

The influence of sociodemographic characteristics on health care utilisation in a Swedish municipality

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ABSTRACT

During recent years there has been a debate on factors that might influence health care utilisation, and the possibilities to predict such utilisation in order to facilitate the allocation of health care resources in the community. Currently only the age distribution in the population is usually used for such predictions. In this study the influence of a number of other sociodemographic characteristics on health care utilisation, in addition to age and sex, was assessed in a small Swedish community. A postal questionnaire, containing questions on health care utilisation and a number of sociodemographic factors, was sent to a random, stratified sample of the population of Håbo municipality, Sweden. Out of the sampled 1312 subjects, 827 (63%) responded to the questionnaire. Subjects aged 65 years and above had higher odds for having consulted a physician, having been hospitalised and having a cost limitation card compared to those below age 65. Men had significantly lower odds than women for having consulted a physician, having visited other health care providers and having a cost limitation card. Singles, as compared to married subjects, had lower odds for all health care measures except having consulted a physician. Subjects with sick leave or disability pension, as compared to working subjects, had higher odds for most health care utilisation measures. A number of sociodemographic factors were thus associated with health care utilisation and might be considered in the health care resources allocation process.

INTRODUCTION

Most societies attach great importance to establishing and maintaining a good level of health. This is reflected in the proportion of the gross national product (GNP) allocated to health care. These resources must be used efficiently. Several studies have demonstrated that a rather small proportion of the population accounts for a high percentage of the total health care costs [1–6]. In this context it is of interest to

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study factors that determine health care utilisation in order to achieve optimal planning and organisation of health care resources.

Andersen et al [7] presented a theoretical framework for viewing health care utilisation, in which they emphasized three major groups of health service determinants: individual, health service system and societal determinants. Individual determinants included predisposing, enabling and illness factors. The predisposing factors included demography, social structure and beliefs. This concept has been further developed in a recent doctoral thesis in which the dualism between health care needs and health care utilisation was pointed out [8]. The research area is rapidly progressing, but is still highly controversial. In Sundquist's thesis, based on a very large study population, sociodemographic data available from official registers and referring to the individual as well as to the neighbourhood area, were both shown to affect health care utilisation and needs [8].

The use of alternative medicine, e.g. acupuncture, homeopathy and chiropractic, is usually not considered in studies of health care utilisation. However, the use is widespread and costly for the individual and therefore of interest. It is likely that alternative medicine will play an even greater role in the future due to its popularity among patients and marketing efforts by the providers [9–11].

The present report is based on a comprehensive program (the Causes of Health Care Utilisation Study, CHCUS) to assess sociodemographic characteristics, well-being, symptoms and health care utilisation and the possible relationships between these factors in a representative sample of the population of Håbo. The aim of the study was to evaluate the influence of age, sex and other sociodemographic characteristics on health care utilisation, including use of alternative medicine.

STUDY POPULATION AND METHODS

Setting

This investigation was performed in 1994 among subjects living in the municipality of Håbo, Sweden, which had a population of around 16,500 at that time. The urban centre in Håbo is Bålsta, which is located some 50 kilometres west of Stockholm and south of Uppsala. In 1993, the year studied, the Bålsta Health Centre was the only provider of primary health care. The nearest hospital was located in Enköping, about 30 kilometres from Bålsta.

Approximately one quarter of the population of Håbo was below 16 years of age and only six per cent were aged 65 years or above. The proportion of subjects with a university education in Håbo was slightly less, while the average income was somewhat higher than in Sweden as a whole [12, 13]. About 70% of the working population were commuters, mainly to Stockholm.

Sample

All residents of Sweden have a unique national registration number that includes date of birth and information on sex. Registration numbers, names and addresses of

all residents are recorded by the County Census Bureau in a population register, which must by law be kept up-to-date.

To achieve a sufficient number of subjects in different age groups for this study, a random age-stratified sample of the population of Håbo was drawn, using the population census. A total of 1.500 residents fulfilled the sampling criteria. If several subjects in the same family were sampled, only the oldest was chosen for further investigation. For this reason, 188 younger subjects were excluded and, consequently, the study population consisted of 1.312 persons.

Postal questionnaire

A questionnaire was mailed to the study population, followed by a reminder if necessary. The questionnaire contained questions on sociodemographic variables and health care utilisation during the time period January–December 1993. The sociodemographic variables included, in addition to age and sex, present marital status, number of persons in the household unit, educational level, occupational status and whether the subjects commuted or not.

Measures of health care utilisation included whether or not the subject had visited a physician, other health care providers or a provider of alternative medicine, and hospital admissions. For visits to a physician or a provider of alternative medicine a 6-graded ordinal scale was used (score 1=1 visit, score 2=2 visits, score 3=3 visits, score 4=4–5 visits, score 5=6–10 visits, and score 6=more than 10 visits). Visits to other health care providers were measured as number of visits. Hospital admissions were measured as number of admissions and number of days spent in hospital. Information on whether the subject had a cost limitation card was also collected. The cost for visits to a physician, hospitalisation and medicine was limited to 1.600 Swedish crowns (approximately 270 US\$) in 1993. Patients who had spent this amount of money within in a 12-month period were given a cost limitation card, which entitled them to free health care, with the exception of alternative medicine.

The questionnaire was returned by 827 (63%) subjects. The responders were somewhat older than the non-responders (45 years versus 42 years on average) and there were more women among the responders than among the non-responders (53% versus 42%). A separate analysis in a sub-sample (n=232) indicated that the responders had more contacts with the health care system [14].

The Research Ethics Committee at Uppsala University approved the study.

Statistical methods

The data were analysed with the JMP and SAS programme packages [15, 16]. The partial non-response rate (missing data in returned questionnaires) was less than five per cent. Standard parametric methods were used to obtain summary statistics, such as means and dispersions. The possible relationships between socio-demo-

Table 1. Health care utilization by age and sex.

Age groups	Men						Women						p-value	
	16–24	25–44	45–64	65–74	>74	Total	16–24	25–44	45–64	65–74	>74	Total	Age	Sex
n	101	67	137	62	25	392	106	90	132	60	47	435		
Visit to physician														
n	48	37	72	41	19	219	72	63	102	43	39	326		
%	48	55	53	66	76	56	68	70	77	77	89	75	<0.0001	<0.0001
Mean score	2.06	2.50	2.35	2.39	3.17	2.38	2.31	2.44	2.57	3.18	3.05	2.64	<0.0001	<0.05
Visit to other health care providers														
n	23	26	50	16	8	123	33	62	73	24	16	208		
%	23	39	37	28	32	32	32	70	56	44	43	50	n.s.	<0.0001
Mean no visits	3.7	3.4	5.3	6.8	5.8	4.8	3.1	6.5	5.0	5.1	8.8	5.4	n.s.	n.s.
Hospitalization														
n	6	5	9	13	7	38	7	11	9	12	8	45		
%	7	9	8	26	27	13	7	17	8	26	28	14	<0.0001	n.s.
Mean no of days	4.0	2.6	6.8	6.3	6.7	5.7	2.0	7.0	4.3	6.2	8.9	6.0	<0.05	n.s.
Cost limitation card														
n	3	1	12	9	5	30	4	10	18	15	11	58		
%	3.0	1.6	8.8	17.0	19.0	8.0	3.8	11.2	13.6	27.3	25.6	13.7	<0.0001	<0.05
Alternative medicine														
n	12	20	21	11	4	68	22	22	27	11	4	86		
%	12	30	15	18	16	17	21	24	20	18	9	20	n.s.	n.s.
Mean score	0.94	2.61	1.44	1.30	1.81	1.52	2.12	2.42	1.97	1.75	0.91	1.93	n.s.	n.s.

graphic variables and health care utilisation measures were tested using the logistic regression technique in its multivariate form. Odds ratios (OR) with 95% confidence intervals (95% CI) for health care utilisation by sociodemographic variables were computed, adjusted for the influence of age and sex. For the calculation of OR, the largest subgroup was used as reference.

RESULTS

Univariate analyses

The proportion of subjects who had consulted a physician, or had been hospitalised, or had a cost limitation card during the study year increased with age, Table 1. Of those who had visited a physician, older subjects had seen a doctor more frequently, i.e. had higher visit scores, than young people. Older subjects spent more days in hospital, although the number of hospital admissions was not influenced by age (not shown). Age did not influence the proportion of subjects who had visited other health care providers or a provider of alternative medicine.

A greater proportion of women (75%) than men (56%) had consulted a physician during the study year, and the visit number score was also higher in women, Table 1. In addition, more women than men had visited other health care providers (50% and 32%, respectively) or had a cost limitation card (14% and 8%). The proportions of women and men who had been hospitalised were similar, as were the proportions that had visited a provider of alternative medicine.

The mean number of visits (visit score) to a physician, or other health care

Table 2. Visits to a physician, other health care provider (OHCP) and provider of alternative medicine (AM) by sociodemographic characteristics.

	Popula- tion	Physician			OHCP			AM		
		%	Mean visit score	p	%	Mean no. of visits	p	%	Mean visit score	p
Marital status				n.s.			n.s.			n.s.
Married	500	56	2.58		47	2.40		21	1.97	
Single	228	68	2.29		26	0.97		16	1.52	
Divorced	41	78	2.54		46	1.85		15	1.20	
Widowed	49	81	2.74		51	3.11		15	1.09	
Household size				n.s.			n.s.			n.s.
1 person	105	72	2.62		44	2.02		18	1.39	
2 persons	314	72	2.64		42	2.34		20	1.69	
3 persons	163	57	2.67		40	1.94		18	1.75	
4 persons	238	60	2.18		41	1.57		19	1.98	
Educational level				n.s.			n.s.			n.s.
Comprehensive school only	327	69	2.72		37	2.06		18	1.52	
Vocational school	146	66	2.52		43	1.90		20	2.20	
Higher secondary school	246	61	2.33		42	1.89		18	1.83	
University	97	61	2.28		50	2.18		19	1.71	
Occupational status				<0.0001			<0.001			n.s.
Work	402	63	2.27		48	1.93		19	1.76	
Sick-leave & disabil. pension	40	95	4.87		60	4.91		28	2.79	
Pension	148	78	2.72		36	2.17		18	1.54	
Education	143	53	2.26		19	0.52		17	1.79	
Unemployed & others	62	57	2.46		53	3.81		17	1.57	
Commuting				n.s.			n.s.			n.s.
Yes	332	62	2.45		46	1.93		20	1.75	
No	595	74	2.18		53	1.97		26	2.36	

provider, or a provider of alternative medicine by sociodemographic characteristics is shown in Table 2. Only occupational status influenced the physician visit score or number of visits to other health care provider significantly, i.e. subjects on sick-leave or disability pension had the highest mean visit score (4.87) and mean number of visits (4.91), respectively.

Multivariate analyses

A multivariate analysis of the effects of these factors on health care utilisation is shown in Table 3. When the effect of gender was taken into account, subjects aged 65 years and above had 2.3 times higher odds for having consulted a physician than subjects aged 16–44 years, i.e. the elderly were more than twice more likely to have seen a physician than the youngest group. This increased likelihood was statistically significant, as shown by the 95% CI for the odds ratio (1.5–3.5). The elderly also had significantly higher odds for having been hospitalised and having a cost limitation card than the youngest subjects. Subjects aged 45–64 years also had significantly higher odds for having a cost limitation card than those aged 16–44 years.

Table 3. Odds ratios and their 95% confidence intervals (95% CI) for health care utilization by sociodemographic characteristics in multivariate analyses illustrating the effect of each variable on health consumption with the effect of age and sex taken into account.

	Visit to a physician	Visit to other health care provider	Hospital admission	Cost limitation card	Visits to alternative medicine provider
Age years					
16–44	1.00	1.00	1.00	1.00	1.00
45–64	1.25 (0.90–1.75)	1.33 (0.96–1.85)	0.72 (0.38–1.38)	2.44 (1.33–4.50)	0.83 (0.55–1.23)
65+	2.32 (1.54–3.51)	0.86 (0.59–1.25)	3.16 (1.84–5.45)	5.68 (3.15–10.27)	0.73 (0.46–1.16)
Sex					
Women	1.00	1.00	1.00	1.00	1.00
Men	0.43 (0.32–0.58)	0.46 (0.35–0.62)	0.90 (0.56–1.45)	0.53 (0.33–0.85)	0.85 (0.60–1.21)
Marital status					
Married	1.00	1.00	1.00	1.00	1.00
Single	0.69 (0.46–1.05)	0.25 (0.16–0.39)	0.44 (0.20–0.98)	0.38 (0.15–0.93)	0.60 (0.37–0.97)
Divorced	1.57 (0.72–3.41)	0.90 (0.46–1.76)	0.70 (0.23–2.09)	1.43 (0.59–3.43)	0.90 (0.40–2.02)
Widowed	1.11 (0.49–2.52)	1.07 (0.54–2.15)	1.02 (0.45–2.30)	1.22 (0.56–2.65)	0.61 (0.23–1.57)
Household size					
2	1.00	1.00	1.00	1.00	1.00
1	0.91 (0.54–1.52)	1.07 (0.66–1.72)	1.23 (0.63–2.41)	0.90 (0.47–1.70)	1.16 (0.66–2.05)
3	0.64 (0.41–0.98)	0.85 (0.55–1.30)	2.01 (0.96–4.20)	0.72 (0.35–1.48)	0.76 (0.45–1.29)
4	0.72 (0.46–1.11)	0.91 (0.60–1.39)	1.35 (0.59–3.11)	0.63 (0.28–1.40)	0.72 (0.43–1.21)
Educational level					
Comprehensive school only	1.00	1.00	1.00	1.0	1.00
Vocational school	0.85 (0.55–1.31)	1.51 (1.00–2.29)	1.26 (0.66–2.43)	0.78 (0.41–1.50)	1.56 (0.94–2.59)
Higher secondary school	0.92 (0.62–1.35)	1.33 (0.90–1.96)	1.36 (0.69–2.69)	1.59 (0.82–3.06)	1.45 (0.91–2.33)
University	0.80 (0.49–1.30)	1.86 (1.15–3.00)	1.28 (0.54–3.02)	0.91 (0.41–2.02)	1.37 (0.75–2.47)
Occupational status					
Work	1.00	1.00	1.00	1.00	1.00
Sick-leave & disability pension	3.14 (1.32–7.46)	1.73 (0.87–3.46)	3.14 (1.32–7.46)	8.03 (3.78–17.02)	2.27 (1.08–4.78)
Pension	1.24 (0.53–2.93)	0.72 (0.37–1.40)	1.24 (0.53–2.93)	1.58 (0.68–3.66)	1.72 (0.70–4.22)
Education	0.42 (0.15–1.18)	0.21 (0.12–0.35)	0.42 (0.15–1.18)	0.98 (0.35–2.73)	0.72 (0.42–1.24)
Unemployed & others	0.75 (0.25–2.26)	1.05 (0.59–1.85)	0.75 (0.35–2.26)	1.76 (0.67–4.57)	0.84 (0.41–1.71)
Commuting					
Yes	1.00	1.00	1.00	1.00	1.00
No	0.66 (0.41–1.06)	0.84 (0.54–1.30)	1.91 (0.74–4.88)	1.02 (0.47–2.21)	0.71 (0.43–1.17)

When the effect of age was taken into account men had significantly lower odds than women for having consulted a physician, having visited other health care providers and having a cost limitation card.

After adjustment for the influence of age and sex, singles had significantly lower odds for all types of health care utilisation, except for consulting a physician which ran just short of statistical significance ($p = 0.08$). The odds ratios for the various measures of health care utilisation were not significantly different in divorced or widowed subjects compared to married subjects. Health care utilisation tended to decrease with household size even though it did not reach significance. Education had no influence on health care utilisation with the exception that subjects with a university education had a significantly higher odds ratio for having visited other health care providers than subjects with a comprehensive school education only. As expected, subjects with sick-leave or disability pension had significantly higher

odds for most of the health care utilisation measures than working subjects, and students had significantly lower odds for having visited other health care providers.

DISCUSSION

This population-based study, using multivariate analysis, showed that subjects aged 65 years and above had a higher odds ratio for having consulted a physician, having been hospitalised and having a cost limitation card compared to those below age 65. Men had a significantly lower odds ratio than women for having consulted a physician, having visited other health care providers and having a cost limitation card. Singles compared to married subjects, had lower odds ratios for all health care measures except for having consulted a physician. Subjects with sick leave or disability pension, compared to working subjects, had higher odds ratios for most health care utilisation measures. These characteristics were also related to a high number of consultations with a physician. High age, female sex and sick leave and disability pension were associated with having a cost limitation card, reflecting a general high health care utilisation.

Approximately 20% of the study population had seen a provider of alternative medicine during the study year. This rate appears to be rather high considering the fact that the subjects had to pay the entire cost of such visits. Obviously, they experienced a need of an alternative or a complement to the traditional health care, most likely since they did not feel that they received, or would receive, timely and adequate treatment within traditional health care. Other investigators have reported similar rates for visits to alternative medicine in the United Kingdom and in North America [17, 18].

Several other studies have investigated the influence of age and sex on health care utilisation and the results are generally similar to ours [19–21]. The influence of other sociodemographic variables has not been assessed to the same extent, and the results of the different studies are less consistent. The latter is only to be expected due to national differences regarding study populations and health care systems.

Other investigators have, however, reported findings similar to ours. For example, Joung et al. [22] found that singles utilized the health care system less than other subjects, and Grimsmo et al. [19] observed that educational level had no influence on health care utilisation. Carr-Hill et al. [23] reported that subjects classified as permanently sick as well as unemployed subjects were high consumers of health care.

In our study only subjects on sick leave and disability pension had a higher odds ratio for utilisation of almost all kinds of health care measure than working subjects. Unemployed subjects had no significant increase of utilisation. In contrast to our results, La Vecchia et al. [24] found that the educational level influenced health care utilisation. They reported that less educated subjects were more often hospitalised than better educated ones. Dunlop et al. [25] found that subjects with low income and education visit specialists less than those with moderate or high income or education.

The results of this study can be considered representative of the entire adult pop-

ulation in Håbo, since they were based on an age-stratified random sample. They should also be representative of similar Swedish communities close to the large cities. The results must, however, be interpreted with some caution considering the response rate of 63%. This response rate is, however, not unexpected in view of the experience from similar studies [26–28].

The health care utilisation during the year preceding the survey was recorded. This time period was long enough to allow the recording of a sufficient amount of health care utilisation and short enough to ensure that the subjects remembered most of their health care contacts. Because of this and the cost limitation card, which could be used as a reminder of visits, the recall bias in this study is likely to be of little importance. The results relating to whether visits were made to a physician, other health care provider or a provider of alternative medicine, as well as the data on hospitalisation or a cost limitation card are likely to be more reliable than information on the number of visits or hospitalisations or the number of days in hospital.

The influence of marital status, household size, educational level, occupational status and commuting on health care utilisation was evaluated using multivariate analysis adjusting for the influence of age and sex, which certainly are important determinants of health care consumption [17–20, 29, 30]. In view of the number of analyses performed, the problem of “mass significance” should be considered. The 95% confidence intervals for the odds ratios were rather wide in certain analyses in this study due to the relatively small number of subjects and events. Consequently, the magnitude of the influence of a certain demographic variable cannot be estimated with high precision. For example, subjects with sick leave or disability pension may have as little as 1.32 and as much as 7.46 times a higher odds ratio to have visited a physician than working subjects. Furthermore, a non-significant result in certain analyses does not exclude an effect.

Our findings of relationships/associations indicate that these variables may be used to predict health care utilisation. However, a prospective study is needed to confirm the predictive value. It would have been of great interest to assess the possible influence of ethnic origin on health care utilisation in the present study. This was, however, not possible since the proportion of other ethnic groups than Swedes was low in Håbo in 1993.

In conclusion, this study has provided information on the influence of sociodemographic characteristics on health care utilisation in Håbo, a small Swedish community close to major cities. Obviously, not only age and sex, but also other sociodemographic variables, such as marital status and occupational status, had a significant influence on health care. These findings are likely to be of value in the planning and allocation for health care resources.

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