and education were not significantly associated in this study, but, for men, the tendency corresponded with the results of the Dutch study [2]. In the United States, higher education and higher income have been associated with OTC medicine use [12, 13]. We do not know why the findings differ, but explanations may lie with differences in health care systems, culture and differences among countries in the type of medicines available over the counter.

In agreement with previous studies, we found that medicine use is more common among women than among men [4, 5, 6, 7, 9,10, 12, 13, 18, 19, 20, 21, 22, 23], and that medicine use increased with increasing age [4, 5, 9, 18, 19, 20, 21, 22, 23, 24, 25, 26]. The gender difference found was consistent for all types of medicine use, while the age gradient persisted only for regular use and use of prescription medicine. Furthermore, it was shown that measures of health status were strongly associated with medicine use. This finding is in agreement with previous studies [2, 4, 5, 6, 7, 9, 10, 12, 13, 18, 19, 20, 21, 22, 23, 24, 25, 26].

One advantage of the present study is that SEP was measured in different ways. How to measure and interpret SEP is an ongoing discussion in the fields of sociology and epidemiology. The three measures of SEP used most often are occupation, education and income [27]. They have all shown importance as health determinants [1]. All measures have advantages and disadvantages and can be interpreted in various ways [1, 27]. Generally, education influences attitudes and knowledge and, therefore, can be taken as a proxy for these. Occupation captures the current living conditions of the individual; whereas, income reflects purchasing power and material living standards. The three measures are usually closely correlated, but the findings in this study showed that the three measures of socio-economic position are differently associated with medicine use.

In a life course perspective, income can be interpreted as a consequence of education and occupation. It has been suggested that income is related to health not so much through its role as a determinant of material living standards, but rather as a marker for social status [28]. In the present study, income is considered to reflect purchasing power. Analyses of the association between medicine use and income are of special relevance when evaluating the function of a health care system.

Our results contribute new knowledge about the association of medicine use with SEP in a general population. Although Denmark is a Nordic welfare state, health inequalities exist [29]. The present study documents that social differences exist in prescription medicine use and regular use of medicine. The associations showed that the least prosperous use medicine most often. This finding demonstrates that the Danish system of co-payment for pharmaceutical expenditure and redistribution of income through taxes works and that the least prosperous have access to medicine, although they use more medicine. This may be due to a compensatory mechanism. In contrast to some other studies [2, 12, 13], we did not find increasing OTC medicine use with increasing SEP. Social differences could be expected when OTC medicines are not reimbursed. It is, therefore, possible that the least prosperous consult a doctor (which is free in Denmark) and get a prescription for medicine when experiencing minor health problems, whereas the more prosperous deal with health problems themselves to a wider extent and use OTC medicine.

Methodological considerations

The analyses in this study were based on cross-sectional data, and the results of the analyses are associations. It is assumed that poor health leads to medicine use. Poor health is closely related to SEP [1], and ongoing theoretical discussions are trying to determine the causality between health and SEP, which is beyond the scope of this article.

The validity of the information provided by the respondents is not known. It has been shown that among Dutch low- and middle-income groups, self-reporting of prescription medicine use within 3 months was good to excellent. Furthermore, concordance between survey and registration data differed little among socio-economic groups [30]. The recall period in this study was 14 days. This might result in even higher validity on recall of prescription medicine than for a 3-month recall period. We are not aware of any literature data on the validity of self-reported OTC medicine use. This would be hard to study, as sales of OTC medicines are not registered at an individual level.

This study was performed with a large national representative sample of a total population and the response rate was satisfying (74.2%). Because of the large study population, even small differences become significant. Some of the significant odds ratios in this study are quite close to 1. In those cases, it is crucial to assess whether the association is important.

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